2025 Range Trend Project Report

# Range Trend Studies 8, 9, 10, 11, 13B, 17B&C

Utah's Big Game Range Trend Studies



Publication Number 26-12 | Federal Aid Project W-82-R-70

*Prepared by the Utah Division of Wildlife Resources*

*Great Basin Research Center*

UTAH DNR WILDLIFE RESOURCES

# Utah Big Game Range Trend Studies
# 2025
# Wildlife Management Units
# 8, 9, 10, 11, 13B, 17B&C


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Navajo Tea (*Thelesperma subnudum*) by Jason Cox (2025)


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Reports for study sites, with accompanying photographs, are available online at http://wildlife.utah.gov/range-trend.html.

# PROGRAM NARRATIVE

State: UTAH

Project Number: W-82-R-70

Grant Name: Utah Wildlife Habitat Research and Monitoring

Project Name: Utah Wildlife Habitat Monitoring

Need: The ability to detect changes in vegetation composition (range trend) on big game winter ranges is an important part of the Division's big game management program. The health and vigor of big game populations are closely correlated to the quality and quantity of forage in key areas. The majority of the permanent range trend studies will be located on deer and elk winter ranges, however on certain management units, studies are located on spring and/or summer ranges, if vegetation composition on these ranges is the limiting factor for big game populations. Range trend data are used by wildlife biologists for habitat improvement planning purposes, reviewing BLM and USFS allotment management plans, and as one of several sources of information for revising deer and elk herd management unit plans. Range trend data may also be gathered where habitat information is necessary for other wildlife species such as Greater sage-grouse.

Purpose: Monitor, evaluate, and report range trend at designated key areas throughout the state, and inform Division biologists, public land managers and private landowners of significant changes in plant community composition in these areas.

Expected Results or Benefits: Range trend studies in each region will be re-monitored every five years, and vegetation condition and trend assessments will be made for key areas. DWR biologists, land management personnel from the USFS and BLM, and private landowners will use the range trend database to evaluate the impact of land management programs on big game habitat and use the information in the development of management plans. Annual reports will be readily available on the Division's website, digitally stored, and in hard copies located in DWR regional offices, BLM and USFS offices, and public libraries. Special studies (habitat project monitoring and big game/livestock forage utilization studies) will give DWR biologists and public land managers' additional information to address local resource management problems.

# REMARKS

The work completed during the 2025 field season and reported in this publication involves the reading of interagency range trend studies in the DWR Northeastern Region. Most trend studies surveyed in these management units were established in the 1980s and reread at 5-year intervals.

The following Bureau of Land Management and U.S. Forest Service offices provided information and/or assistance in completion of the trend studies, which add to the value of this interagency report:

Bureau of Land Management
- Price Resource Area
- Vernal Resource Area
- Moab Resource Area

Ashley National Forest
- Vernal Ranger District
- Roosevelt Ranger District
- Duchesne Ranger District
- Flaming Gorge National Recreation Area

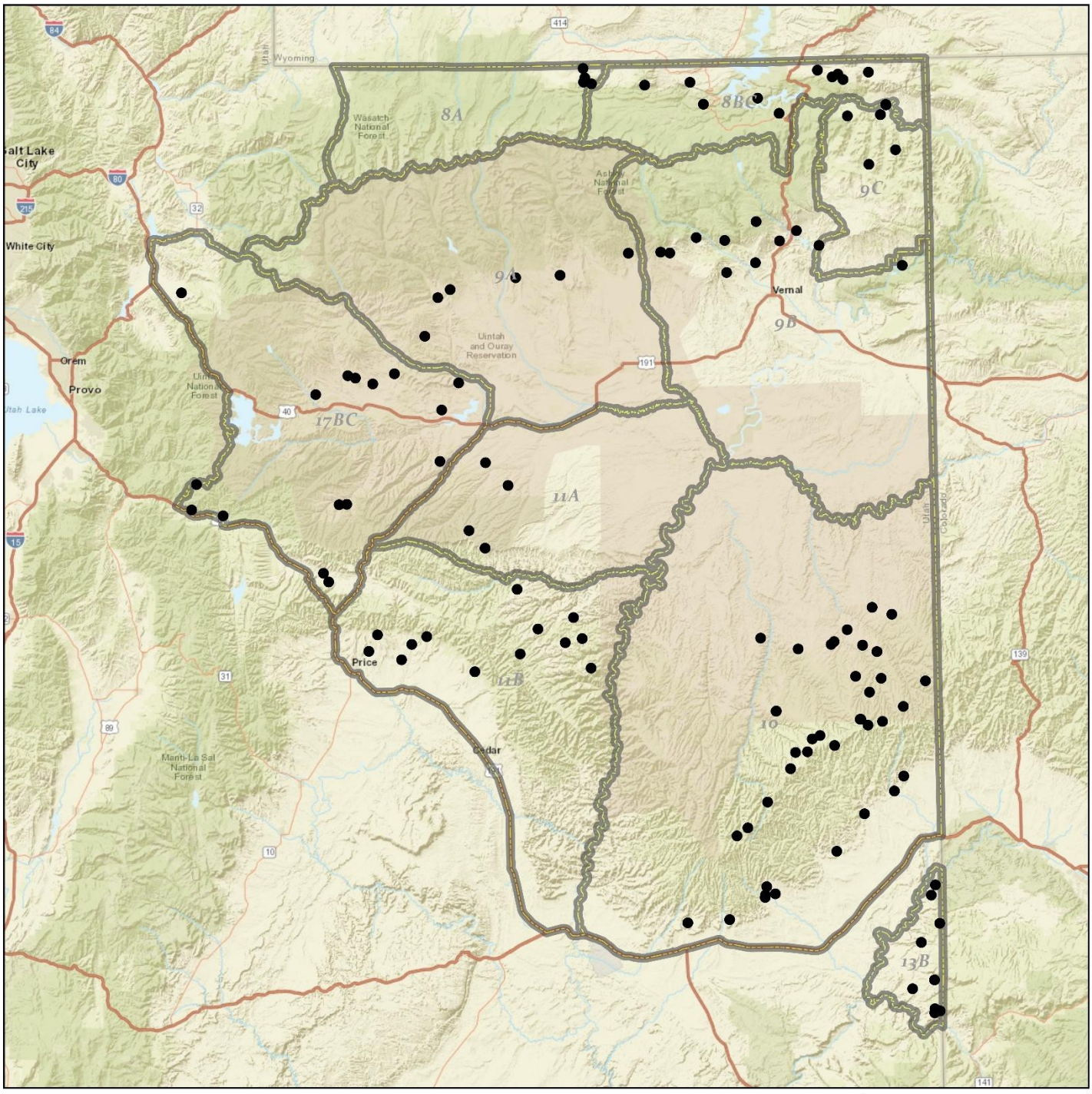
Uinta Wasatch Cache National Forest
- Mountain View Ranger District

US National Park Service
- Dinosaur National Monument

Ute Indian Tribe Natural Resources
- Fort Duchesne, Utah

Private landowners were cooperative in allowing access to study sites located on their land.
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# RANGE TREND STUDY SITES SURVEYED IN 2025




Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# RANGE TREND STUDY METHODS

Studies monitoring range trend depend greatly on site selection, especially when dealing with large geographic areas such as wildlife management units. Since it is impossible to intensively monitor all vegetation or habitat types within a unit, it is necessary to concentrate on specific sites and/or "key" areas within distinct plant communities on big game ranges. These "key" areas should be places where big game animals have demonstrated a definite pattern of use during normal climatic conditions over a long period. Trend studies are located within these areas of high use and/or crucial habitat as agreed upon by the Utah Division of Wildlife Resources (DWR), Bureau of Land Management (BLM), and US Forest Service (USFS) personnel. Historically, range trend studies were established in conjunction with permanently marked pellet group transects. Once a "key" area is selected, then specific placement for sampling will be determined. The sampling grid is carefully placed in order to adequately represent the surrounding area. Half-high steel fence posts or similar material permanently mark all sampling baselines. The first, or "0-foot baseline stake", is marked with a metal tag for proper identification of the transect.

Study sites for the Watershed Restoration Initiative (WRI) are placed to monitor vegetation treatment projects. Studies are established to assess conditions prior to treatment. Each study is re-read approximately every 3-5 years following treatment.

**Vegetation Composition**

Study Site Setup: Study sites are set up to determine vegetation composition. The standard study site setup consists of a 500-foot baseline (five consecutive 100-foot transects) and a 100-foot belt that crosses perpendicular to each transect. Each 100-foot belt is placed at a predetermined footmark along each transect and is centered on the 50-foot mark of each belt. When a standard study setup will not fit within the desired study location, the baseline can be modified by doglegging, splitting or shortening the baseline. If the baseline is shortened by removing one or more 100-foot transect(s), the corresponding belt should be moved to another transect. Regardless of how the baseline is setup, all five belts need to be included in the study site setup. A rebar stake is placed at the beginning of each belt to ensure that future sampling is in consistent alignment with the originally sampled belt.

1/4 m² quadrat: A 1/4 m² quadrat is centered every 5 feet along the left side of the belt, starting at the 5-foot mark. Cover and nested frequency values are determined for vegetation, litter, rock, pavement, cryptogams, and bare ground. Cover and nested frequency values are also estimated for all plant species occurring within a quadrat, including annual species. However, prior to 1992 no data was collected for annual species.

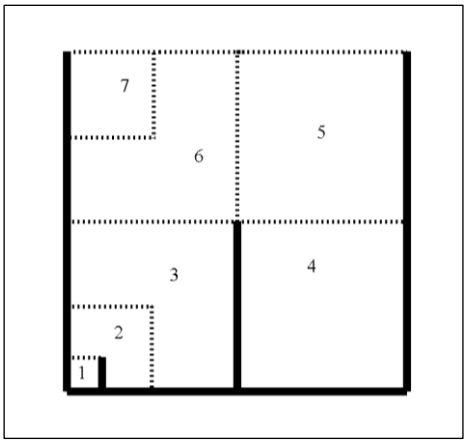



**Figure 1** Cover classes of the 1/4 $m^2$ sampling quadrat

Quadrat Cover: Cover is determined using an ocular cover estimation procedure using seven cover classes (Bailey and Poulton 1968, Daubenmire 1959). The seven cover classes are: 1) .01-1%, 2) 1.1-5%, 3) 5.1-25%, 4) 25.1-50%, 5) 50.1-75%, 6) 75.1-95%, and 7) 95.1-100% (Figure 1). For example, to estimate vegetation cover with this method, an observer would visualize which cover class all the vegetation would fit into if the plants were moved together until they were touching. To quantify percent cover for bare ground, litter, rock, pavement, and cryptogams, the observer would visually estimate which cover class could accommodate all of the specified cover type within the quadrat. These numbers are then recorded. To determine percent cover for each belt, the midpoint for each cover class value observed is summed and divided by the number of sampling quadrats (20). The mean for the five belts is the percent cover for a given site.

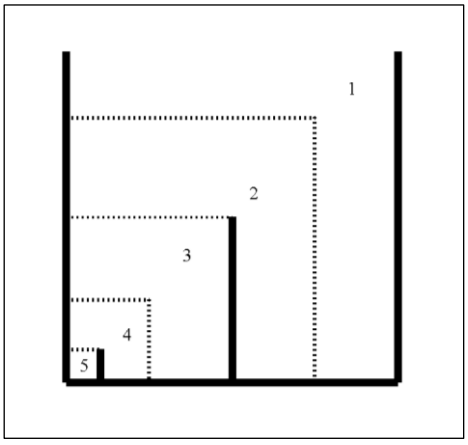



**Figure 2** Nested frequency sub-quadrats of the 1/4 $m^2$ sampling quadrat

Nested Frequency: Nested frequency values for the quadrat range from 1-5 according to which area or sub-quadrat the plant species or cover type is rooted in. The notation for each sub-quadrat is as follows: 5 = 1% of the area, 4 = 5% of the area, 3 = 25% of the area, 2 = 50% of the area, and 1 = the remainder of the quadrat. Each time a particular plant species or cover type occurs within the quadrat; it is scored relative to which of the smallest nested quadrats it is rooted in (in the case of vegetation) or where it first occurs (for all other cover types). The highest possible score is 5 for each quadrat occurrence and 100 per belt, for a possible score of 500 for each species or cover type at a given site (Figure 2).

Higher nested frequency scores represent a higher abundance for that plant species or cover type. These summed values are used to help determine changes in trend

and composition through time. Nested frequency has been found to be a more sensitive measurement for changes taking place within plant communities than quadrat frequency (Smith et al., 1987; Smith et al., 1986; Mosley et al., 1986). Plant cover and density values are not reliable indicators of trend for herbaceous species and can fluctuate greatly with precipitation and time of season sampled. Therefore, plant cover and density values can be misleading if used independently and do not necessarily indicate changes in composition and/or distribution of key plant species.

Line Intercept Cover: Total canopy cover of shrubs or trees is also estimated using the line-intercept method ([1]U.S. Department of Interior Bureau of Land Management 1999). The total distance intersecting the line by a particular species of tree or shrub along each belt is divided by the total length of the line to give percent canopy cover. A six-inch gap rule is used in measuring intercept; gaps less than six inches between the same tree or shrub species are included in total measurement (Boyd et al., 2007).

Shrub Density & Characterization: Shrub densities are estimated using five, 1/100th acre strips centered over the length of each 100-foot belt. All shrubs rooted within each strip are counted and categorized using a modified Cole Browse Method ([2]U.S. Department of Interior Bureau of Land Management 1999):

| | |
|---|---|
| Seedling: | Plants up to three years old, which have become firmly established, usually less than 1/8-inch diameter. |
| Young: | Larger with more complex branching. Does not show signs of maturity. Usually between 1/8 and 1/4-inch diameter. |
| Mature: | Complex branching, rounded growth form, larger size, seed is produced on healthy plants. Generally larger than 1/4-inch diameter. |
| Decadent: | Plant, regardless of age, that is in a state of decline, usually evidenced by 25% or more dead branches. |
| Dead: | A plant that is no longer living. |

Data Collection for Aspen Density by Size Class: Starting in 2011, aspen density was estimated using an aspen classification method by Jones, Burton, and Tate (2005). All aspen stems within 67 cm of each side of 100-foot distance tape are counted and recorded in the following size classes:

| | |
|---|---|
| Size Class I: | less than or equal to 1.5 feet (18 inches).<br>This class size represents the annual or recent recruitment of suckers due to suckering at root buds. |
| Size Class II: | greater than 1.5 feet to 5 feet.<br>This class size represents the survival of suckers and the progression of recruitment of existing suckers that are vulnerable to browsing of the terminal leader. |
| Size Class III: | greater than 5 feet and up to 1 inch dbh.<br>This class size represents the aspen regeneration grown above the height range that is vulnerable to browsing; the minimum height for size class III represents the maximum browse line height for herbivores present. |
| Size Class IV: | greater than 1 inch dbh.<br>Class IV captures information for all remaining cohorts in the plot. |

Shrubs are also rated according to their availability and the amount of use they display, and placed in one of nine form classes:

1. All available, lightly hedged
2. All available, moderately hedged
3. All available, heavily hedged
4. Largely available, lightly hedged
5. Largely available, moderately hedged
6. Largely available, heavily hedged
7. Mostly unavailable
8. Unavailable due to height
9. Unavailable due to hedging

Degree of hedging is measured by the percentage of the twigs or branches that are browsed.

| | |
|---|---|
| Lightly hedged*: | 0 to 40 percent of twigs browsed |
| Moderately hedged*: | 41 to 60 percent of twigs browsed |
| Heavily hedged*: | Over 60 percent of twigs browsed |
| Largely available: | One-third to two-thirds of plant available to animal |
| Mostly unavailable: | Less than one-third of plant available to animal |
| Unavailable: | In classifying browse to a form class, unavailability may be the result of height, location, or density |

*Degree of hedging is based on leader use over the past three years: current annual growth is not included.

Shrubs are also rated on their health and placed into one of four vigor classes:

1. Normal and vigorous
2. Insect infested or diseased
3. Poor vigor
    - Chlorotic or discolored leaves, smaller than normal stems or leaves, flowering restricted, partially trampled, pulled up, or otherwise damaged. Stunted growth, partial crown death.
4. Dying
    - Substantial portion of crown dead (more than 50%), more extreme than 3 above. Probably an irreversible condition.

Height and Crown

Each mature shrub species closest to every 10-foot mark along a sampling belt is measured to determine average height and crown. This allows a maximum sample of 50 plants per species to be measured at a given site depending on their respective densities. Height and Crown measurements were discontinued prior to the 2021 field season.

Point-Center Quadrat Method: Tree density is determined using the point-center quarter method (Mitchell, 2007; Dahdouh-Guebas and Koedam, 2006; Pollard, 1971; Cottam and Curtis, 1956) at 100-foot intervals along the baseline measuring to a maximum of 15 meters. The strip method that is used to estimate shrub density can, in most cases, effectively inventory seedling and young tree densities. However, the strip method is less effective at estimating density of mature trees that are often widely distributed.

Animal Occupancy: The pellet group transect utilizes (50) 100ft$^2$ circular plots that are placed through the study area. These are usually two parallel transects of 25 plots on each side of the vegetation transect which runs 400 feet to 500 feet in length. The number of recent pellet groups for wildlife (usually deer and elk) and pats for cattle are recorded. That number is then converted to days use per acre (hectare) (Neff, 1968). Quadrat frequency of wildlife and livestock droppings is also captured within the 1/4 m$^2$ quadrat. Rabbit pellet groups are not included in the pellet group transects but are sampled in quadrat frequency.

Other Information: Management background information, photographs, and knowledgeable plant identification add to the dataset for each site. Management and background information for each site is obtained from the administering agency. Repeat photographs are taken including a general view down and back up the baseline. A close-up of each half-high baseline post further characterizes individual sites. Correct plant identification is critical for a complete and accurate site analysis. Starting in 2016, species identification and classification is reported following the USDA Plant Database taxonomic nomenclature (USDA, NRCS, 2016). Prior to 2015, species identification mostly followed "A Utah Flora" (Welsh et al., 2003). In some cases, most notably *Agropyron sp*. and *Purshia sp.*, the species names used were those found in the Range Trend Study Plant Species List (Giunta, 1983), Intermountain Flora (Cronquist et al., 1977), and the Intermountain Range Plant Names and Symbols (Plummer et al., 1977) and were retained to maintain continuity and alleviate confusion with earlier published reports.

# TREND DETERMINATION

The methods described above rely on relative and absolute measurements of plant composition as determined from the frequency, cover, and density data. In addition, estimates of plant vigor, average height and crown diameter, form class, and age class are utilized to characterize shrub populations.

In order to assess and interpret the landscape in a more effective way, trend assessments are no longer formally addressed within the report and have been replaced by the Desirable Components Index (DCI), Woodland Succession Phase models, and State-and-Transition Models that are associated with their Ecological Site as described by the National Resources Conservation Service (NRCS). Using these three methods in conjunction will give land managers a more complete assessment of the area of interest, and what measures, if any, need to be taken to improve the ecology of a site.

Desirable Components Index: Range Trend Program personnel created the desirable components index (DCI) as a tool to address condition and/or value of winter ranges for mule deer. This index is meant to be a companion to, not a replacement for, the site-specific range trend assessments that are found in the annual Utah Big Game Range Trend Studies report. This index was designed to score mule deer winter range based upon several important vegetation components (i.e. preferred browse cover, shrub decadence, shrub young recruitment, cover of perennial grasses, cover of perennial forbs, cover of annual grasses, and presence of noxious weeds). Although the index may be useful for assessing habitat for other species (i.e. sage-grouse and elk), the rating system was devised to specifically address mule deer winter range requirements.

This index is used primarily to determine if a particular site has the vegetation components necessary to be good winter range for mule deer. It can also be used to identify areas where habitat restoration projects may be needed and assist land managers in determining possible rehabilitation options. Because it does not take into account factors such as soil stability, hydrologic function, and other environmental factors, it should not be used to assess sites' function and/or condition as typically used by the Federal land management agencies.

Desirable mule deer winter range provides 12-20% of preferred browse cover, 20% or less shrub decadency, and 10% or more of the shrub population is young. The herbaceous understory contains 8-15% perennial grass cover, 5% perennial forb cover, and less than 5% annual grass cover. Based on these criteria, communities are scored on a 100-point scale using the following system:

*Preferred Browse (60 points)*

(Preferred Browse species are favorable or crucial to deer and are broken into three categories; Highly Preferred, Preferred and Key).

Preferred Browse Cover (30 pts. possible)

- Highly Preferred species = 1.5 points for each 1% of cover, Preferred species = 1.25 points for each 1% of cover and Key species = 1 point for each 1% of cover (maximum 30 points)

Percent Decadence (15 points possible)

- 0.3 points for each 1% under 50% decadence and -0.3 points for each 1% over 50% decadence (maximum 15 points or minimum -15 points)

Percent Young (15 points possible)

- 0.5 points for each 1% of young

*Herbaceous Understory (40 points)*

Perennial Grass Cover (30 points possible)

- 2 points for each 1% cover

Perennial Forb Cover (10 points possible)

- 2 points for each 1% cover

Annual Grass Cover (-20 points possible)

- -0.75 points for each 1%cover

Noxious Weeds (State List)

- -2 points for each species present

The Desirable Components Index ratings are divided into four categories because each community has a different ecological potential. These categories include very low potential (Desert Ecological Site), low potential (Semidesert Ecological Site), mid-level potential (Upland Ecological Site) and high potential (Mountain and High Mountain Ecological Sites) categories. The four categories are scored based on the above criteria as follows:

Very Low potential scale (Desert Ecological Site)

| | |
|---|---|
| > 50 | Excellent |
| 50-40 | Good |
| 40-25 | Fair |
| 25-10 | Poor |
| < 10 | Very Poor |

Low potential scale (Semidesert Ecological Site)

| | |
|---|---|
| > 65 | Excellent |
| 45-64 | Good |
| 25-44 | Fair |
| 10-24 | Poor |
| < 10 | Very Poor |

Mid-level potential scale (Upland Ecological Site)

| | |
|---|---|
| > 80 | Excellent |
| 79-65 | Good |
| 64-50 | Fair |
| 49-35 | Poor |
| < 35 | Very Poor |

High potential scale (Mountain and High Mountain Ecological Site)

| | |
|---|---|
| > 90 | Excellent |
| 89-70 | Good |
| 69-55 | Fair |
| 54-40 | Poor |
| < 39 | Very Poor |

Once a DCI score has been determined for a particular site, the score can be compared to previous sample years in order to determine a quality trend and better assess conditions that may need to be addressed within the community for mule deer habitat (i.e. .increasing preferred browse cover, decreasing the decadence to young ratio, increasing perennial herbaceous cover, or control/removal of noxious weeds et cetera).

Woodland Succession: Although pinyon-juniper woodlands are an important community within their own ecotype, sagebrush steppe, mixed shrub, and grassland communities have experienced significant encroachment of pinyon-juniper woodlands. As active encroachment within these communities continues, abiotic and biotic structures and functions are interrupted, which leads to the reduction of wildlife habitat, forage production, and biodiversity. Moreover, encroachment increases fuel load and fire frequency jeopardizing remnant shrub and grass communities to future loss. In an attempt to describe the succession or maturation of pinyon-juniper, phases of succession are presented within the report to aid managers in identifying the progress of infilling on a particular site and what type of input may be necessary for site rehabilitation (Tausch, Miller, Roundy, & Chambers, 2009).

Phase I: is described as having an open canopy where crown lift is absent, there is active recruitment of young pinyon-juniper trees to the community with low seed production, and an intact shrub understory (Tausch, Miller, Roundy, & Chambers, 2009).

Phase II: is described by the expansion of the pinyon-juniper canopy where crown lift is absent, there is active recruitment of young pinyon-juniper trees to the community with moderate to high seed production, and a shrub understory that ranges from nearly intact to one that is significantly thinning (Tausch, Miller, Roundy, & Chambers, 2009).

Phase III: is described by the stabilization of the pinyon-juniper canopy where crown lift is present and lower limbs are dying, recruitment of young trees is limited with low to moderate seed production, and the shrub understory exhibits 75% or greater dead plants throughout the respective population (Tausch, Miller, Roundy, & Chambers, 2009).

State-and-Transition: Ecological sites are individual land types that can support specific plant species or communities based on the characteristics for their respective land type. Each ecological site therefore has its own potential and responds according to that potential when a site is influenced by natural or anthropomorphic inputs. State-and-Transition modeling attempts to describe an individual ecological site's response to these inputs by dividing the plant communities into states that are comprised of one to multiple community phases and to potentially predict the direction of a community transitioning from one state to another. State-and-Transitions are not trends per se, but rather an illustration of a community's current state in which it has the potential to respond positively or negatively to triggers and thresholds specific to that ecological site. As a tool, State-and-Transition models can provide a way for land managers to interpret a landscape and provide meaningful assessment and monitoring for landscape management. This report identifies each site's potential by supplying the ecological site name and corresponding number, and where available, verifying the provided NRCS state-and-transition models with range trend's quinquennial data, and a description of the transitions between states and phases over the duration of each study. Where not available, state-and-transition models are not referenced, but an attempt is made to describe the transitional processes that have occurred over the duration of a particular study not referenced to a model.

# REPORT FORMAT

The first page of the report is the map page, which has a topographic map and a diagrammatic sketch to illustrate the study location. The map page also contains three sections, *Location information*, *Transect Information* and *Directions to Site,* which contain directions, location, and transect setup descriptions. Following the map page, discussions of the study site are addressed by several topics including *Site Information*, *Wildlife Habitat and Vegetation History*, *Site Notes*, *Soils, Site Potential*, and "Trend Summary" tables. Site information contains geographic information such as land ownership, allotment, elevation, aspect, slope, and sample dates. *Disturbance History* contains all known disturbances that have occurred on the site. Known seed mixes are listed within the table named "SeedMix." *Habitat and Vegetation Information* contains wildlife habitat that the site falls within for specific big game and other species of interest. *Vegetation History* follows *Wildlife Seasonal Habitat* and evaluates any major compositional transitions within the vegetation community. Site notes discuss any miscellaneous information as it relates to the site and immediate area. Site potential presents a table containing average annual precipitation, NRCS taxonomic soil classification, NRCS ecological site name, and NRCS ecological site number. The table titled "Soil Analysis Data" presents texture and chemical characteristics found on the site. The *States and Transitions* portion states if the site has a defined state and transition model available and is followed by, if available, descriptions of any state or phase transitions that have occurred on the site as it relates to the State-and-Transition diagram modeled by the NRCS. Additional assessment is made by comparing photographs from year to year which can be referred to on the webpage http://wildlife.utah.gov/range-trend.html.

The "Trend Summary" tables contain compiled vegetation data for each site. A computer-generated data summary presents the pooled data for nested frequency, quadrat frequency, basic ground cover, soil characterization, shrub density, and shrub characterization.

**Report Description**

The following tables and partial tables are examples from study sites Morris GIP (01R-14) and Scare Canyon (02-46).

*Map Page*

The name and directions for locating a site are given on the map page. A topographical map and diagrammatic sketch are provided to show spatial reference of site location and arrangement. A 7.5 minute topographical map name and public land survey description are located below the map. In addition, UTM coordinates follow the public land survey location. Compass bearings are in degrees relative to magnetic north, unless specified as true north (T). Directions to a site and baseline are provided starting from a prominent location on a mileage and turn-by-turn basis that is closely referenced to the diagrammatic sketch. Also included on this page are the identification and dimensions of the specified transect, which include the browse tag number by which the transect is identified, transect bearing and length, belt placement as it relates to the baseline, and belt marker placement as it relates to the belt itself.

*Site Information*

Table 1: The "Disturbance History" table summarizes what type of treatments and/or disturbances have affected the site over its history. Where available, historic treatments have been listed that have occurred on the site prior to establishment. If applicable, treatment projects that are associated with the Utah Watershed Restoration Initiative (WRI) are referenced by their project number. Finalization dates or the date in which a particular disturbance occurred are listed with reported affected acreage of the respective disturbance.

**Table 01R-14.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Mechanical - Push | Morris Ranch | 1503 | November-December 2008 | 797 |
| Seeding - Rangeland Drill | Morris Ranch | 1503 | November-December 2008 | 797 |

Table 2: The "Seed Mix" tables are included when a seed mix is made available and are referenced to a particular WRI project. Additionally, multiple seed mixes are often associated with one particular treatment and are combined to simplify the appearance of the report.

**Table 01R-14.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Morris Ranch | | | Drill | Dec 2008 | 450 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | Nordan | 2.00 | 1.78 |
| G | Agropyron fragile | Siberian Wheatgrass | Vavilov | 1.00 | 0.84 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Secar | 2.00 | 1.85 |
| G | Pseudoroegneria spicata | Bluebunch Wheatgrass | Anatone | 1.00 | 0.82 |
| G | Thinopyrum intermedium | Pubescent Wheatgrass | Luna | 2.00 | 1.80 |
| F | Medicago sativa | Alfalfa | Ladak | 0.44 | 0.40 |
| F | Medicago sativa | Alfalfa | Ranger | 0.56 | 0.51 |
| F | Onobrychis viciifolia | Sainfoin | Eski | 1.44 | 1.40 |
| F | Onobrychis viciifolia | Sainfoin | Eski | 0.54 | 0.47 |
| F | Sanguisorba minor | Small Burnet | Delar | 1.00 | 0.95 |
| S | Atriplex canescens | Fourwing Saltbush | Central UT | 1.00 | 0.43 |
| S | Bassia prostrata | Forage Kochia | Humbolt/Lander NV | 1.00 | 0.67 |

*Habitat and Vegetation Information*

Table 3: The "Wildlife Seasonal Habitat" table is a summarization of habitat for big game and other species of interest and further categorizes the habitat into seasonal range and a value description of the habitat for the allied species.

**Table 01R-14.3 - Wildlife Seasonal Habitat.** DWR wildlife habitat and seasonality.

| Species | Habitat | Season | Brood/Young Rearing |
|---|---|---|---|
| Greater Sage-Grouse | occupied | year-long | brood-rearing |

Table 4: The "Vegetation History" table summarizes what major vegetation types have occurred on the site over the duration of the study. Ranges of sample years provide the length of time that the dominant vegetation type has persisted on the site with its corresponding species listed in the adjacent cell. Most vegetation types will have one dominant species listed: this is usually a shrub species (Appendix A - Vegetation Type). For example, some sites will have a shrub canopy that dominates the site with a perennial herbaceous understory that has similar average cover as the canopy but occurs infrequently. In this case, precedence is given to the shrub layer. Vegetation type can also be shared in the case of co-dominance. Using the example above, if the herbaceous understory had a higher cover, then the shrub layer would likely share the vegetation type with the perennial understory. The history of pinyon-juniper encroachment is characterized within the table stating the phase(s) of succession and the corresponding years of persistence. Phases of woodland succession may also influence the vegetation type. For example, pinyon-juniper encroachments in phase I are not considered co-dominant and may not be listed within the vegetation type column as they are a subordinate vegetation type. Trees in phase II are considered co-dominant with the co-dominant understory counterpart, and under these circumstances tree species are then listed with the understory counterpart within the vegetation type column.

The following "Vegetation History" table indicates that Wyoming big sagebrush was the dominant vegetation type on the site from 1982 to 2010, but the site transitioned to an annual grass-forb community in 2015. The table also indicates that woodland succession has remained in Phase I over the sample years until 2015 when the Taylor Mountain Fire removed all of the trees on the site. The transition from Wyoming big sagebrush to an annual grass-forb community that occurred between the 2010 and 2015 sample years indicates that a trigger mechanism has occurred, and a threshold has been crossed that lead to the change in community composition, and in this case is related to the Taylor Mountain fire that occurred in 2014.

**Table 01R-14.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2008 | Juniper/Black Sagebrush | Phase III |
| 2013 | Perennial Grass/Wyoming Big Sagebrush | Phase I |
| 2017 | Perennial Grass/Wyoming Big Sagebrush | Phase I |
| 2022 | Perennial Grass/Wyoming Big Sagebrush | Phase I |

*Site Notes*

This section contains miscellaneous information pertinent to the study site.

*Soils*

Table 4: Chemical and textural characteristics are listed here and were determined by laboratory analysis from a composite soil sample taken near each of the five baseline starting stakes (Allison and Moode, 1965; Day, 1965; Kenney and Nelson, 1982; Normandin et. al., 1998; Olsen et. al., 1954; Rhodes, 1982; Schoenau and Karamonos, 1993; Sims and Jackson, 1934; Walkley and Black, 1971).

The descriptive terms used for ranges in pH are as follows:

| | |
|---|---|
| Ultra Acidic | < 3.5 |
| Extremely Acidic | 3.5-4.4 |
| Very Strong Acidic | 4.5-5.0 |
| Strongly Acidic | 5.1-5.5 |
| Moderately Acidic | 5.6-6.0 |
| Slightly Acidic | 6.1-6.5 |
| Neutral | 6.6-7.3 |
| Slightly Alkaline | 7.4-7.8 |
| Moderately Alkaline | 7.9-8.4 |
| Strongly Alkaline | 8.5-9.0 |
| Very Strongly Alkaline | > 9.1 |

Percent organic matter (% OM) refers to the amount of organic matter in the top 12 inches of the soil profile. Parts per million (ppm) of phosphorus (P) and potassium (K) are also included. Values for phosphorus and potassium less than 6 ppm and 60 ppm, respectively, are considered to have low availability for plant growth and development (Tiedemann and Lopez 2004).

The electrical conductivity of the soil is reported in decisiemens per meter (dS/m). Electrical conductivity is related to the amount of salts more soluble than gypsum in the soil. The following classes can be used as a reference.

| | |
|---|---|
| Non saline | 0-2 |
| Very slightly saline | 2-4 |
| Slightly saline | 4-8 |
| Moderately saline | 8-16 |
| Strongly saline | >16 |

**Table 02-46.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 5.9 | 38.5 | 46.2 | 15.3 | 13.4 | 35.3 | 361.0 | 0.3 | 08/24/2022 |

*Site Potential*

This section is prefaced by the listing of the average annual precipitation, NRCS ecological site name, and NRCS ecological site number. The ecological site name and numbers are determined by range trend personnel by digging a soil pit on site to establish the soil characteristics of the site, which is then dichotomized to establish the name of the ecological site and number.

State-and-Transitions: The state-and-transitions section is prefaced by whether or not there is a defined state-and-transitions model available for the ecological site. When state-and-transition models are available, the state and community phase is specified for each sample year. States are identified in the diagram by whole numbers. For example, the reference state is referred to by 1, the current potential state by 2, and subsequent states are labeled 3, 4 and etc. While community phases are nested within a state and are identified by rational numbers. For example, community phases in state 1 would be identified by 1.1, 1.2, 1.3 etc. Transitions are labeled alpha-numerically and are preceded by the letter “T”. It is important to note that this section of the report does not stand alone, and care must be taken by the reader to reference the provided state-and-transition model in order to understand the driving factors within the community. The paragraph describes the community dynamics and changes that occur over the duration of the study

*Trend Summary Tables*

Table 6: The “Shrub/Tree Summary” table summarizes percent average quadrat cover and percent average line intercept cover for all shrub and tree species occurring on the site. Average quadrat cover is determined using cover classes in conjunction

with the 1/4m$^2$ quadrat to estimate percent quadrat cover. To more accurately estimate canopy cover of trees and shrubs, the line-intercept method is used along each 100-foot belt.

**Table 01R-14.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2008 | 2.5 | 0.2 | 7.9 | 3.1 | 0.3 | 38.6 |
| 2013 | 6.0 | 0.0 | 0.1 | 9.5 | 0.1 | - |
| 2017 | 9.8 | 0.1 | - | 11.4 | 0.4 | 0.1 |
| 2022 | 10.4 | 0.7 | - | 12.0 | 0.3 | 0.2 |

Table 7: The “Herbaceous Summary” table summarizes the total average cover for all grass and forb species and summarizes the nested frequency by life form.

**Table 01R-14.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2008 | 76 | 230 | 34 | 108 | 0.2 | 2.7 | 0.1 | 0.9 |
| 2013 | 339 | 284 | 65 | 103 | 1.7 | 11.8 | 0.2 | 1.7 |
| 2017 | 292 | 322 | 72 | 32 | 3.3 | 17.1 | 0.1 | 0.8 |
| 2022 | 225 | 320 | 124 | 30 | 1.0 | 13.9 | 0.4 | 0.1 |

Table 8: The “Basic Ground Cover” table summarizes average cover of vegetation, rock, pavement, litter, cryptogams, and bare ground. Vegetation crown cover estimates are projected vertically while the remaining cover types estimates are a planar projection and when combined they will usually exceed 100%. Therefore, comparisons can be made for all cover measurements except for general vegetation cover.

**Table 01R-14.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2008 | 13.4 | 0.4 | 53.8 | 26.7 | 3.6 | 14.9 |
| 2013 | 20.7 | - | 32.4 | 16.4 | 8.3 | 27.7 |
| 2017 | 27.8 | 0.0 | 24.7 | 28.2 | 5.4 | 33.6 |
| 2022 | 33.6 | 0.5 | 21.3 | 29.8 | 6.3 | 24.4 |

Table 9: The “Pellet Group Data” table summarizes the frequency of animal pellets sampled within the 100 quadrats placed along the sampling belts as well as data from a pellet group transect read parallel to the study site baseline. Quadrat frequency of rabbit or big game pellets indicates a relative amount of presence by a particular animal. This data can help characterize changes in wildlife occupancy patterns on a site.

The data presented in the “Days Use per Acre” section of the table is reported from the pellet group transect in conjunction with the vegetation transects. Animals that do not have a defined defecation rate are recorded as pellets per acre (ha) and are indicated by (*). Rabbit pellet groups were recorded in a few years close to the year 2000 but have not been sample within the transect since that time; these are also recorded as pellets per acre (ha).

**Table 01R-14.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2008 | 1 | 3 | - | 72 |
| 2013 | 2 | - | - | 5 |
| 2017 | 2 | 2 | - | 30 |
| 2022 | 4 | 5 | - | 6 |
| Year | Days Use Per Acre (ha) | | | |
| 2008 | 2.2 (5.4) | 2.7 (6.6) | - | - |
| 2013 | 20.3 (50.2) | 4.0 (9.9) | - | - |
| 2017 | 1.5 (3.6) | 6.0 (14.9) | 0.7 (1.7) | - |
| 2022 | 11.6 (28.7) | 2.7 (6.6) | - | - |

*Pellets per acre (ha)

Table 10: The “Grass Species” table summarizes the average cover and nested frequency for grass species. Species may be designated as annual species, noxious weeds, and/or introduced species by the associated symbol below the graph. Only species that are on the Utah Noxious Weed List are designated as a noxious weed.

**Table 01R-14.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Agropyron fragile[i] (Siberian wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hordeum jubatum (foxtail barley) | Pascopyrum smithii (western wheatgrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 2008 | - | - | 74 | 28 | - | 29 | 195 | 9 | - | 2 |
| 2013 | 124 | 72 | 338 | 35 | 1 | 5 | 123 | 51 | 42 | 13 |
| 2017 | 209 | 24 | 282 | 20 | - | 26 | 148 | 80 | 38 | 55 |
| 2022 | 102 | 7 | 188 | - | - | 1 | 206 | 152 | 5 | 101 |
| year | Average Cover (%) | | | | | | | | | |
| 2008 | - | - | 0.2 | 0.2 | - | 0.1 | 2.4 | 0.1 | - | 0.0 |
| 2013 | 3.2 | 2.1 | 1.7 | 0.9 | 0.0 | 0.0 | 1.6 | 2.0 | 1.9 | 0.0 |
| 2017 | 8.7 | 0.6 | 3.1 | 0.3 | - | 0.8 | 2.4 | 3.4 | 0.9 | 0.2 |
| 2022 | 2.7 | 0.3 | 0.6 | - | - | 0.0 | 3.5 | 7.3 | 0.1 | 0.3 |

a - Annual; n - Noxious Weed; i - Introduced Species

Table 11: The “Forb Species” table summarizes the average cover and nested frequency for forb species. Species may be designated as annual species, noxious weeds, and/or introduced species by the associated symbol below the graph. Only species that are on the Utah Noxious Weed List are designated as a noxious weed.

**Table 01R-14.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis douglasii (Douglas' dustymaiden) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Eriogonum cernuum[a] (nodding buckwheat) | Eriogonum ovalifolium (cushion buckwheat) | Eriogonum shockleyi (Shockley's buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Medicago sativa[i] (alfalfa) | Microsteris gracilis[a] (slender phlox) | Onobrychis viciifolia[i] (sainfoin) | Penstemon (beardtongue) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2008 | - | - | 3 | 5 | 3 | 3 | - | - | - | - | 12 | 34 | - | 24 | - | 1 | 77 |
| 2013 | 7 | 49 | 9 | 2 | - | 1 | 3 | 4 | 6 | - | - | 23 | 2 | 5 | 21 | 6 | 47 |
| 2017 | - | 65 | - | 2 | - | 2 | 7 | 5 | - | 3 | 3 | 14 | - | - | - | - | 4 |
| 2022 | 4 | 124 | 8 | - | - | 1 | 10 | - | - | 4 | - | 5 | - | - | - | - | 9 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2008 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | 0.1 | 0.6 | - | 0.0 | - | 0.0 | 0.2 |
| 2013 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.8 | 0.1 | 0.0 | 0.3 | 0.2 | 0.3 |
| 2017 | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.7 | - | - | - | - | 0.0 |
| 2022 | 0.0 | 0.4 | 0.0 | - | - | 0.0 | 0.0 | - | - | 0.1 | - | 0.0 | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

Table 12: The "Shrub and Tree Species" table summarizes the quadrat average and line intercept cover for shrub and tree species. Species may be designated as tree species, preferred browse, and/or introduced species by the associated symbol below the graph. Preferred browse species are determined by Range Trend staff.

**Table 01R-14.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Bassia prostrata[pi] (forage kochia) | Ericameria nauseosa (rubber rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Juniperus osteosperma[t] (Utah juniper) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 2008 | 3.1 | - | - | - | - | 38.6 | 0.2 | 0.1 | - |
| 2013 | 0.5 | 4.5 | 4.4 | 0.1 | 0.1 | - | - | - | - |
| 2017 | 1.9 | 7.8 | 1.5 | 0.4 | 0.2 | 0.1 | - | - | - |
| 2022 | 3.9 | 7.7 | 0.4 | 0.3 | - | 0.2 | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 2008 | 2.5 | - | - | - | 0.0 | 7.9 | 0.2 | 0.0 | 0.0 |
| 2013 | 0.5 | 2.7 | 2.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - |
| 2017 | 1.1 | 6.8 | 1.8 | 0.0 | 0.1 | 0.0 | - | 0.1 | - |
| 2022 | 4.5 | 5.5 | 0.2 | 0.7 | 0.2 | 0.0 | 0.0 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

Table 13: The "Shrub/Tree Characteristics" table summarizes shrub and tree species by density, age class distribution, utilization, poor vigor, and average height/crown.

**Table 01R-14.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 2008 | 2800 | 140 | 6 | 32 | 61 | 25 | 20 | 38 | 27/46 |
| 2013 | 1180 | 220 | 48 | 53 | 0 | 0 | 0 | 0 | 19/35 |
| 2017 | 3260 | 20 | 44 | 55 | 1 | 1 | 0 | 0 | 19/38 |
| 2022 | 6360 | 20 | 34 | 65 | 1 | 33 | 12 | 13 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2008 | - | - | - | - | - | - | - | - | -/- |
| 2013 | 4400 | 3840 | 80 | 21 | 0 | 1 | 1 | 3 | 32/45 |
| 2017 | 6700 | - | 47 | 53 | 0 | 12 | 7 | 0 | 29/50 |
| 2022 | 3900 | 260 | 13 | 81 | 6 | 6 | 5 | 11 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

Table 13a: The “Aspen Characteristics” table summarizes characteristics of the aspen community. Only aspen that was sampled using the size class distribution method is included in this table. Aspen sampled using the modified Cole Browse method is included in the “Browse Characteristics” table. Density is reported for the aspen population and is characterized by age class distribution, which is further subdivided into its corresponding age class demographics; this method was started in 2011. Aspen data prior to 2011 is included in Table 13.

The aspen population is then characterized by utilization, which is subcategorized by percentages of moderate and heavily hedged plants and concluded with the percentage of plants displaying poor vigor.

**Table 02-46.13a - Aspen Characteristics.** Characteristics of aspen populations including density, size class distribution, and vigor of plants.

| Year | Density | Size Class Distribution | | | | Utilization | | Poor Vigor (%) |
|---|---|---|---|---|---|---|---|---|
| | Plants per Acre | Class I (%) | Class II (%) | Class III (%) | Class IV (%) | Moderate (%) | Heavy (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | | |
| 2022 | 1520 | 29 | 21 | 7 | 43 | 0 | 0 | 2 |

Class I - <= 1.5 feet; Class II - > 1.5 feet to 5 feet; Class III - > 5 feet and up to 1 inch diameter at breast height (dbh); Class IV - > 1 in diameter at breast height (dbh)

Table 14: The “Tree Characteristics” table tree density estimates using the point-center quarter method which better estimates density of widely distributed trees than the shrub density strips. Average basal diameter is also listed in centimeters.

**Table 01R-14.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2008 | 796 | 10 | 15 | 25 | 35 | 15 | 20.4 |
| 2013 | 21 | 44 | 56 | - | - | - | 4.2 |
| 2017 | 13 | 80 | 20 | - | - | - | 2.4 |
| 2022 | 22 | 38 | 63 | - | - | - | 1.1 |

# PRE-1992 DATA

Pre-1992 Data: Data collected before July 19, 1992, has been excluded from the individual site summaries due to differences in sampling techniques and changes in sample size and area. This pre-1992 data can be found in the Utah Big Game Range Trend Studies 1982-1992 report. The following explanations address some of the major changes that have occurred with data collection. Nested frequency quadrat divisions and zones were different with four divisions as compared to the five divisions and zones. In addition, nested frequency data for annual species was not collected. Shrub density was collected along a separate transect that was adjacent to the nested frequency transect within three circular plots (radius of 8.3 or 11.7 ft) centered on three permanently marked stakes. Therefore, changes in density (before and after 1992) may not necessarily indicate changes in trend, especially shrub populations that are characteristically clumped and/or have discontinuous distributions. The earlier smaller sample could easily either overestimate or underestimate shrub populations. Other characteristics like percent decadence, percent poor vigor, percent heavy hedging, young recruitment, etc., are given more weight in determining shrub population transitions when comparing survey years where sample sizes were different. For more information on earlier range trend sampling methods, see the Pre-1992 Data report methodologies (Utah Big Game Range Trend Studies 1982-1992).

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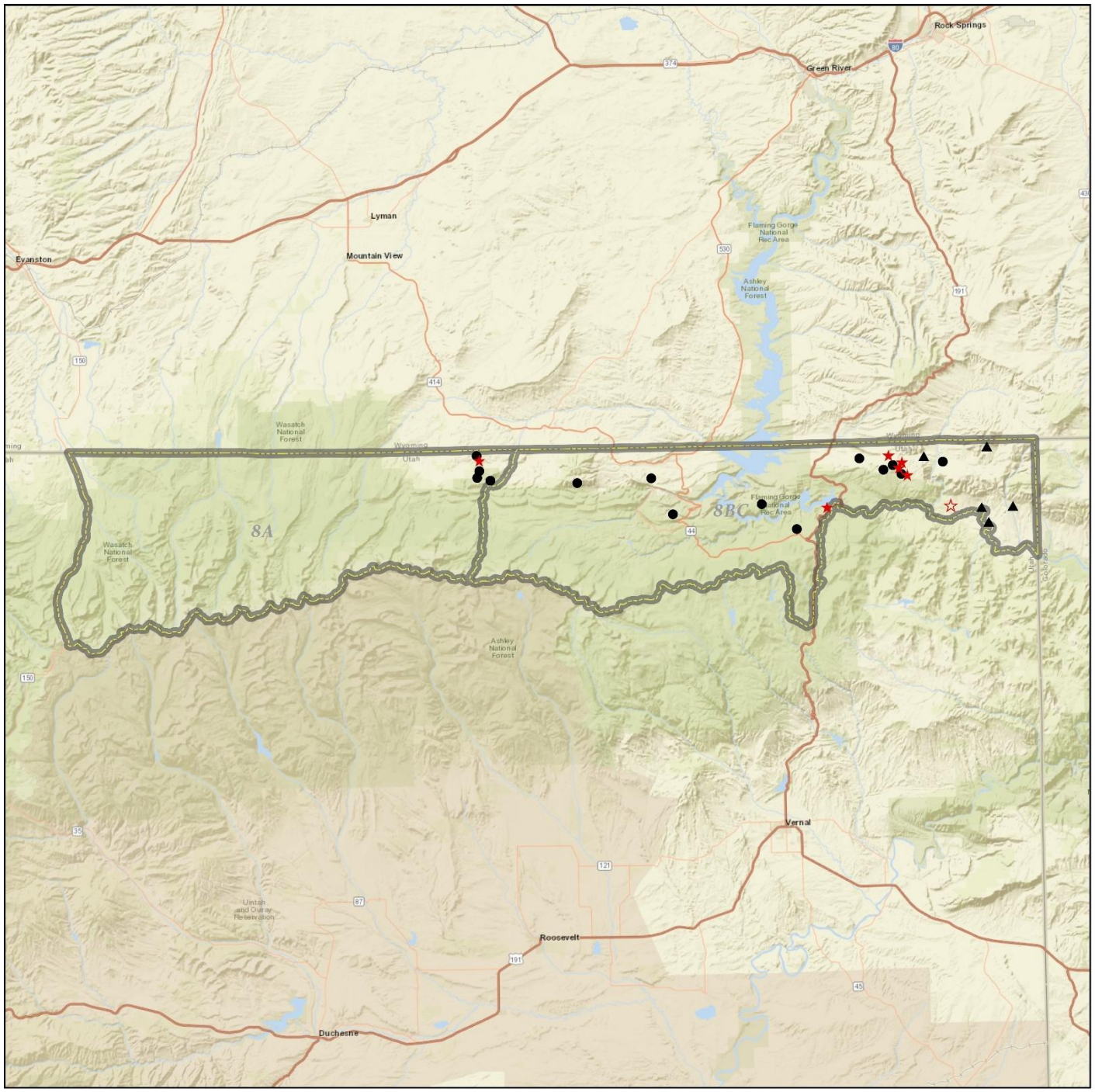
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# WILDLIFE MANAGEMENT UNIT 08 – NORTH SLOPE




0 4.75 9.5 19 28.5 38 47.5 57 66.5 76 Miles

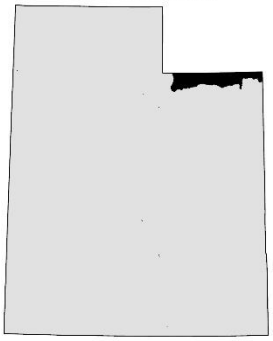
**Study Locations**
**Project, Status**

- RT, Active
- RT, Suspended
- WRI, Active
- WRI, Suspended

**Unit Boundary**

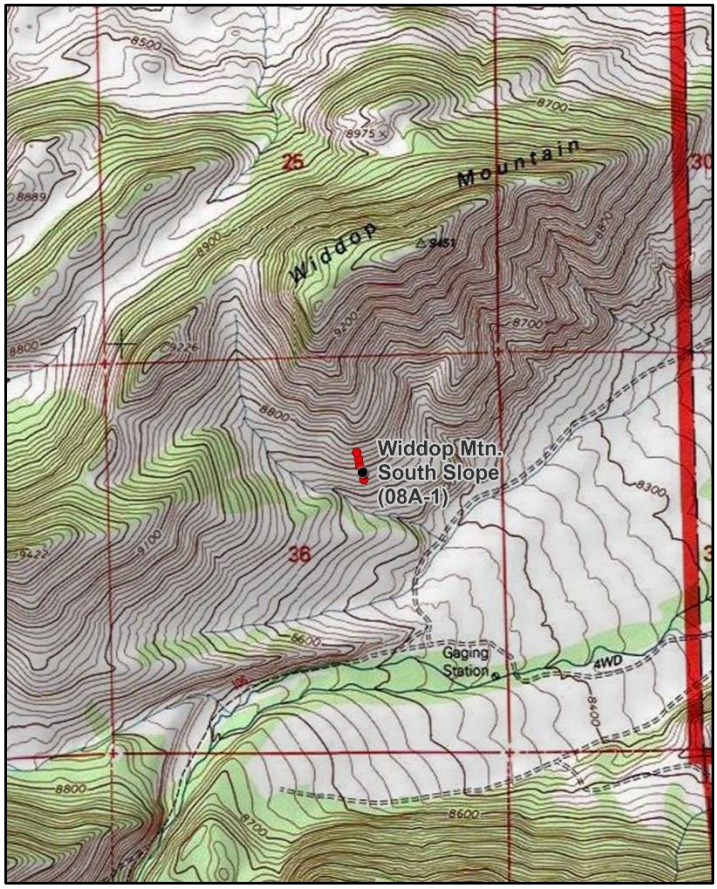
- Unit - 8

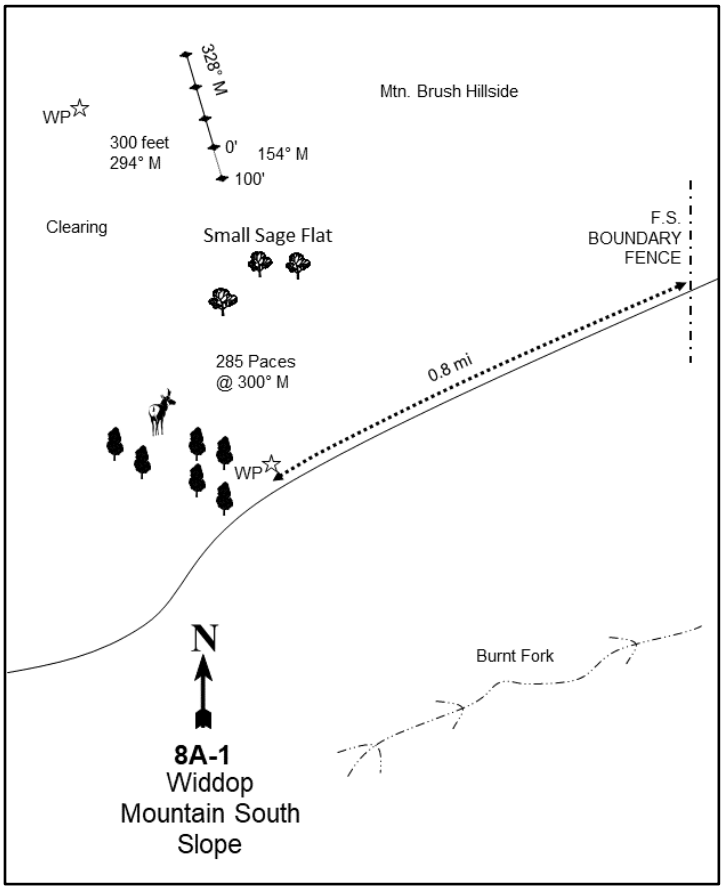
**Area of Interest**



Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# WIDDOP MTN. SOUTH SLOPE - STUDY NO. 08A-1




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Hoop Lake NW; Township 3N, Range 16E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 578061 East 4534013 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7155 |
| Transect Bearing | 154° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of Hoop Lake Road and State Highway 414, travel south along the Middle Fork of Beaver Creek for 7.4 miles to the Hole in the Rock Guard Station. From there, turn east toward Gregory Basin and travel along the canal road for 2.6 miles until the intersection at Telephone Hollow is reached. Travel to the Widdop Mountain North Slope site (08A-02). From there, go 0.9 miles (past study 08A-02) to a FS fence. Continue 1.8 miles to a gate. Go through the gate and continue 0.4 miles to a fork. Bear right at the fork and travel 2.3 miles southwest back to a FS boundary fence. Proceed 0.8 miles to a faint fork. Turn right and pull up about 50 yards along a small drainage. Stop by a witness post (tall green fence post) next to a clump of aspens. From here, walk 285 paces at 300 degrees magnetic up the slope. The 0-foot baseline stake is marked by browse tag #7155.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | BURNT FK |
| Elevation | 8,707ft (2,654m) |
| Aspect | South |
| Slope | 26% |
| Sample Dates | 08/30/1995, 08/03/2000, 08/03/2005, 08/10/2010, 07/07/2015, 08/04/2021, 07/08/2025 |

## Wildlife Habitat and Vegetation History

**Table 08A-01.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Rocky Mountain Elk | crucial | winter |
| Shiras Moose | crucial | winter |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 08A-01.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Alderleaf Mountain Mahogany | NA |
| 1995 | Alderleaf Mountain Mahogany | NA |
| 2000 | Alderleaf Mountain Mahogany | NA |
| 2005 | Alderleaf Mountain Mahogany | NA |
| 2010 | Alderleaf Mountain Mahogany | NA |
| 2015 | Alderleaf Mountain Mahogany | NA |
| 2021 | Alderleaf Mountain Mahogany | NA |
| 2025 | Alderleaf Mountain Mahogany | NA |

## Site Notes

Cattle that graze the area tend to stay in the valley bottom near water, so livestock use is light on the steep, brushy mountain slopes. Slopes similar to the study site mostly receive use from wintering elk. Moose also use the site, but do so infrequently. It was noted in the 2015 sample year that insects infested many of the alderleaf mountain mahogany (*Cercocarpus montanus*) plants.

## Soils

**Table 08A-01.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.3 | 55.3 | 20.7 | 24.0 | 3.2 | 4.6 | 99.2 | 0.7 | 08/30/1995 |
| Sandy Clay Loam | 7.2 | 53.6 | 23.8 | 22.6 | 3.8 | 3.3 | 70.4 | 0.8 | 08/03/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1988, the vegetation on this site has remained in a stable state as a mixed mountain brush plant community type dominated by alderleaf mountain mahogany (*Cercocarpus montanus*) (Photos, Pre-1992 Data, Table 08A-01.12, Table 08A-01.13). The herbaceous understory has remained diverse and abundant over the study years; native perennial graminoids including bluebunch wheatgrass (*Pseudoroegneria spicata*), Ross' sedge (*Carex rossii*), and Indian ricegrass (*Achnatherum hymenoides*) have dominated the understory throughout the sample period (Table 08A-01.7, 08A-01.10, Table 08A-01.11). This site will likely remain in this or a similar state unless a major disturbance occurs. There is some conifer encroachment in the drainage below the study site, but encroachment is not occurring on the transect itself (Photos).

This site likely serves as adequate summer range for mule deer due to the abundant and/or diverse shrub and herbaceous components (Table 08A-01.10, Table 08A-01.11, Table 08A-01.12). Deer presence was high in 2010, but it was low to moderate in all other years sampled. Elk presence has been high in most sample years, but it was moderate in 2010 and 2015. Cattle presence has remained low since 2000 (Table 08A-01.9). Utilization of preferred browse has been high in most sample years with most species reaching 90-100% of combined moderate and heavy utilization at some point during the study (Table 08A-01.13). On-site observations state that there was little utilization (10-20%) of the herbaceous perennial community during the most recent sample year (2025), and that the herbaceous and preferred browse communities appeared to have good primary growth and seed production (Photos).

## Trend Summary Tables

**Table 08A-01.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 23.6 | 1.9 | - | - | - | - |
| 2000 | 27.5 | 2.6 | - | - | - | - |
| 2005 | 28.2 | 4.3 | - | 28.5 | 3.6 | - |
| 2010 | 29.5 | 2.8 | - | 35.6 | 2.6 | - |
| 2015 | 33.1 | 3.4 | - | 37.0 | 4.2 | - |
| 2021 | 31.1 | 4.3 | - | 38.4 | 5.1 | - |
| 2025 | 28.8 | 4.2 | - | 32.9 | 3.6 | - |

**Table 08A-01.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 377 | 98 | 189 | - | 15.7 | 1.9 | 2.6 |
| 2000 | - | 397 | 62 | 204 | - | 20.3 | 1.5 | 3.9 |
| 2005 | - | 331 | 13 | 158 | - | 11.6 | 0.3 | 3.6 |
| 2010 | - | 356 | 26 | 174 | - | 17.2 | 0.3 | 2.6 |
| 2015 | - | 370 | 24 | 184 | - | 18.6 | 0.3 | 4.3 |
| 2021 | - | 379 | 20 | 209 | - | 20.5 | 0.2 | 5.3 |
| 2025 | - | 345 | 42 | 196 | - | 17.4 | 0.2 | 4.6 |

**Table 08A-01.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 10.5 | 0.0 | 47.7 | 13.4 | 6.3 | 38.8 |
| 2000 | 15.5 | - | 42.8 | 18.5 | 5.5 | 50.9 |
| 2005 | 14.4 | 0.3 | 34.3 | 17.6 | 4.9 | 45.4 |
| 2010 | 8.2 | 0.1 | 34.4 | 18.3 | 3.7 | 54.7 |
| 2015 | 12.2 | 0.3 | 32.2 | 12.6 | 3.3 | 59.9 |
| 2021 | 10.6 | 2.7 | 36.1 | 20.9 | 4.4 | 51.6 |
| 2025 | 16.8 | 0.4 | 39.9 | 11.9 | 4.4 | 49.3 |

**Table 08A-01.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer/Pronghorn | Rocky Mountain Elk | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | 20 | 40 | - | 4 | 1 |
| 2000 | 2 | - | 28 | - | 3 | 1 |
| 2005 | 3 | 4 | 23 | - | 9 | - |
| 2010 | - | 17 | 10 | - | 2 | - |
| 2015 | - | 6 | 43 | - | 5 | - |
| 2021 | 1 | 20 | 34 | - | 8 | - |
| 2025 | - | 25 | 39 | - | 8 | 3 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 1.5 (3.6) | 18.1 (44.7) | 66.4 (163.9) | - | 9.2 (22.7) | - |
| 2005 | 4.4 (10.8) | 0.7 (1.7) | 47.6 (117.5) | 0.6 (1.4) | 13.1 (32.3) | - |
| 2010 | 2.9 (7.2) | 53.6 (132.4) | 24.8 (61.2) | - | 2.9 (7.2) | - |
| 2015 | 2.9 (7.2) | 10.7 (26.5) | 36.8 (91.0) | - | - | - |
| 2021 | 1.5 (3.6) | 2.7 (6.6) | 48.3 (119.2) | - | 10.6 (26.3) | - |
| 2025 | 1.5 (3.6) | 28.8 (71.2) | 63.0 (155.6) | - | 11.6 (28.7) | - |

**Table 08A-01.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus inermis[i] (smooth brome) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leucopoa kingii (spike fescue) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 63 | 11 | 148 | 3 | - | 6 | 49 | 11 | 15 | - | 330 |
| 2000 | 48 | 2 | 181 | 14 | 5 | - | 28 | 10 | - | 1 | 326 |
| 2005 | 54 | 3 | 186 | 27 | - | 19 | 21 | - | 5 | 3 | 258 |
| 2010 | 38 | - | 175 | 48 | - | 4 | 35 | 12 | 9 | 2 | 287 |
| 2015 | 48 | - | 165 | 47 | 2 | 21 | 62 | 2 | - | 3 | 305 |
| 2021 | 52 | 4 | 133 | 27 | - | 26 | 74 | 15 | 17 | 4 | 318 |
| 2025 | 127 | 6 | 178 | 56 | - | 30 | 82 | - | - | 3 | 131 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 1.7 | 0.1 | 3.6 | 0.0 | - | 0.1 | 0.6 | 0.0 | 0.1 | - | 9.6 |
| 2000 | 1.3 | 0.0 | 6.0 | 0.1 | 0.0 | - | 0.2 | 0.1 | - | 0.0 | 12.5 |
| 2005 | 0.7 | 0.0 | 4.3 | 0.3 | - | 0.3 | 0.2 | - | 0.0 | 0.1 | 5.7 |
| 2010 | 1.6 | - | 5.0 | 0.3 | - | 0.1 | 0.3 | 0.1 | 0.2 | 0.0 | 9.6 |
| 2015 | 1.6 | - | 3.8 | 0.7 | 0.0 | 0.7 | 0.8 | 0.0 | - | 0.0 | 10.9 |
| 2021 | 2.1 | 0.0 | 4.3 | 0.2 | - | 1.4 | 1.8 | 0.2 | 0.4 | 0.0 | 10.1 |
| 2025 | 4.1 | 0.1 | 5.5 | 1.2 | - | 1.4 | 1.2 | - | - | 0.0 | 3.9 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08A-01.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Arabis holboellii[a] (Holboell's rockcress) | Astragalus gilviflorus (plains milkvetch) | Astragalus purshii (woollypod milkvetch) | Calochortus nuttallii (sego lily) | Camelina microcarpa[ai] (littlepod false flax) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja flava (yellow Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chaetopappa ericoides (rose heath) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium undulatum[a] (wavyleaf thistle) | Comandra umbellata (bastard toadflax) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erysimum capitatum[a] (sanddune wallflower) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 3 | - | - | 7 | - | - | - | 1 | 11 | 2 | 47 | 1 | 97 | - | 57 | - | - |
| 2000 | - | - | 1 | 2 | - | - | - | 7 | 17 | - | 60 | - | 73 | 1 | 1 | 1 | - |
| 2005 | 4 | - | 1 | 2 | - | 1 | - | 1 | 20 | - | 9 | 3 | 25 | - | - | 5 | - |
| 2010 | 14 | 2 | 4 | - | - | - | - | - | 21 | 9 | 8 | 4 | 38 | - | - | - | - |
| 2015 | 6 | - | 2 | 6 | - | 2 | 3 | 5 | 11 | - | 5 | 4 | 47 | 1 | 2 | 1 | 10 |
| 2021 | 6 | - | 4 | - | - | 3 | - | 1 | 23 | 3 | 11 | - | 55 | - | - | 6 | - |
| 2025 | 3 | - | - | 2 | 1 | - | 1 | 2 | 28 | - | 3 | 5 | 52 | - | 35 | 8 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | - | 0.1 | - | - | - | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 1.0 | - | 0.2 | - | - |
| 2000 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.1 | - | 1.5 | - | 0.9 | 0.0 | 0.0 | 0.0 | - |
| 2005 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.1 | - | 0.3 | 0.0 | 0.5 | - | - | 0.0 | - |
| 2010 | 0.0 | 0.1 | 0.0 | - | - | - | - | - | 0.1 | 0.0 | 0.3 | 0.0 | 0.3 | - | - | - | - |
| 2015 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.1 |
| 2021 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.2 | 0.1 | 0.1 | - | 0.3 | - | - | 0.0 | - |
| 2025 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.2 | - | 0.1 | 0.0 | 0.7 | - | 0.1 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lesquerella parvula (pygmy bladderpod) | Linum lewisii (Lewis flax) | Lithospermum incisum (narrowleaf stoneseed) | Lithospermum ruderale (western stoneseed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Phlox multiflora (flowery phlox) | Physaria acutifolia (sharpleaf twinpod) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 19 | 5 | - | 27 | - | 18 | 7 | - | 40 | 36 | - | - | 4 | 11 | - | - | 6 |
| 2000 | 40 | 23 | - | 30 | 1 | 27 | 26 | - | 32 | 35 | - | - | - | 2 | - | 1 | 1 |
| 2005 | 15 | 25 | - | 28 | - | 25 | 6 | - | 39 | 39 | 17 | - | - | 7 | 1 | - | 9 |
| 2010 | 54 | 18 | - | 23 | - | 19 | - | - | 52 | 17 | - | - | 2 | 17 | 2 | 2 | 1 |
| 2015 | 20 | 19 | 21 | 21 | - | 31 | 8 | 5 | 47 | 29 | 36 | 1 | 5 | 13 | - | 2 | 12 |
| 2021 | 13 | 28 | 11 | 29 | 8 | 31 | 5 | - | 76 | 37 | 12 | 2 | 2 | 4 | 1 | - | 19 |
| 2025 | 16 | 5 | 20 | 19 | - | 50 | - | - | 52 | 27 | 8 | 2 | 1 | 10 | 1 | 1 | 11 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.0 | - | 0.4 | - | 0.2 | 0.0 | - | 0.2 | 0.4 | - | - | 0.1 | 0.0 | - | - | 0.0 |
| 2000 | 0.3 | 0.1 | - | 0.4 | 0.0 | 0.5 | 0.4 | - | 0.5 | 0.6 | - | - | - | 0.0 | - | 0.0 | 0.0 |
| 2005 | 0.1 | 0.4 | - | 0.4 | - | 0.9 | 0.0 | - | 0.3 | 0.7 | 0.0 | - | - | 0.0 | 0.0 | - | 0.1 |
| 2010 | 0.2 | 0.0 | - | 0.5 | - | 0.7 | - | - | 0.4 | 0.1 | - | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 2015 | 0.1 | 0.2 | 0.3 | 0.8 | - | 0.7 | 0.2 | 0.0 | 0.4 | 0.3 | 0.1 | 0.0 | 0.1 | 0.1 | - | 0.0 | 0.1 |
| 2021 | 0.0 | 0.2 | 0.1 | 1.4 | 0.1 | 0.5 | 0.0 | - | 1.5 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 |
| 2025 | 0.1 | 0.0 | 0.4 | 0.9 | - | 1.1 | - | - | 0.5 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08A-01.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.9 | 0.3 | 0.2 | 26.6 | - | 0.3 | 0 | 2.8 | - | - | 0.5 | 0.5 |
| 2010 | 1.9 | 0.1 | 0.1 | 33 | - | 0.4 | 0.2 | 1.7 | - | - | 0.3 | 0.5 |
| 2015 | 1.8 | 0.3 | - | 34.9 | - | 0.1 | 0 | 2.8 | - | - | - | 1.3 |
| 2021 | 1.4 | 0.1 | - | 36.2 | - | 0.6 | 0.1 | 3.5 | 0 | - | 0.6 | 1 |
| 2025 | 1.3 | 0 | - | 30.8 | 0.1 | 0.3 | 0.1 | 2.2 | - | - | 0.6 | 1.1 |
| year | Quadrat Cover (%) | | | | | | | | | | | |
| 1995 | 1.1 | 0.0 | 0.7 | 21.5 | - | 0.5 | 0.1 | 0.6 | 0.0 | 0.0 | 0.2 | 0.8 |
| 2000 | 1.5 | 0.2 | 1.0 | 23.9 | - | 0.3 | 0.3 | 1.5 | - | 0.1 | 0.4 | 0.8 |
| 2005 | 1.8 | 0.2 | 0.5 | 25.1 | - | 0.6 | 0.2 | 2.6 | - | 0.0 | 0.4 | 1.1 |
| 2010 | 0.7 | 0.2 | 0.3 | 27.4 | - | 0.5 | 0.4 | 1.2 | - | 0.4 | 0.1 | 1.1 |
| 2015 | 1.2 | 0.4 | 0.0 | 30.7 | - | 0.3 | 0.4 | 2.2 | - | 0.1 | 0.4 | 0.9 |
| 2021 | 1.3 | 0.0 | 0.0 | 29.1 | - | 0.3 | 0.0 | 3.2 | 0.0 | 0.0 | 0.5 | 0.8 |
| 2025 | 1.2 | 0.2 | 0.1 | 25.3 | 1.5 | 0.2 | 0.0 | 3.3 | - | 0.0 | 0.5 | 0.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08A-01.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 200 | - | 50 | 50 | 0 | 30 | 20 | 0 | 70/80 |
| 2000 | 120 | 20 | 0 | 67 | 33 | 33 | 50 | 0 | 56/75 |
| 2005 | 180 | - | 0 | 89 | 11 | 11 | 89 | 0 | 58/75 |
| 2010 | 140 | - | 14 | 71 | 14 | 29 | 57 | 14 | 61/68 |
| 2015 | 320 | - | 44 | 56 | 0 | 75 | 19 | 0 | 70/75 |
| 2021 | 240 | - | 8 | 75 | 17 | 25 | 67 | 8 | - / - |
| 2025 | 140 | - | 14 | 86 | 0 | 86 | 14 | 14 | - / - |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 140 | - | 14 | 86 | 0 | 14 | 0 | 0 | 7/19 |
| 2000 | 280 | 40 | 21 | 79 | 0 | 0 | 0 | 0 | 5/16 |
| 2005 | 160 | - | 13 | 88 | 0 | 13 | 0 | 0 | 13/21 |
| 2010 | 260 | - | 0 | 100 | 0 | 0 | 15 | 0 | 9/18 |
| 2015 | 260 | 20 | 8 | 92 | 0 | 8 | 0 | 0 | 16/18 |
| 2021 | 140 | - | 0 | 100 | 0 | 0 | 29 | 0 | - / - |
| 2025 | 140 | - | 0 | 100 | 0 | 29 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 120 | - | 33 | 67 | 0 | 50 | 0 | 0 | 20/38 |
| 2000 | 140 | - | 0 | 71 | 29 | 71 | 0 | 14 | 21/46 |
| 2005 | 160 | - | 0 | 50 | 50 | 50 | 38 | 25 | 23/41 |
| 2010 | 80 | - | 0 | 25 | 75 | 50 | 50 | 25 | 17/37 |
| 2015 | 40 | 20 | 50 | 50 | 0 | 50 | 50 | 0 | 14/22 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 4320 | 40 | 27 | 72 | 1 | 44 | 34 | 30 | 79/129 |
| 2000 | 5160 | 140 | 30 | 61 | 10 | 29 | 57 | 3 | 58/95 |
| 2005 | 4920 | 140 | 28 | 70 | 2 | 8 | 88 | 1 | 70/109 |
| 2010 | 5120 | 140 | 29 | 71 | 0 | 31 | 27 | 6 | 72/102 |
| 2015 | 5500 | 100 | 14 | 85 | 1 | 27 | 64 | 87 | 63/93 |
| 2021 | 5100 | 40 | 27 | 66 | 8 | 4 | 92 | 9 | - / - |
| 2025 | 5320 | - | 18 | 82 | 0 | 11 | 80 | 0 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 260 | - | 46 | 54 | 0 | 0 | 85 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 820 | - | 20 | 81 | 0 | 0 | 0 | 0 | 23/30 |
| 2000 | 660 | - | 0 | 97 | 3 | 0 | 0 | 0 | 16/26 |
| 2005 | 420 | 20 | 5 | 95 | 0 | 5 | 0 | 0 | 18/34 |
| 2010 | 560 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/32 |
| 2015 | 540 | - | 4 | 96 | 0 | 15 | 0 | 0 | 17/26 |
| 2021 | 260 | - | 8 | 92 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 180 | - | 22 | 78 | 0 | 11 | 11 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 600 | - | 3 | 97 | 0 | 0 | 0 | 0 | 13/24 |
| 2000 | 420 | 60 | 0 | 91 | 10 | 0 | 0 | 5 | 10/18 |
| 2005 | 300 | - | 7 | 80 | 13 | 0 | 0 | 0 | 15/26 |
| 2010 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/25 |
| 2015 | 360 | - | 0 | 100 | 0 | 56 | 44 | 0 | 10/20 |
| 2021 | 160 | - | 0 | 100 | 0 | 0 | 0 | 13 | - / - |
| 2025 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 41/41 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/46 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 50 | 50 | 0 | 50 | 0 | 50 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 780 | - | 3 | 97 | 0 | 0 | 0 | 0 | 18/16 |
| 2000 | 2520 | 240 | 3 | 94 | 2 | 0 | 0 | 1 | 13/21 |
| 2005 | 3800 | - | 3 | 97 | 0 | 0 | 0 | 0 | 17/29 |
| 2010 | 2000 | 40 | 2 | 98 | 0 | 1 | 0 | 0 | 17/23 |
| 2015 | 4980 | 20 | 3 | 97 | 0 | 0 | 0 | 0 | 15/22 |
| 2021 | 5940 | 300 | 19 | 81 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 3860 | 20 | 10 | 88 | 3 | 0 | 3 | 2 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/10 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/28 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 20/19 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 38/25 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 13/21 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 20 | - | 100 | 0 | 0 | 100 | 0 | 0 | - / - |
| 2000 | 20 | - | 100 | 0 | 0 | 100 | 0 | 100 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 10/35 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/47 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 20/55 |
| 2021 | 20 | 20 | 0 | 0 | 100 | 100 | 0 | 100 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/60 |
| 2000 | 120 | - | 33 | 67 | 0 | 33 | 0 | 0 | 22/74 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 35/77 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/43 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 50 | 0 | 45/70 |
| 2021 | 120 | - | 0 | 83 | 17 | 17 | 33 | 17 | - / - |
| 2025 | 260 | - | 0 | 100 | 0 | 15 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 1280 | - | 6 | 94 | 0 | 3 | 0 | 0 | 16/21 |
| 2000 | 1240 | - | 8 | 81 | 11 | 8 | 5 | 3 | 15/25 |
| 2005 | 960 | - | 13 | 83 | 4 | 48 | 27 | 2 | 16/29 |
| 2010 | 1200 | - | 2 | 98 | 0 | 17 | 2 | 5 | 17/26 |
| 2015 | 1400 | - | 13 | 87 | 0 | 51 | 10 | 0 | 17/27 |
| 2021 | 900 | - | 11 | 80 | 9 | 11 | 18 | 9 | - / - |
| 2025 | 1320 | - | 26 | 74 | 0 | 21 | 5 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

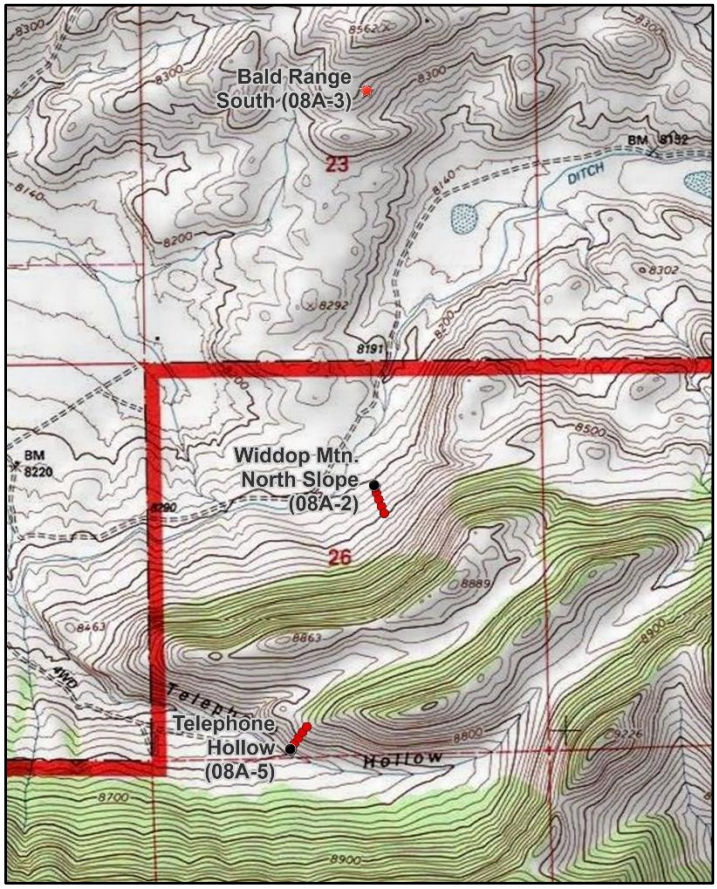
**Table 08A-01.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

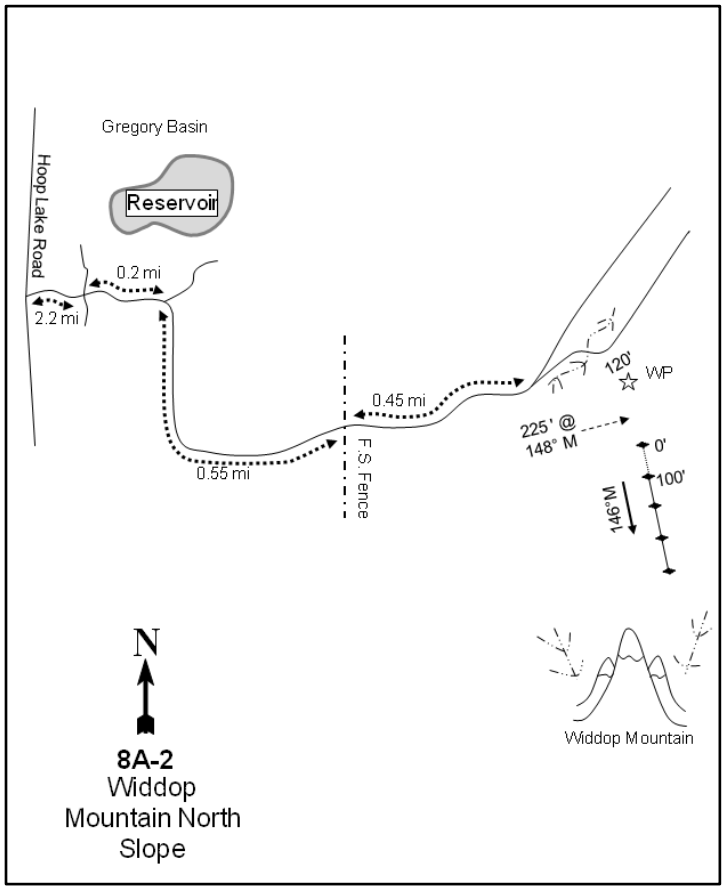
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus flexilis (limber pine) | | | | | | | |
| 2021 | 1 | - | 100 | - | - | - | 6.0 |
| 2025 | 1 | - | - | 100 | - | - | 5.0 |

**Table 08A-01.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 14.8 | 14.1 | 30.0 | 0.0 | 5.3 | 0.0 | **94.2** | Excellent |
| 2000 | 30.0 | 11.5 | 13.4 | 30.0 | 0.0 | 7.8 | 0.0 | **92.7** | Excellent |
| 2005 | 30.0 | 14.2 | 13.1 | 23.2 | 0.0 | 7.1 | 0.0 | **87.6** | Good |
| 2010 | 30.0 | 14.7 | 13.8 | 30.0 | 0.0 | 5.3 | 0.0 | **93.8** | Excellent |
| 2015 | 30.0 | 14.8 | 7.8 | 30.0 | 0.0 | 8.6 | 0.0 | **91.2** | Good-Excellent |

# WIDDOP MTN. NORTH SLOPE - STUDY NO. 08A-2




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Hoop Lake NW; Township 3N, Range 16E, Section 26 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 576306 East 4535528 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 684 |
| Transect Bearing | 146° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Two miles south of the Wyoming-Utah state line on the Hoop Lake Road along the Middle Fork of Beaver Creek, turn east toward Gregory Basin. Go 0.6 miles to a private property fence. Continue east 1.1 miles past a cabin to a fence. Go 0.1 miles to a fork and continue straight. Go 0.4 miles to an old four-way intersection south of Gregory Basin. Continue straight (east) 0.2 miles to an old cabin and bear right. Proceed 0.6 miles to the Forest Service boundary fence. Travel along the side of the fence for 0.45 miles to a faint fork. Bear right and go across the stream. Continue east 0.l miles toward the base of Widdop Mountain. On the south side of the road, look for a witness post in the sagebrush. The 0-foot baseline stake is 225 feet south of the witness post at 148 degrees magnetic. The 0-foot baseline stake is marked with browse tag #684.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | BURNT FK |
| Elevation | 8,300ft (2,530m) |
| Aspect | Northwest |
| Slope | 25% |
| Sample Dates | 08/30/1995, 08/03/2000, 08/02/2005, 08/03/2010, 07/07/2015, 07/13/2020, 07/08/2025 |

**Table 08A-02.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Telephone Hollow Lop and Scatter | 2536 | September 2014 | 303 |

## Wildlife Habitat and Vegetation History

**Table 08A-02.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |

**Table 08A-02.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Alderleaf Mountain Mahogany | NA |
| 1995 | Alderleaf Mountain Mahogany | NA |
| 2000 | Alderleaf Mountain Mahogany | NA |
| 2005 | Alderleaf Mountain Mahogany | NA |
| 2010 | Alderleaf Mountain Mahogany | NA |
| 2015 | Alderleaf Mountain Mahogany | NA |
| 2020 | Alderleaf Mountain Mahogany | NA |
| 2025 | Alderleaf Mountain Mahogany | NA |

## Site Notes

There is excellent thermal and escape cover provided by a dense conifer stand nearby.

## Soils

**Table 08A-02.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.4 | 41.3 | 31.1 | 27.6 | 5.4 | 6.1 | 147.2 | 0.6 | 08/30/1995 |
| Loam | 7.4 | 43.3 | 34.2 | 22.6 | 5.5 | 3.4 | 115.2 | 0.9 | 08/03/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1988, this site has remained in a stable state with a mixed mountain browse plant community dominated by alderleaf mountain mahogany (*Cercocarpus montanus*) (Photos, Pre-1992 Data). Although other browse has provided less cover than mountain mahogany, a number of other shrub species have also been present, including mountain snowberry (*Symphoricarpos oreophilus*) and slender buckwheat (*Eriogonum microthecum*), among others (Table 08A-02.12, 08A-02.13). The herbaceous understory has remained diverse and abundant throughout the duration of the study. Perennial graminoids, particularly Ross' sedge (*Carex rossii*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Indian ricegrass (*Achnatherum hymenoides*), have contributed a majority of the herbaceous cover in all sample years (Table 08A-02.10, Table 08A-02.11). This site will likely remain in this or a similar state in the future unless a major disturbance occurs.

This site likely serves as adequate summer range for mule deer due to the abundant and/or diverse shrub and herbaceous components (Table 08A-02.10, Table 08A-02.11, Table 08A-02.12). Deer presence has been low over the sample period. Elk presence has been moderate in most sample years, but it was high in 2000 and low in 2015 and 2025. Cattle presence has remained low to moderate since 1995 (Table 08A-02.9). Fifty percent or more of preferred browse plants have consistently shown signs of moderate to heavy use in most sample years (Table 08A-02.13). On-site observations state that there was no to little utilization of the herbaceous community during the most recent sample year (2025), and that the herbaceous and preferred browse communities appeared to have good primary growth and seed production (Photos).

## Trend Summary Tables

**Table 08A-02.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 37.7 | 4.2 | - | - | - | - |
| 2000 | 38.3 | 4.1 | - | - | - | - |
| 2005 | 35.8 | 5.0 | 0.0 | 42.4 | 4.1 | - |
| 2010 | 33.0 | 4.6 | 0.0 | 50.0 | 5.1 | - |
| 2015 | 40.5 | 5.1 | 0.1 | 54.4 | 5.1 | 0.1 |
| 2020 | 38.6 | 5.6 | 0.5 | 59.0 | 4.6 | 0.1 |
| 2025 | 37.7 | 5.0 | 0.8 | 47.1 | 4.1 | 0.5 |

**Table 08A-02.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 358 | 34 | 289 | - | 12.1 | 0.1 | 8.5 |
| 2000 | - | 340 | 13 | 282 | - | 15.2 | 0.1 | 8.0 |
| 2005 | - | 316 | 52 | 289 | - | 12.0 | 0.2 | 8.3 |
| 2010 | 4 | 330 | 50 | 258 | 0.1 | 16.0 | 0.5 | 10.0 |
| 2015 | - | 361 | 132 | 327 | - | 21.4 | 1.6 | 13.4 |
| 2020 | - | 360 | 29 | 317 | - | 22.1 | 0.2 | 11.9 |
| 2025 | - | 358 | 17 | 323 | - | 16.1 | 0.1 | 8.3 |

**Table 08A-02.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 6.3 | 0.2 | 57.1 | 3.3 | 2.9 | 53.1 |
| 2000 | 13.6 | 0.3 | 59.3 | 7.2 | 1.1 | 59.9 |
| 2005 | 16.0 | 0.1 | 40.7 | 6.5 | 1.9 | 57.6 |
| 2010 | 13.0 | 0.2 | 57.4 | 7.1 | 0.9 | 60.0 |
| 2015 | 10.3 | 0.1 | 52.9 | 6.2 | 1.6 | 65.3 |
| 2020 | 8.7 | 0.2 | 48.0 | 7.2 | 2.3 | 62.4 |
| 2025 | 11.6 | 0.1 | 46.8 | 7.0 | 1.8 | 57.5 |

**Table 08A-02.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer/Pronghorn | Rocky Mountain Elk | Shiras Moose | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 4 | 19 | 8 | - |
| 2000 | 1 | 1 | 17 | 14 | - |
| 2005 | 3 | 3 | 27 | 12 | 3 |
| 2010 | 2 | 12 | 22 | 3 | 1 |
| 2015 | 2 | 2 | 11 | 7 | - |
| 2020 | 2 | 1 | 16 | 12 | - |
| 2025 | - | 7 | 21 | 3 | - |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 11.6 (28.7) | 6.7 (16.6) | 44.2 (109.2) | 15.5 (38.3) | - |
| 2005 | 11.6 (28.7) | 7.4 (18.2) | 31.5 (77.8) | 19.4 (47.8) | - |
| 2010 | 13.8 (34.1) | 12.1 (29.8) | 36.8 (91.0) | 12.1 (29.9) | - |
| 2015 | 12.3 (30.5) | 0.7 (1.7) | 17.4 (43.0) | 2.4 (6.0) | - |
| 2020 | 8.7 (21.5) | 0.7 (1.7) | 26.2 (64.6) | 11.6 (28.7) | - |
| 2025 | 5.1 (12.6) | 0.7 (1.7) | 18.1 (44.7) | 2.4 (6.0) | - |

**Table 08A-02.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leucopoa kingii (spike fescue) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 3 | - | 3 | - | 132 | - | 173 | 30 | 10 | 19 | 34 | 171 |
| 2000 | 3 | - | - | - | 149 | 7 | 46 | 21 | 19 | 50 | 41 | 195 |
| 2005 | - | - | 21 | - | 127 | 38 | 98 | 36 | 2 | 33 | 48 | 141 |
| 2010 | - | - | 17 | 4 | 181 | 38 | 72 | 31 | 13 | 58 | 15 | 121 |
| 2015 | - | 15 | 13 | - | 176 | 52 | 46 | 70 | - | 40 | 110 | 169 |
| 2020 | 2 | 10 | 42 | - | 168 | 49 | 130 | 31 | 20 | 15 | 75 | 139 |
| 2025 | 10 | 2 | 33 | - | 210 | 17 | 129 | 1 | 20 | 3 | 30 | 130 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.1 | - | 0.0 | - | 2.7 | - | 5.9 | 0.2 | 0.0 | 0.3 | 0.1 | 2.7 |
| 2000 | 0.0 | - | - | - | 5.5 | 0.0 | 0.7 | 0.2 | 0.4 | 2.9 | 0.3 | 5.2 |
| 2005 | - | - | 0.1 | - | 4.9 | 0.3 | 2.8 | 0.5 | 0.0 | 0.8 | 0.8 | 1.9 |
| 2010 | - | - | 0.4 | 0.1 | 7.4 | 0.2 | 2.0 | 0.9 | 0.1 | 2.3 | 0.2 | 2.5 |
| 2015 | - | 0.4 | 0.9 | - | 7.6 | 0.6 | 1.2 | 1.2 | - | 1.1 | 2.5 | 5.7 |
| 2020 | 0.1 | 0.3 | 0.9 | - | 8.9 | 0.5 | 5.0 | 0.6 | 0.1 | 0.6 | 1.7 | 3.3 |
| 2025 | 0.5 | 0.0 | 0.6 | - | 8.4 | 0.0 | 3.6 | 0.0 | 0.2 | 0.0 | 0.1 | 2.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08A-02.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Arenaria congesta (ballhead sandwort) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Chaetopappa ericoides (rose heath) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium undulatum[a] (wavyleaf thistle) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 3 | 1 | 43 | 25 | 107 | 3 | 28 | 5 | 10 | - | 9 | - | - | - | - |
| 2000 | - | - | - | 2 | 22 | 5 | 61 | 10 | 14 | - | 6 | - | - | - | - | - | 8 |
| 2005 | - | 4 | - | 9 | 12 | 37 | 117 | 5 | 9 | 4 | 13 | - | 4 | - | - | - | 1 |
| 2010 | - | 5 | - | 21 | 14 | 2 | 62 | 6 | 14 | 3 | 15 | 7 | - | - | - | - | 8 |
| 2015 | - | - | - | 85 | 34 | 50 | 105 | 8 | 30 | 5 | 16 | - | - | 2 | - | 5 | 5 |
| 2020 | 3 | 3 | - | 4 | 15 | 18 | 120 | 8 | 41 | - | 10 | - | - | - | 2 | 9 | 1 |
| 2025 | - | 1 | - | - | 15 | 8 | 90 | 17 | 27 | 3 | 11 | - | 5 | - | 1 | 9 | 8 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.0 | 0.0 | 0.3 | 0.1 | 1.2 | 0.0 | 0.2 | 0.0 | 0.1 | - | 0.0 | - | - | - | - |
| 2000 | - | - | - | 0.0 | 0.3 | 0.0 | 0.5 | 0.2 | 0.1 | - | 0.0 | - | - | - | - | - | 0.1 |
| 2005 | - | 0.0 | - | 0.0 | 0.3 | 0.2 | 0.9 | 0.0 | 0.1 | 0.0 | 0.1 | - | 0.0 | - | - | - | 0.0 |
| 2010 | - | 0.0 | - | 0.2 | 0.7 | 0.0 | 0.6 | 0.0 | 0.1 | 0.0 | 0.3 | 0.0 | - | - | - | - | 0.0 |
| 2015 | - | - | - | 0.9 | 0.8 | 0.3 | 1.1 | 0.3 | 0.4 | 0.0 | 0.1 | - | - | 0.0 | - | 0.1 | 0.0 |
| 2020 | 0.1 | 0.0 | - | 0.0 | 0.3 | 0.1 | 0.8 | 0.0 | 0.7 | - | 0.2 | - | - | - | 0.0 | 0.2 | 0.0 |
| 2025 | - | 0.0 | - | - | 0.2 | 0.0 | 0.5 | 0.1 | 0.2 | 0.0 | 0.1 | - | 0.0 | - | 0.0 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erysimum capitatum[a] (sanddune wallflower) | Galium boreale (northern bedstraw) | Heuchera parvifolia (littleleaf alumroot) | Lesquerella parvula (pygmy bladderpod) | Linum lewisii (Lewis flax) | Lithospermum (stoneseed) | Lomatium grayi (Gray's biscuitroot) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Mertensia lanceolata (prairie bluebells) | Microsteris gracilis[a] (slender phlox) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 34 | 27 | - | - | 1 | 8 | 11 | - | - | 8 | - | - | - | - | 3 |
| 2000 | - | 6 | 24 | 55 | - | - | - | 25 | 5 | - | - | 6 | 1 | - | - | 7 | - |
| 2005 | 2 | 4 | 16 | 29 | - | - | 5 | 22 | 6 | 8 | - | 1 | 5 | - | - | 9 | - |
| 2010 | - | 26 | 15 | 30 | - | - | 4 | 25 | - | 1 | - | 13 | 4 | - | 4 | 3 | - |
| 2015 | 7 | - | 30 | 34 | 44 | - | 13 | 46 | 8 | - | - | 6 | 6 | 63 | 1 | 15 | - |
| 2020 | 10 | - | 24 | 37 | 6 | - | 17 | 18 | 10 | - | 1 | 6 | 7 | 49 | - | 3 | - |
| 2025 | 3 | - | 29 | 50 | 4 | 2 | 4 | 4 | - | - | 5 | 8 | 8 | 28 | - | 7 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.1 | 0.6 | - | - | 0.0 | 0.0 | 0.1 | - | - | 0.2 | - | - | - | - | 0.0 |
| 2000 | - | 0.0 | 0.1 | 0.7 | - | - | - | 0.1 | 0.1 | - | - | 0.2 | 0.0 | - | - | 0.1 | - |
| 2005 | 0.0 | 0.0 | 0.1 | 1.0 | - | - | 0.0 | 0.1 | 0.1 | 0.0 | - | 0.0 | 0.2 | - | - | 0.1 | - |
| 2010 | - | 0.2 | 0.1 | 0.7 | - | - | 0.1 | 0.1 | - | 0.0 | - | 0.1 | 0.1 | - | 0.1 | 0.1 | - |
| 2015 | 0.0 | - | 0.2 | 0.6 | 0.4 | - | 0.2 | 0.5 | 0.0 | - | - | 0.0 | 0.2 | 0.4 | 0.0 | 0.2 | - |
| 2020 | 0.1 | - | 0.1 | 0.8 | 0.1 | - | 0.3 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.2 | - | 0.0 | - |
| 2025 | 0.0 | - | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.1 | 0.2 | 0.1 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon humilis (low beardtongue) | Phlox longifolia (longleaf phlox) | Phlox multiflora (flowery phlox) | Physaria acutifolia (sharpleaf twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sedum lanceolatum (spearleaf stonecrop) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | 97 | 85 | 137 | - | - | 21 | - | - | 2 | - | 1 | 8 | 32 |
| 2000 | 41 | 73 | 125 | - | - | 14 | - | 1 | 3 | - | - | 4 | 33 |
| 2005 | 85 | 39 | 127 | - | - | 18 | 36 | - | 1 | - | 8 | - | 17 |
| 2010 | 72 | 34 | 143 | - | - | 23 | 8 | - | - | 6 | 9 | 4 | 2 |
| 2015 | 109 | 56 | 182 | - | - | 18 | - | 2 | 4 | 7 | 19 | 3 | 34 |
| 2020 | 49 | 85 | 182 | - | 2 | 12 | - | 2 | 10 | 1 | 33 | 13 | 26 |
| 2025 | 67 | 84 | 193 | 4 | - | 5 | - | 3 | - | 5 | 3 | 9 | 63 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | 1.1 | 0.4 | 3.9 | - | - | 0.1 | - | - | 0.0 | - | 0.0 | 0.0 | 0.1 |
| 2000 | 0.6 | 0.6 | 3.9 | - | - | 0.1 | - | 0.0 | 0.0 | - | - | 0.1 | 0.1 |
| 2005 | 1.3 | 0.2 | 3.3 | - | - | 0.1 | 0.2 | - | 0.0 | - | 0.0 | - | 0.1 |
| 2010 | 1.1 | 0.3 | 5.1 | - | - | 0.1 | 0.0 | - | - | 0.0 | 0.2 | 0.1 | 0.0 |
| 2015 | 1.3 | 0.3 | 5.9 | - | - | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.3 |
| 2020 | 0.5 | 0.6 | 5.9 | - | 0.0 | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.4 |
| 2025 | 0.3 | 0.2 | 5.2 | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.5 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08A-02.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Pinus flexilis[t] (limber pine) | Pseudotsuga menziesii[t] (Douglas-fir) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 1.8 | 0.9 | - | 20 | 3.5 | 3.1 | 0.3 | - | - | - | 16.6 | 0.3 |
| 2010 | 1.1 | 0.9 | - | 26.5 | 4.3 | 2.6 | 0.1 | 0.2 | - | - | 18.9 | 0.5 |
| 2015 | 1 | 1.1 | 0.5 | 30.7 | 4.5 | 2.4 | 0.1 | - | 0.1 | - | 18.7 | 0.5 |
| 2020 | 1.6 | 1.4 | 0.9 | 33.1 | 3.4 | 2.6 | 0.2 | 0.1 | - | 0.1 | 19.4 | 0.9 |
| 2025 | 1.6 | 0.4 | 1.2 | 28.7 | 2.7 | 1.6 | 0.7 | 0.2 | - | 0.5 | 13.6 | 0.5 |
| year | Quadrat Cover (%) | | | | | | | | | | | |
| 1995 | 1.1 | 1.2 | 0.4 | 19.4 | 3.8 | 2.2 | 0.1 | - | - | - | 13.3 | 0.3 |
| 2000 | 1.8 | 1.0 | 0.7 | 18.9 | 3.3 | 3.6 | 0.4 | 0.0 | - | - | 12.4 | 0.5 |
| 2005 | 1.6 | 1.1 | 0.5 | 18.0 | 3.9 | 3.5 | 0.7 | - | 0.0 | - | 11.1 | 0.4 |
| 2010 | 1.0 | 1.1 | 0.8 | 18.6 | 3.8 | 1.3 | 0.4 | 0.0 | 0.0 | - | 10.2 | 0.4 |
| 2015 | 0.2 | 1.0 | 0.8 | 21.7 | 4.1 | 1.9 | 0.5 | - | 0.1 | - | 14.8 | 0.5 |
| 2020 | 1.1 | 1.2 | 1.1 | 21.3 | 4.2 | 2.2 | 0.3 | 0.2 | - | 0.5 | 11.6 | 0.9 |
| 2025 | 1.3 | 0.6 | 1.1 | 22.7 | 2.8 | 1.6 | 1.6 | 0.1 | - | 0.8 | 10.3 | 0.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08A-02.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 660 | 20 | 49 | 46 | 6 | 42 | 12 | 3 | 100/109 |
| 2000 | 740 | 120 | 46 | 38 | 16 | 35 | 22 | 3 | 65/58 |
| 2005 | 740 | 120 | 51 | 30 | 19 | 11 | 43 | 8 | 64/53 |
| 2010 | 900 | 20 | 44 | 47 | 9 | 40 | 13 | 29 | 52/46 |
| 2015 | 480 | - | 67 | 25 | 8 | 46 | 13 | 13 | 46/44 |
| 2020 | 780 | 20 | 41 | 56 | 3 | 28 | 39 | 15 | 43/41 |
| 2025 | 1200 | - | 28 | 68 | 3 | 8 | 47 | 5 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | 22/27 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/14 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 1740 | 220 | 16 | 79 | 5 | 28 | 1 | 1 | 21/33 |
| 2000 | 1280 | 60 | 16 | 81 | 3 | 2 | 2 | 0 | 21/33 |
| 2005 | 1220 | 140 | 20 | 67 | 13 | 3 | 0 | 12 | 25/32 |
| 2010 | 1100 | 100 | 27 | 67 | 6 | 18 | 11 | 9 | 24/38 |
| 2015 | 1280 | 100 | 8 | 91 | 2 | 55 | 19 | 2 | 17/28 |
| 2020 | 1320 | - | 9 | 91 | 0 | 18 | 32 | 32 | 18/29 |
| 2025 | 680 | - | 12 | 65 | 24 | 50 | 18 | 24 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 25 | 0 | 0 | 30/27 |
| 2000 | 160 | - | 13 | 75 | 13 | 0 | 0 | 0 | 36/45 |
| 2005 | 200 | 60 | 0 | 80 | 20 | 0 | 20 | 20 | 35/52 |
| 2010 | 140 | - | 0 | 100 | 0 | 86 | 0 | 0 | 38/60 |
| 2015 | 140 | - | 0 | 100 | 0 | 86 | 0 | 14 | 33/54 |
| 2020 | 100 | - | 20 | 60 | 20 | 20 | 40 | 40 | 32/55 |
| 2025 | 880 | - | 21 | 66 | 14 | 18 | 21 | 52 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 6880 | 2440 | 45 | 54 | 2 | 47 | 19 | 0 | 65/94 |
| 2000 | 7360 | 1180 | 44 | 50 | 6 | 27 | 41 | 2 | 57/76 |
| 2005 | 7960 | 3420 | 40 | 56 | 4 | 12 | 70 | 3 | 61/82 |
| 2010 | 6620 | 720 | 52 | 48 | 1 | 45 | 14 | 4 | 64/93 |
| 2015 | 7240 | 420 | 32 | 68 | 1 | 43 | 20 | 19 | 60/94 |
| 2020 | 6720 | 380 | 24 | 74 | 2 | 13 | 67 | 10 | 56/94 |
| 2025 | 9300 | - | 22 | 76 | 2 | 23 | 54 | 2 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 4100 | 40 | 5 | 95 | 0 | 0 | 0 | 0 | 31/40 |
| 2000 | 3020 | - | 3 | 92 | 5 | 2 | 0 | 2 | 25/29 |
| 2005 | 2940 | 60 | 8 | 90 | 3 | 18 | 0 | 1 | 31/38 |
| 2010 | 3080 | - | 12 | 87 | 1 | 0 | 0 | 8 | 30/35 |
| 2015 | 3940 | 20 | 7 | 93 | 0 | 3 | 0 | 1 | 30/36 |
| 2020 | 3720 | - | 1 | 86 | 13 | 16 | 16 | 16 | 25/27 |
| 2025 | 3080 | - | 8 | 90 | 2 | 4 | 0 | 2 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 5060 | 180 | 2 | 98 | 0 | 1 | 2 | 0 | 19/28 |
| 2000 | 3880 | 20 | 5 | 94 | 1 | 3 | 0 | 2 | 17/28 |
| 2005 | 3560 | 60 | 2 | 98 | 1 | 10 | 0 | 3 | 18/31 |
| 2010 | 2480 | - | 14 | 86 | 0 | 4 | 0 | 0 | 17/27 |
| 2015 | 3320 | 20 | 5 | 95 | 0 | 3 | 2 | 0 | 15/25 |
| 2020 | 3380 | - | 2 | 97 | 1 | 12 | 5 | 2 | 17/26 |
| 2025 | 2940 | - | 5 | 94 | 1 | 29 | 8 | 1 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 740 | - | 19 | 81 | 0 | 0 | 0 | 0 | 16/14 |
| 2000 | 420 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/19 |
| 2005 | 640 | 80 | 0 | 100 | 0 | 0 | 0 | 0 | 17/26 |
| 2010 | 860 | - | 9 | 91 | 0 | 0 | 0 | 0 | 16/18 |
| 2015 | 560 | - | 18 | 82 | 0 | 0 | 0 | 0 | 17/17 |
| 2020 | 600 | - | 7 | 93 | 0 | 0 | 0 | 0 | 15/12 |
| 2025 | 2100 | - | 2 | 98 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/11 |
| 2000 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/15 |
| 2005 | 160 | - | 50 | 50 | 0 | 0 | 0 | 0 | 7/13 |
| 2010 | 380 | - | 68 | 32 | 0 | 0 | 0 | 0 | 11/9 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 1080 | - | 100 | 0 | 0 | 0 | 0 | 0 | 6/10 |
| 2025 | 720 | - | 6 | 89 | 6 | 0 | 0 | 6 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 10/9 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/11 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/10 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/8 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus flexilis[t] -- (limber pine) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pseudotsuga menziesii[t] -- (Douglas-fir) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 60 | - | 100 | 0 | 0 | 0 | 0 | 33 | - / - |
| 2025 | 80 | - | 75 | 25 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 5140 | 180 | 16 | 84 | 0 | 6 | 4 | 0 | 30/79 |
| 2000 | 4080 | 160 | 7 | 90 | 3 | 2 | 0 | 10 | 28/62 |
| 2005 | 6800 | 140 | 22 | 77 | 1 | 4 | 1 | 1 | 27/55 |
| 2010 | 6240 | 80 | 28 | 72 | 0 | 21 | 0 | 2 | 29/56 |
| 2015 | 8220 | 140 | 22 | 78 | 0 | 6 | 1 | 0 | 26/49 |
| 2020 | 7720 | 20 | 27 | 73 | 0 | 27 | 3 | 2 | 26/41 |
| 2025 | 7660 | - | 13 | 86 | 1 | 36 | 20 | 1 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 880 | 80 | 14 | 86 | 0 | 16 | 0 | 0 | 21/21 |
| 2000 | 780 | 20 | 13 | 74 | 13 | 15 | 0 | 3 | 19/21 |
| 2005 | 780 | 20 | 41 | 59 | 0 | 13 | 0 | 0 | 20/27 |
| 2010 | 780 | - | 36 | 64 | 0 | 15 | 0 | 3 | 21/30 |
| 2015 | 760 | - | 13 | 87 | 0 | 0 | 3 | 0 | 20/25 |
| 2020 | 980 | - | 4 | 88 | 8 | 14 | 18 | 12 | 22/29 |
| 2025 | 760 | - | 13 | 87 | 0 | 18 | 3 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

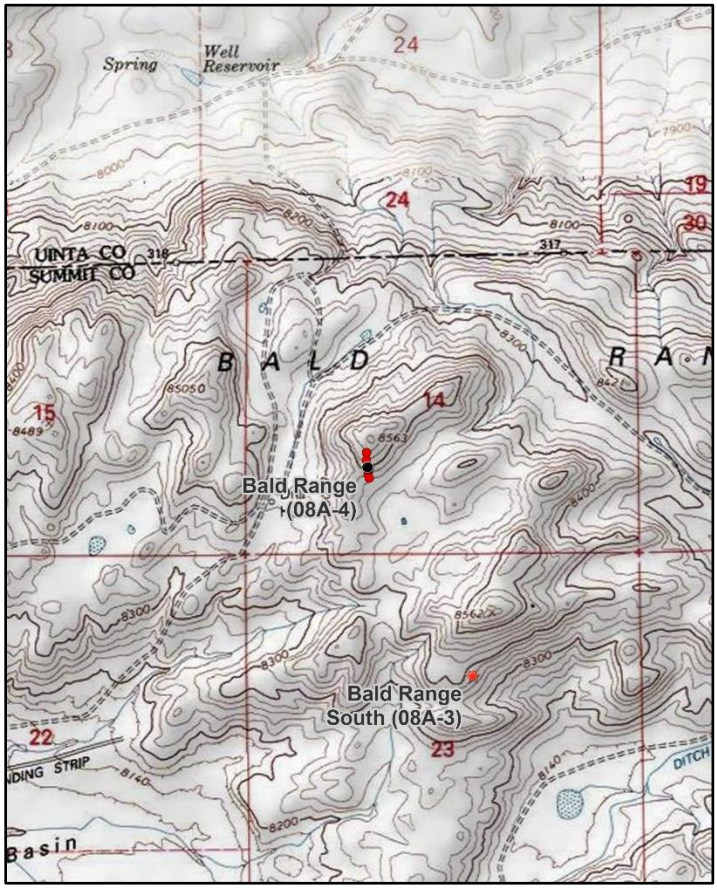
**Table 08A-02.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

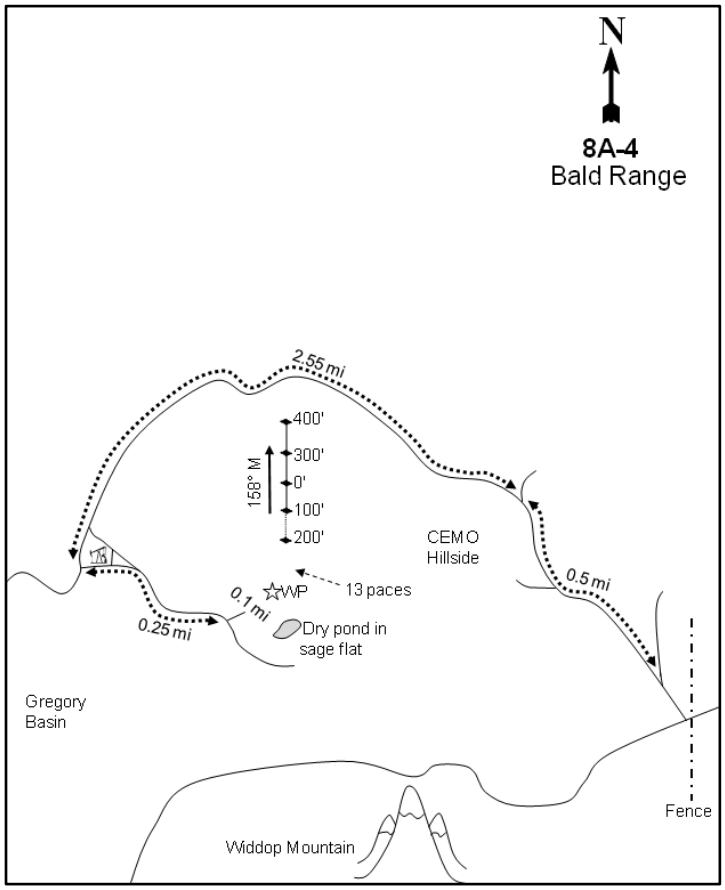
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus flexilis (limber pine) | | | | | | | |
| 2025 | 3 | - | 100 | - | - | - | 2.0 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2020 | 36 | - | 100 | - | - | - | 1.9 |
| 2025 | 56 | 14 | 79 | 7 | - | - | 2.5 |

**Table 08A-02.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 14.6 | 15.0 | 24.2 | 0.0 | 10.0 | 0.0 | **93.8** | Excellent |
| 2000 | 30.0 | 13.6 | 13.6 | 30.0 | 0.0 | 10.0 | 0.0 | **97.2** | Excellent |
| 2005 | 30.0 | 13.9 | 15.0 | 24.1 | 0.0 | 10.0 | 0.0 | **93.0** | Excellent |
| 2010 | 30.0 | 14.9 | 15.0 | 30.0 | -0.1 | 10.0 | 0.0 | **99.8** | Excellent |
| 2015 | 30.0 | 14.8 | 13.5 | 30.0 | 0.0 | 10.0 | 0.0 | **98.3** | Excellent |
| 2020 | 30.0 | 14.6 | 12.0 | 30.0 | 0.0 | 10.0 | 0.0 | **96.6** | Excellent |
| 2025 | 30.0 | 14.3 | 9.5 | 30.0 | 0.0 | 10.0 | 0.0 | **93.8** | Excellent |

# BALD RANGE - STUDY NO. 08A-4




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Hoop Lake NW; Township 3N, Range 16E, Section 14 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 575857 East 4537929 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9776 |
| Transect Bearing | 158° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Hoop Lake-Beaver Creek Road, turn east toward Gregory Basin. Go 0.6 miles to a gate onto private land. Continue through the gate past the cabins for 1.1 miles to a fence. Go along a canal 0.5 miles to the four-way intersection. Proceed east 0.7 miles to a cattle guard at the boundary, and then 0.9 more miles to the eastern Forest Service boundary fence. Continue 1.8 miles to another fence. Just on the west side of the fence, the road makes a 45 degree turn to the left. Follow the jeep road northwest up the drainage about 0.5 miles to a fork at the top. Continue on the main jeep road 2.6 miles to an old drill pad. Just past the pad, turn left onto a faint road that goes east for about 0.3 miles and continue to the top of a ridge. From the ridge, walk about 0.1 miles along the edge of a sage and mahogany community to a rock cairn. From there, the 200-foot baseline stake is 13 paces north. The 0-foot baseline stake is marked by browse tag #9076.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | No data |
| Elevation | 8,470ft (2,582m) |
| Aspect | South |
| Slope | 21% |
| Sample Dates | 09/01/1995, 08/01/2000, 08/03/2005, 08/03/2010, 07/08/2015, 07/13/2020, 07/07/2025 |

## Wildlife Habitat and Vegetation History

**Table 08A-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |
| Pronghorn | crucial | year-long |

**Table 08A-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Alderleaf Mountain Mahogany | No Encroachment |
| 1995 | Alderleaf Mountain Mahogany | No Encroachment |
| 2000 | Alderleaf Mountain Mahogany | No Encroachment |
| 2005 | Alderleaf Mountain Mahogany | No Encroachment |
| 2010 | Alderleaf Mountain Mahogany | No Encroachment |
| 2015 | Alderleaf Mountain Mahogany | No Encroachment |
| 2020 | Alderleaf Mountain Mahogany | No Encroachment |
| 2025 | Alderleaf Mountain Mahogany | No Encroachment |

## Site Notes

At the time the study was established in 1988, the area was exceptionally dry. Water often limits livestock grazing in the area. The area is managed by the Utah State Institutional Trust Lands Administration (SITLA) with cattle use in the spring, when the nearby stock ponds contain water. Elk sign is concentrated on the rocky, windswept ridges where they bed down. It was noted in the 2015 sample year that insects infested many of the alderleaf mountain mahogany (*Cercocarpus montanus*) plants.

## Soils

**Table 08A-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.6 | 57.6 | 20.4 | 22.0 | 2.9 | 4.6 | 102.4 | 0.6 | 08/16/1995 |
| Sandy Loam | 7.5 | 58.4 | 24.1 | 17.6 | 3.3 | 3.6 | 112.0 | 0.9 | 08/01/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1988, the vegetation on this site has remained in a stable state as a mixed mountain brush plant community with alderleaf mountain mahogany (*Cercocarpus montanus*) as the dominant shrub species (Photos, Pre-1992 Data, Table 08A-04.12, Table 08A-04.13). The herbaceous understory has remained diverse and abundant over the duration of the study. Perennial grasses, particularly Ross' sedge (*Carex rossii*) and/or bluebunch wheatgrass (*Pseudoroegneria spicata*), have provided a majority of the herbaceous cover in all sample years. Perennial forbs have contributed moderate cover, with spiny phlox (*Phlox hoodii*), sulphur-flower buckwheat (*Eriogonum umbellatum*), and plains milkvetch (*Astragalus gilviflorus*) as the dominant species in 2025 (Table 08A-04.7, Table 08A-04.10, Table 08A-04.11). Without a major disturbance, this site will likely remain in this or a similar state in future sample years.

This site likely serves as adequate summer range for mule deer and elk due to the abundant and/or diverse shrub and herbaceous components (Table 08A-04.7, Table 08A-04.10, Table 08A-04.11, Table 08A-04.12). Deer presence has been low in most sample years, except in 2020 when presence was considered high. Elk presence has been high in most sample years, but it was moderate in 2015 and 2025. Cattle presence has remained low since 2000 (Table 08A-04.9). In most sample years, 70% or more of highly preferred browse plants (like alderleaf mountain mahogany) have consistently shown signs of moderate to heavy use. On-site observations state that there was light utilization (10-20%) of the perennial grass community during the most recent sample year (2025). These observations also stated that the herbaceous communities appeared to have good seed production, but that spiny phlox displayed some drought effects (Photos).

## Trend Summary Tables

**Table 08A-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 25.6 | 1.1 | - | - | - | - |
| 2000 | 18.7 | 1.1 | - | - | - | - |
| 2005 | 22.7 | 2.5 | - | 29.3 | 1.4 | - |
| 2010 | 25.2 | 1.8 | - | 35.1 | 2.7 | - |
| 2015 | 30.2 | 2.1 | - | 39.1 | 3.5 | - |
| 2020 | 27.8 | 4.0 | - | 32.6 | 3.5 | - |
| 2025 | 26.8 | 3.4 | - | 35.1 | 2.4 | - |

**Table 08A-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 339 | 102 | 217 | - | 10.5 | 0.5 | 3.6 |
| 2000 | - | 348 | 17 | 213 | - | 14.9 | 0.1 | 5.6 |
| 2005 | - | 301 | 11 | 265 | - | 8.4 | 0.4 | 4.5 |
| 2010 | - | 315 | 11 | 255 | - | 12.7 | 0.4 | 6.8 |
| 2015 | - | 339 | 9 | 252 | - | 19.3 | 0.1 | 6.8 |
| 2020 | - | 356 | 9 | 306 | - | 14.2 | 0.0 | 7.6 |
| 2025 | - | 347 | 24 | 285 | - | 11.6 | 0.1 | 7.2 |

**Table 08A-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 13.1 | 0.2 | 39.4 | 15.4 | 8.0 | 35.1 |
| 2000 | 21.9 | 0.1 | 36.7 | 16.8 | 6.7 | 39.6 |
| 2005 | 26.2 | 0.0 | 25.6 | 21.0 | 5.1 | 34.9 |
| 2010 | 17.5 | 0.2 | 33.3 | 25.0 | 4.9 | 45.5 |
| 2015 | 19.9 | 0.2 | 36.7 | 14.1 | 6.6 | 49.1 |
| 2020 | 5.3 | 0.1 | 33.1 | 31.1 | 5.3 | 45.8 |
| 2025 | 23.0 | 0.1 | 35.3 | 16.3 | 7.0 | 39.5 |

**Table 08A-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer/Pronghorn | Rocky Mountain Elk | Shiras Moose | Rabbit | Domestic Sheep |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1995 | 2 | - | 8 | 21 | - | 1 | - |
| 2000 | 1 | - | 2 | 24 | - | - | - |
| 2005 | 1 | - | 2 | 30 | 1 | - | - |
| 2010 | - | - | 11 | 26 | - | 1 | - |
| 2015 | 2 | - | 6 | 14 | - | 3 | - |
| 2020 | 2 | - | 15 | 11 | - | - | - |
| 2025 | 2 | - | 4 | 32 | 1 | 1 | - |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | 2.2 (5.4) | - | 3.4 (8.3) | 40.2 (99.3) | - | - | - |
| 2005 | 4.4 (10.8) | - | 2.0 (5.0) | 75.1 (185.4) | 1.0 (2.4) | - | 2.0 (5.0) |
| 2010 | 3.6 (9.0) | - | 11.4 (28.1) | 48.3 (119.2) | - | - | 0.7 (1.7) |
| 2015 | 1.5 (3.6) | - | 4.0 (9.9) | 36.8 (91.0) | - | - | - |
| 2020 | 4.4 (10.8) | - | 53.0 (130.8) | 77.7 (192.0) | - | - | - |
| 2025 | 1.5 (3.6) | 8.7 (21.5)* | - | 22.8 (56.3) | - | - | - |

*Pellets per acre (ha)

**Table 08A-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leucopoa kingii (spike fescue) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 67 | - | 153 | 55 | 28 | 24 | - | 8 | 19 | 241 |
| 2000 | 5 | - | 136 | 120 | 20 | 1 | 9 | 14 | 10 | 211 |
| 2005 | 57 | 1 | 147 | 53 | 41 | 19 | 28 | 8 | 4 | 163 |
| 2010 | 47 | 1 | 139 | 126 | 41 | 41 | 34 | 12 | - | 61 |
| 2015 | 27 | - | 152 | 84 | 61 | 52 | 18 | 3 | 12 | 216 |
| 2020 | 34 | 6 | 150 | 62 | 78 | 26 | 42 | 1 | 10 | 226 |
| 2025 | 13 | 9 | 178 | 181 | 88 | 33 | 31 | 8 | 1 | 49 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 1.9 | - | 3.6 | 0.4 | 0.2 | 0.2 | - | 0.0 | 0.2 | 4.0 |
| 2000 | 0.2 | - | 5.1 | 1.2 | 1.0 | 0.0 | 0.3 | 0.4 | 0.1 | 6.7 |
| 2005 | 0.6 | 0.0 | 4.0 | 0.3 | 0.7 | 0.3 | 0.3 | 0.1 | 0.0 | 2.2 |
| 2010 | 1.1 | 0.0 | 3.6 | 2.4 | 1.2 | 1.3 | 0.7 | 0.2 | - | 2.1 |
| 2015 | 0.9 | - | 5.7 | 2.6 | 2.3 | 0.9 | 0.3 | 0.2 | 0.1 | 6.3 |
| 2020 | 0.6 | 0.0 | 5.6 | 0.9 | 1.7 | 0.7 | 0.4 | 0.0 | 0.1 | 4.2 |
| 2025 | 0.2 | 0.1 | 5.8 | 1.3 | 1.8 | 0.7 | 0.8 | 0.3 | 0.0 | 0.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08A-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Arabis demissa (nodding rockcress) | Arenaria congesta (ballhead sandwort) | Arenaria hookeri (Hooker's sandwort) | Astragalus gilviflorus (plains milkvetch) | Astragalus purshii (woollypod milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chaetopappa ericoides (rose heath) | Chenopodium atrovirens[a] (pinyon goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium undulatum[a] (wavyleaf thistle) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 9 | 3 | - | - | - | - | 54 | 1 | - | - | 1 | - | 10 | 13 | 1 | - |
| 2000 | - | 6 | - | - | 15 | - | 33 | 7 | - | - | - | 1 | - | - | 17 | 3 | - |
| 2005 | - | 52 | 2 | - | 4 | 5 | 8 | 6 | 13 | - | 9 | 1 | - | - | 9 | - | - |
| 2010 | - | 6 | - | - | 10 | - | 66 | 5 | - | - | 13 | 13 | - | 2 | 9 | 8 | - |
| 2015 | - | - | 1 | - | 5 | - | 68 | 9 | 8 | 1 | 6 | 3 | - | 1 | 5 | 8 | - |
| 2020 | - | 11 | 4 | - | 7 | - | 97 | 6 | 3 | - | 17 | 3 | - | - | 3 | 10 | - |
| 2025 | 5 | 6 | - | 3 | 7 | - | 84 | 7 | 2 | - | 15 | 1 | 0 | - | - | - | 17 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.2 | 0.0 | - | - | - | - | 0.6 | 0.0 | - | - | 0.0 | - | 0.1 | 0.1 | 0.0 | - |
| 2000 | - | 0.0 | - | - | 0.2 | - | 0.6 | 0.1 | - | - | - | 0.0 | - | - | 0.1 | 0.0 | - |
| 2005 | - | 0.5 | 0.0 | - | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | - | 0.3 | - | - |
| 2010 | - | 0.5 | - | - | 0.1 | - | 1.3 | 0.0 | - | - | 0.0 | 0.1 | - | 0.0 | 0.4 | 0.0 | - |
| 2015 | - | - | 0.0 | - | 0.0 | - | 1.6 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.0 | - |
| 2020 | - | 0.1 | 0.0 | - | 0.0 | - | 1.8 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - |
| 2025 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 1.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Descurainia californica[a] (Sierra tansymustard) | Descurainia pinnata[a] (western tansymustard) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erysimum capitatum[a] (sanddune wallflower) | Hackelia patens (spotted stickseed) | Heterotheca villosa (hairy false goldenaster) | Hymenoxys richardsonii (pingue rubberweed) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Lesquerella parvula (pygmy bladderpod) | Linum lewisii (Lewis flax) | Lithospermum incisum (narrowleaf stoneseed) | Lomatium (desertparsley) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Mertensia lanceolata (prairie bluebells) | Packera multilobata (lobeleaf groundsel) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 82 | 8 | - | - | - | - | 1 | 3 | 80 | - | 6 | - | - | 6 | - | - |
| 2000 | - | - | 64 | - | 7 | 1 | 3 | - | - | 6 | - | 2 | - | 8 | 11 | - | 13 |
| 2005 | - | 2 | 44 | - | - | - | - | - | - | 9 | 3 | 8 | - | 18 | 9 | - | 7 |
| 2010 | - | - | 54 | - | 3 | 3 | - | - | - | 7 | 3 | 10 | - | 9 | 7 | - | 9 |
| 2015 | - | - | 27 | 3 | 1 | - | - | - | - | 31 | 3 | - | - | 17 | 5 | - | 2 |
| 2020 | - | - | 26 | - | - | 1 | 8 | - | 6 | 8 | - | 3 | - | 5 | 21 | - | 3 |
| 2025 | 3 | 18 | 54 | - | - | - | - | - | - | 14 | - | 7 | 1 | 8 | 20 | 1 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.3 | 0.1 | - | - | - | - | 0.0 | 0.0 | 0.2 | - | 0.0 | - | - | 0.1 | - | - |
| 2000 | - | - | 1.5 | - | 0.3 | 0.0 | 0.1 | - | - | 0.0 | - | 0.0 | - | 0.0 | 0.1 | - | 0.0 |
| 2005 | - | 0.0 | 1.4 | - | - | - | - | - | - | 0.0 | 0.0 | 0.1 | - | 0.3 | 0.1 | - | 0.0 |
| 2010 | - | - | 0.9 | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.1 | - | 0.1 |
| 2015 | - | - | 0.8 | 0.0 | 0.0 | - | - | - | - | 0.1 | 0.0 | - | - | 0.1 | 0.1 | - | 0.0 |
| 2020 | - | - | 0.5 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.1 | - | 0.0 |
| 2025 | 0.0 | 0.0 | 1.4 | - | - | - | - | - | - | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Stenotus acaulis (stemless mock goldenweed) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | unknown perennial forb (unknown forb) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | - | 87 | 81 | - | - | - | - | 17 | - | - | 7 | - | 33 |
| 2000 | - | 38 | 69 | 29 | - | - | - | 27 | - | - | 5 | - | 18 |
| 2005 | - | 67 | 75 | 24 | 38 | - | 1 | - | - | - | 14 | 13 | 34 |
| 2010 | 10 | 70 | 83 | 34 | 6 | - | 7 | 8 | - | - | 15 | - | - |
| 2015 | 3 | 96 | 77 | 66 | 3 | - | 1 | 7 | 4 | 7 | 10 | - | 18 |
| 2020 | 1 | 111 | 115 | 86 | 15 | 3 | - | 11 | - | 14 | 19 | - | 35 |
| 2025 | - | 67 | 87 | 74 | - | 3 | - | - | - | 3 | 33 | - | 71 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | - | 0.5 | 1.2 | - | - | - | - | 0.4 | - | - | 0.0 | - | 0.2 |
| 2000 | - | 0.3 | 1.3 | 0.1 | - | - | - | 0.6 | - | - | 0.0 | - | 0.2 |
| 2005 | - | 0.6 | 0.7 | 0.1 | 0.1 | - | 0.0 | - | - | - | 0.2 | 0.1 | 0.1 |
| 2010 | 0.2 | 1.2 | 1.3 | 0.1 | 0.1 | - | 0.0 | 0.0 | - | - | 0.5 | - | - |
| 2015 | 0.0 | 1.4 | 1.4 | 0.3 | 0.0 | - | 0.0 | 0.2 | 0.0 | 0.0 | 0.3 | - | 0.2 |
| 2020 | 0.0 | 1.2 | 1.9 | 0.6 | 0.1 | 0.0 | - | 0.5 | - | 0.0 | 0.1 | - | 0.4 |
| 2025 | - | 0.9 | 1.7 | 0.7 | - | 0.0 | - | - | - | 0.0 | 0.3 | - | 0.5 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08A-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Linanthus pungens (granite prickly phlox) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.2 | - | 1.9 | 25.5 | 0.9 | 0.3 | 0.3 | - | 1.4 | 0.2 |
| 2010 | 0.6 | - | 2.9 | 28.5 | 1.6 | 0.5 | 0.6 | 0.2 | 2.6 | 0.3 |
| 2015 | 0.4 | - | 3.6 | 30.2 | 2 | 0.3 | 1.1 | - | 4.6 | 0.4 |
| 2020 | - | - | 2.3 | 27 | 1.2 | 0.7 | 2.2 | - | 2.6 | 0.1 |
| 2025 | 0.9 | - | 2.4 | 28.3 | 1.3 | 0.3 | 0.8 | - | 3.2 | 0.3 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | - | 0.0 | 3.3 | 21.3 | 0.5 | - | 0.4 | - | 0.9 | 0.2 |
| 2000 | - | - | 1.3 | 16.1 | 0.8 | 0.1 | 0.1 | - | 1.2 | 0.2 |
| 2005 | 0.0 | 0.1 | 2.0 | 18.9 | 1.0 | 0.4 | 1.3 | 0.0 | 1.3 | 0.2 |
| 2010 | 0.0 | 0.1 | 1.8 | 21.2 | 0.9 | 0.8 | 0.5 | 0.2 | 1.3 | 0.3 |
| 2015 | 0.0 | - | 2.6 | 25.0 | 1.0 | 0.5 | 0.7 | - | 2.0 | 0.4 |
| 2020 | 0.4 | - | 2.8 | 22.0 | 1.2 | 0.2 | 2.4 | - | 2.4 | 0.3 |
| 2025 | 0.0 | - | 1.7 | 21.8 | 1.6 | 0.6 | 1.4 | - | 2.8 | 0.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08A-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 50/88 |
| 2000 | 20 | - | 0 | 100 | 0 | 100 | 0 | 100 | 78/158 |
| 2005 | 60 | - | 0 | 100 | 0 | 33 | 67 | 0 | 42/92 |
| 2010 | 140 | 20 | 57 | 43 | 0 | 57 | 0 | 0 | 75/125 |
| 2015 | 100 | - | 20 | 80 | 0 | 0 | 20 | 0 | 54/80 |
| 2020 | 120 | - | 33 | 67 | 0 | 17 | 33 | 0 | 59/110 |
| 2025 | 180 | - | 33 | 67 | 0 | 33 | 33 | 0 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 100 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 6/13 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/21 |
| 2010 | 40 | - | 0 | 100 | 0 | 50 | 50 | 0 | 18/31 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/17 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 2300 | 60 | 2 | 91 | 7 | 35 | 6 | 4 | 22/39 |
| 2000 | 2340 | 100 | 9 | 78 | 13 | 5 | 1 | 5 | 15/30 |
| 2005 | 1700 | 60 | 19 | 69 | 12 | 5 | 6 | 4 | 17/37 |
| 2010 | 1440 | - | 6 | 81 | 14 | 26 | 1 | 10 | 22/35 |
| 2015 | 1600 | 180 | 10 | 85 | 5 | 40 | 36 | 12 | 18/40 |
| 2020 | 1540 | 20 | 16 | 74 | 10 | 8 | 34 | 9 | 21/42 |
| 2025 | 1340 | - | 25 | 55 | 19 | 16 | 6 | 52 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 16/32 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 3340 | 320 | 25 | 75 | 1 | 59 | 25 | 17 | 73/121 |
| 2000 | 3560 | 160 | 21 | 71 | 7 | 22 | 69 | 6 | 74/112 |
| 2005 | 3720 | 1440 | 40 | 56 | 4 | 11 | 66 | 3 | 75/117 |
| 2010 | 3600 | 520 | 41 | 57 | 2 | 46 | 6 | 2 | 81/122 |
| 2015 | 4700 | 80 | 28 | 72 | 1 | 34 | 49 | 30 | 62/96 |
| 2020 | 3920 | 100 | 14 | 83 | 4 | 15 | 72 | 22 | 61/101 |
| 2025 | 4920 | - | 24 | 70 | 6 | 13 | 83 | 6 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 800 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/39 |
| 2000 | 1220 | - | 2 | 82 | 16 | 3 | 0 | 13 | 16/25 |
| 2005 | 1020 | - | 14 | 80 | 6 | 53 | 4 | 4 | 21/34 |
| 2010 | 940 | - | 0 | 100 | 0 | 0 | 0 | 4 | 26/37 |
| 2015 | 960 | 20 | 6 | 94 | 0 | 0 | 2 | 0 | 25/41 |
| 2020 | 740 | - | 11 | 89 | 0 | 0 | 3 | 0 | 23/36 |
| 2025 | 1300 | 20 | 25 | 75 | 0 | 8 | 0 | 0 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/37 |
| 2000 | 600 | - | 23 | 77 | 0 | 0 | 0 | 0 | 15/23 |
| 2005 | 740 | - | 30 | 68 | 3 | 0 | 0 | 3 | 14/29 |
| 2010 | 580 | 20 | 7 | 93 | 0 | 0 | 0 | 0 | 13/22 |
| 2015 | 460 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/19 |
| 2020 | 460 | - | 30 | 70 | 0 | 26 | 0 | 0 | 15/22 |
| 2025 | 420 | - | 33 | 67 | 0 | 24 | 38 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 480 | - | 8 | 92 | 0 | 0 | 0 | 0 | 14/15 |
| 2000 | 800 | - | 3 | 98 | 0 | 0 | 0 | 5 | 13/14 |
| 2005 | 1580 | 40 | 5 | 94 | 1 | 0 | 0 | 1 | 14/21 |
| 2010 | 1400 | - | 3 | 97 | 0 | 0 | 0 | 1 | 18/23 |
| 2015 | 2480 | 320 | 18 | 82 | 0 | 0 | 0 | 3 | 15/19 |
| 2020 | 6360 | - | 11 | 89 | 0 | 0 | 0 | 0 | 14/17 |
| 2025 | 1920 | 20 | 15 | 63 | 23 | 0 | 0 | 26 | - / - |

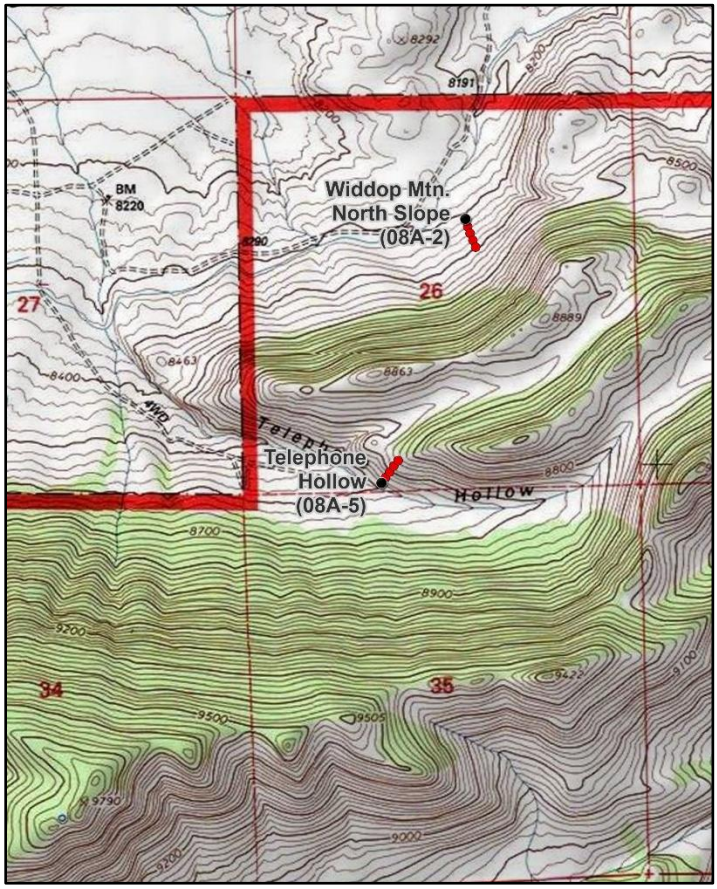
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 100 | 11/17 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 5/3 |
| 2010 | 200 | 180 | 20 | 80 | 0 | 0 | 0 | 0 | 9/10 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | 14/13 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/7 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/5 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/8 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/8 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 620 | 20 | 16 | 84 | 0 | 3 | 10 | 0 | 25/69 |
| 2000 | 580 | - | 0 | 93 | 7 | 0 | 0 | 24 | 29/54 |
| 2005 | 680 | - | 27 | 71 | 3 | 6 | 0 | 0 | 27/70 |
| 2010 | 600 | - | 20 | 80 | 0 | 3 | 3 | 0 | 32/74 |
| 2015 | 940 | 20 | 13 | 87 | 0 | 6 | 2 | 0 | 27/61 |
| 2020 | 740 | - | 16 | 84 | 0 | 0 | 0 | 0 | 27/66 |
| 2025 | 900 | - | 13 | 84 | 2 | 33 | 22 | 2 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 300 | - | 0 | 100 | 0 | 7 | 0 | 0 | 17/26 |
| 2000 | 380 | - | 5 | 84 | 11 | 16 | 5 | 5 | 11/23 |
| 2005 | 360 | - | 11 | 83 | 6 | 33 | 22 | 11 | 14/22 |
| 2010 | 340 | 20 | 53 | 41 | 6 | 24 | 0 | 6 | 15/21 |
| 2015 | 420 | 20 | 5 | 91 | 5 | 0 | 5 | 0 | 15/22 |
| 2020 | 360 | - | 11 | 89 | 0 | 17 | 6 | 0 | 15/24 |
| 2025 | 320 | - | 6 | 88 | 6 | 13 | 19 | 6 | - / - |

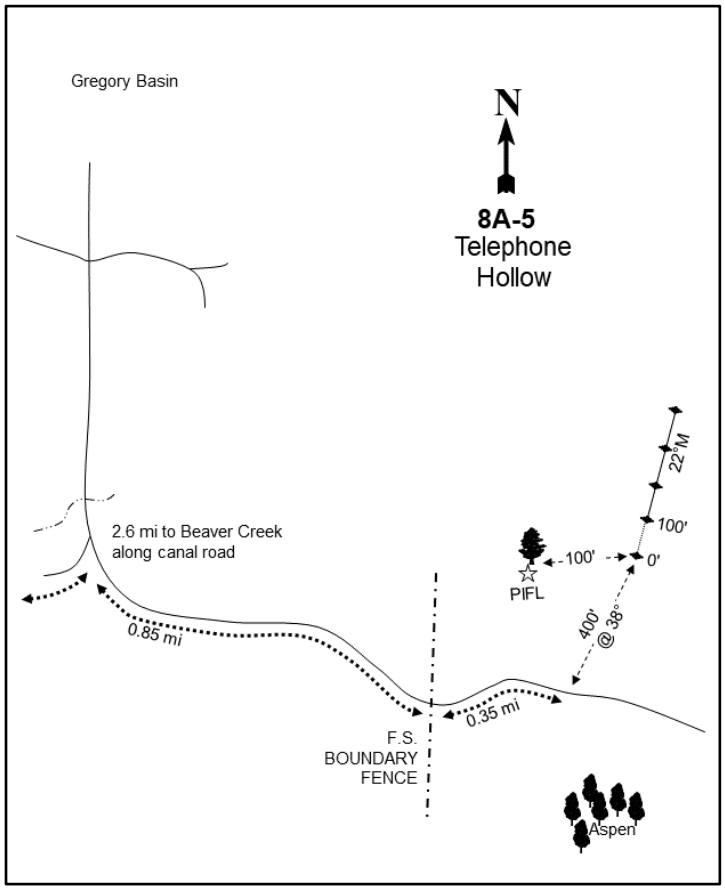
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13A-01.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 14.5 | 10.6 | 21.1 | 0.0 | 7.3 | 0.0 | **83.5** | Good |
| 2000 | 27.1 | 12.7 | 9.5 | 29.9 | 0.0 | 10.0 | 0.0 | **89.2** | Good-Excellent |
| 2005 | 30.0 | 13.7 | 15.0 | 16.8 | 0.0 | 9.1 | 0.0 | **84.6** | Good |
| 2010 | 30.0 | 14.1 | 15.0 | 25.3 | 0.0 | 10.0 | 0.0 | **94.4** | Excellent |
| 2015 | 30.0 | 14.7 | 12.0 | 30.0 | 0.0 | 10.0 | 0.0 | **96.7** | Excellent |
| 2020 | 30.0 | 13.8 | 7.2 | 28.5 | 0.0 | 10.0 | 0.0 | **89.5** | Good-Excellent |
| 2025 | 30.0 | 13.0 | 11.7 | 23.2 | 0.0 | 10.0 | 0.0 | **87.9** | Good |

# TELEPHONE HOLLOW - STUDY NO. 08A-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Hoop Lake NW; Township 3N, Range 16E, Section 26 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 575966 East 4534457 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7148 |
| Transect Bearing | 22° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Hoop Lake Road along Beaver Creek and the intersection that leads to the Hole in the Rock Guard Station, proceed east on the road to Telegraph Hollow. Go 2.6 miles along a canal road all the way to Telegraph Hollow. Turn south and drive 0.85 miles to a gate at the Forest Service boundary. Go through the gate and continue for 0.35 miles. Stop across from the skeleton of lone limber pine (*Pinus flexilis*) tree on the bottom of the south-facing slope. The 0-foot stake is approximately 100 feet to the east of the lone limber pine skeleton. There is a red browse tag, #7148, attached to the green fence post marking the 0-foot end of the baseline.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | BURNT FK |
| Elevation | 8,700ft (2,652m) |
| Aspect | South |
| Slope | 38-40% |
| Sample Dates | 08/29/1995, 08/03/2000, 08/02/2005, 08/10/2010, 07/07/2015, 08/04/2021, 07/09/2025 |

**Table 08A-05.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Telephone Hollow Lop and Scatter | 2536 | September 2014 | 303 |

## Wildlife Habitat and Vegetation History

**Table 08A-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | winter |

**Table 08A-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Alderleaf Mountain Mahogany | NA |
| 1995 | Alderleaf Mountain Mahogany | NA |
| 2000 | Alderleaf Mountain Mahogany | NA |
| 2005 | Alderleaf Mountain Mahogany | NA |
| 2010 | Alderleaf Mountain Mahogany | NA |
| 2015 | Alderleaf Mountain Mahogany | NA |
| 2021 | Alderleaf Mountain Mahogany | NA |
| 2025 | Alderleaf Mountain Mahogany | NA |

## Site Notes

At the elevation of the study site, the valley is generally covered by snow throughout the winter and much of the spring. These south slopes are important to wintering elk, and are also commonly used by moose and deer. Thermal cover is provided by conifer on the nearby north-facing slopes. Cattle graze the area as part of the Burnt Fork allotment, but they typically graze mostly in the seeded hollow at the base of the slope. It was noted in the 2015 sample year that insects infested many of the alderleaf mountain mahogany (*Cercocarpus montanus*) plants.

## Soils

**Table 08A-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.6 | 50.9 | 23.1 | 26.0 | 3.2 | 4.5 | 48.0 | 0.5 | 08/29/1995 |
| Loam | 7.4 | 49.4 | 33.0 | 17.6 | 4.1 | 2.8 | 35.2 | 0.6 | 08/03/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1988, the vegetation on this site has existed as a mixed mountain brush plant community type with alderleaf mountain mahogany (*Cercocarpus montanus*) as the dominant shrub species (Photos, Pre-1992 Data, Table 08A-05.12, Table 08A-05.13). The herbaceous understory has remained diverse and abundant over the study years, with perennial grasses and forbs providing much of the cover (Table 08A-05.7, Table 08A-05.10, Table 08A-05.11). Barring the occurrence of a major disturbance, this site will likely remain in this or a similar state in the future. Some conifer encroachment is occurring on this site as of 2025, but this is likely not an immediate threat.

This site likely serves as adequate summer range for mule deer and elk due to the abundant and/or diverse shrub and herbaceous components (Table 08A-05.10, Table 08A-05.11, Table 08A-05.12). Deer presence has been low in most sample years except 2010 and 2021 (when presence was considered to be moderate). During the 2024/25 winter season the area had nearby occurrences of dispersed and collared mule deer (Wildlife Migration Initiative). Elk presence has has been moderate in most sample years, but it was low in 2015. Cattle presence has remained absent to low since 2000 (Table 08A-05.9). In most sample years, 80% or more of highly preferred browse plants (like alderleaf mountain mahogany) have consistently shown signs of moderate to heavy use (Photos, Table 08A-05.13). On-site observations stated that there was little to no utilization of the herbaceous community during the most recent sample year (2025) and that the herbaceous communities appeared to have good seed production. These observations also state that the preferred shrub community displayed some good primary growth.

## Trend Summary Tables

**Table 08A-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 19.6 | 0.6 | - | - | - | - |
| 2000 | 20.1 | 3.0 | - | - | - | - |
| 2005 | 23.4 | 2.7 | 0.0 | 28.4 | 4.1 | 0.5 |
| 2010 | 20.8 | 2.1 | 2.2 | 33.2 | 3.3 | 3.1 |
| 2015 | 23.9 | 4.2 | - | 32.5 | 5.1 | - |
| 2021 | 25.0 | 6.3 | 0.0 | 32.3 | 6.0 | 0.2 |
| 2025 | 28.6 | 2.9 | 0.0 | 34.0 | 2.1 | - |

**Table 08A-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 329 | 52 | 260 | - | 9.0 | 0.4 | 4.2 |
| 2000 | - | 323 | 28 | 252 | - | 12.2 | 0.5 | 6.8 |
| 2005 | - | 292 | 5 | 272 | - | 8.7 | 0.3 | 7.9 |
| 2010 | - | 290 | 16 | 287 | - | 6.2 | 0.1 | 5.5 |
| 2015 | - | 332 | 29 | 317 | - | 9.8 | 0.9 | 7.9 |
| 2021 | - | 310 | 7 | 271 | - | 11.2 | 0.0 | 5.9 |
| 2025 | - | 290 | 1 | 269 | - | 8.0 | 0.0 | 4.9 |

**Table 08A-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 7.2 | 0.1 | 29.9 | 21.2 | 16.1 | 31.8 |
| 2000 | 23.2 | - | 28.8 | 24.8 | 12.1 | 41.9 |
| 2005 | 20.6 | 0.1 | 17.4 | 22.2 | 13.1 | 38.3 |
| 2010 | 13.4 | 0.0 | 23.5 | 31.0 | 9.5 | 41.8 |
| 2015 | 14.5 | 0.1 | 21.8 | 25.7 | 10.0 | 44.8 |
| 2021 | 13.2 | 1.4 | 23.7 | 31.9 | 11.9 | 39.3 |
| 2025 | 17.3 | 0.0 | 30.9 | 16.2 | 15.0 | 41.7 |

**Table 08A-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | - | 4 | 15 | 6 | - |
| 2000 | - | - | - | 12 | 9 | - |
| 2005 | - | - | 4 | 33 | 6 | 1 |
| 2010 | - | - | 5 | 15 | 5 | - |
| 2015 | - | - | 11 | 20 | 3 | - |
| 2021 | - | - | 12 | 20 | 1 | 3 |
| 2025 | - | - | 8 | 26 | 7 | 1 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 1.5 (3.6) | - | 3.4 (8.3) | 30.8 (76.1) | 16.0 (39.5) | - |
| 2005 | - | - | 2.7 (6.6) | 29.5 (72.8) | 10.6 (26.3) | - |
| 2010 | - | - | 22.8 (56.3) | 34.2 (84.4) | 6.3 (15.5) | - |
| 2015 | - | - | 19.4 (48.0) | 12.1 (29.8) | 2.9 (7.2) | - |
| 2021 | - | 17.4 (43.0)* | 34.2 (84.4) | 23.4 (57.9) | 2.9 (7.2) | - |
| 2025 | 1.5 (3.6) | - | 0.7 (1.7) | 22.8 (56.3) | 2.4 (6.0) | - |

*Pellets per acre (ha)

**Table 08A-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Elymus trachycaulus (slender wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leucopoa kingii (spike fescue) | Poa fendleriana (muttongrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 74 | 177 | 4 | - | - | 10 | 7 | - | - | 242 |
| 2000 | 44 | 138 | 3 | - | - | 1 | 10 | 2 | - | 261 |
| 2005 | 54 | 158 | 4 | - | - | 1 | 12 | - | - | 217 |
| 2010 | 34 | 183 | 3 | - | - | - | 15 | 1 | 5 | 186 |
| 2015 | 16 | 173 | 18 | - | 3 | 4 | 35 | - | 4 | 257 |
| 2021 | 46 | 136 | 33 | 7 | - | 8 | 31 | - | - | 204 |
| 2025 | 30 | 162 | 2 | - | - | 6 | 3 | - | - | 206 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 1.7 | 2.7 | 0.2 | - | - | 0.0 | 0.1 | - | - | 4.3 |
| 2000 | 1.4 | 3.1 | 0.0 | - | - | 0.0 | 0.2 | 0.0 | - | 7.4 |
| 2005 | 1.6 | 3.0 | 0.0 | - | - | 0.0 | 0.1 | - | - | 3.9 |
| 2010 | 0.3 | 2.6 | 0.0 | - | - | - | 0.2 | 0.0 | 0.0 | 3.1 |
| 2015 | 0.3 | 2.8 | 0.1 | - | 0.1 | 0.0 | 0.6 | - | 0.0 | 5.8 |
| 2021 | 1.2 | 3.3 | 0.2 | 0.0 | - | 0.1 | 0.3 | - | - | 6.1 |
| 2025 | 1.0 | 3.5 | 0.0 | - | - | 0.1 | 0.0 | - | - | 3.4 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08A-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Antennaria microphylla (littleleaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Astragalus (milkvetch) | Astragalus gilviflorus (plains milkvetch) | Camelina microcarpa[ai] (littlepod false flax) | Castilleja flava (yellow Indian paintbrush) | Chaetopappa ericoides (rose heath) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium undulatum[a] (wavyleaf thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Cryptantha (cryptantha) | Erigeron (fleabane) | Erigeron eatonii (Eaton's fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erysimum capitatum[a] (sanddune wallflower) | Heterotheca villosa (hairy false goldenaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 2 | 64 | - | - | - | - | 28 | 25 | - | 17 | 100 | - | - | - | - | - |
| 2000 | 3 | - | 2 | 59 | - | - | - | - | 28 | - | 26 | 102 | 2 | 12 | - | - | 2 |
| 2005 | 5 | - | - | 75 | - | - | 10 | - | 5 | - | 31 | 80 | - | - | - | - | - |
| 2010 | - | 4 | - | 65 | - | 3 | 10 | 3 | 6 | - | 37 | 67 | - | - | 4 | - | - |
| 2015 | 14 | 15 | - | 74 | 7 | 4 | 7 | - | 12 | 1 | 43 | 78 | - | - | 3 | 11 | 1 |
| 2021 | 9 | - | - | 61 | - | - | - | 1 | 6 | - | 17 | 99 | - | 16 | 8 | - | - |
| 2025 | - | 2 | - | 88 | - | - | - | - | 1 | - | 40 | 52 | - | 17 | 3 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | 1.5 | - | - | - | - | 0.1 | 0.4 | - | 0.1 | 0.8 | - | - | - | - | - |
| 2000 | 0.0 | - | 0.2 | 1.6 | - | - | - | - | 0.5 | - | 0.5 | 0.9 | 0.0 | 0.0 | - | - | 0.0 |
| 2005 | 0.0 | - | - | 2.9 | - | - | 0.1 | - | 0.3 | - | 0.4 | 0.8 | - | - | - | - | - |
| 2010 | - | 0.0 | - | 1.3 | - | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.5 | 0.6 | - | - | 0.0 | - | - |
| 2015 | 0.4 | 0.1 | - | 2.0 | 0.0 | 0.0 | 0.0 | - | 0.7 | 0.0 | 0.6 | 0.8 | - | - | 0.0 | 0.1 | 0.0 |
| 2021 | 0.2 | - | - | 1.1 | - | - | - | 0.0 | 0.0 | - | 0.1 | 0.9 | - | 0.1 | 0.1 | - | - |
| 2025 | - | 0.0 | - | 1.3 | - | - | - | - | 0.0 | - | 0.4 | 0.4 | - | 0.0 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lepidium[a] (pepperweed) | Lesquerella parvula (pygmy bladderpod) | Linum lewisii (Lewis flax) | Lithospermum incisum (narrowleaf stoneseed) | Machaeranthera grindelioides (rayless tansyaster) | Microsteris gracilis[a] (slender phlox) | Oenothera (evening primrose) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 53 | 11 | 12 | 51 | - | - | 95 | - | 48 | - | - | - | - | - | - | 13 |
| 2000 | - | 49 | 18 | 14 | 25 | - | 1 | 77 | - | 73 | - | - | - | - | - | - | 3 |
| 2005 | - | 20 | 6 | 8 | 43 | - | - | 101 | - | 61 | 2 | 47 | 14 | 1 | - | 1 | 13 |
| 2010 | - | 25 | 20 | 10 | 29 | 7 | - | 76 | 30 | 50 | 3 | 64 | 6 | 1 | 1 | - | 20 |
| 2015 | 3 | 39 | 18 | 19 | 57 | - | - | 135 | - | 79 | 3 | 96 | - | 5 | 9 | 4 | 9 |
| 2021 | - | 47 | 13 | 13 | 49 | - | - | 82 | - | 71 | 16 | 23 | - | - | - | - | - |
| 2025 | - | 9 | 5 | 14 | 45 | - | - | 38 | 2 | 84 | 1 | 5 | - | - | - | - | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | 0.0 | 0.1 | 0.3 | - | - | 0.7 | - | 0.5 | - | - | - | - | - | - | 0.0 |
| 2000 | - | 0.4 | 0.2 | 0.2 | 0.3 | - | 0.0 | 0.7 | - | 1.5 | - | - | - | - | - | - | 0.0 |
| 2005 | - | 0.1 | 0.1 | 0.0 | 1.2 | - | - | 1.0 | - | 0.7 | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.2 |
| 2010 | - | 0.2 | 0.1 | 0.1 | 0.4 | 0.1 | - | 0.5 | 0.6 | 0.4 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | - | 0.1 |
| 2015 | 0.1 | 0.2 | 0.2 | 0.2 | 1.0 | - | - | 1.1 | - | 0.6 | 0.0 | 0.4 | - | 0.0 | 0.1 | 0.1 | 0.1 |
| 2021 | - | 0.2 | 0.1 | 0.1 | 0.8 | - | - | 0.7 | - | 1.2 | 0.2 | 0.1 | - | - | - | - | - |
| 2025 | - | 0.0 | 0.0 | 0.2 | 0.5 | - | - | 0.1 | 0.0 | 1.6 | 0.0 | 0.0 | - | - | - | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Townsendia incana (hoary Townsend daisy) | Zigadenus elegans (mountain deathcamas) |
|---|---|---|
| year | Nested | |
| 1995 | - | 13 |
| 2000 | 4 | 0 |
| 2005 | 11 | 3 |
| 2010 | 2 | - |
| 2015 | - | 13 |
| 2021 | - | 11 |
| 2025 | - | 8 |
| year | Average Cover (%) | |
| 1995 | - | 0.0 |
| 2000 | 0.1 | 0.0 |
| 2005 | 0.1 | 0.0 |
| 2010 | 0.0 | - |
| 2015 | - | 0.1 |
| 2021 | - | 0.1 |
| 2025 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08A-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Pinus flexilis[t] (limber pine) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 2.2 | 0.3 | 0.7 | 24.9 | 0.3 | 4.1 | 0.5 | - |
| 2010 | 2.4 | 1.1 | 0.2 | 29.1 | 0.4 | 3.3 | 3.1 | 0 |
| 2015 | 2.6 | 0.3 | 0.5 | 28.5 | 0.6 | 5 | - | 0.1 |
| 2021 | 3.3 | 0.2 | - | 28.4 | 0.4 | 5.9 | 0.2 | 0.1 |
| 2025 | 3.4 | 0 | - | 30.2 | 0.4 | 1.9 | - | 0.2 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | - | 0.2 | 0.0 | 18.9 | 0.4 | 0.5 | - | 0.0 |
| 2000 | 1.1 | 0.4 | 1.1 | 17.2 | 0.3 | 3.0 | - | 0.1 |
| 2005 | 0.7 | 0.3 | 0.4 | 21.8 | 0.2 | 2.7 | 0.0 | 0.0 |
| 2010 | 2.0 | 0.3 | 0.2 | 17.9 | 0.4 | 2.1 | 2.2 | 0.0 |
| 2015 | 2.4 | 0.2 | 0.2 | 20.9 | 0.2 | 4.2 | - | 0.0 |
| 2021 | 2.5 | 0.3 | 0.1 | 21.7 | 0.3 | 6.2 | 0.0 | 0.1 |
| 2025 | 3.8 | 0.0 | 0.1 | 24.4 | 0.4 | 2.7 | 0.0 | 0.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08A-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 140 | - | 29 | 71 | 0 | 57 | 0 | 14 | 51/84 |
| 2000 | 200 | - | 10 | 90 | 0 | 70 | 30 | 0 | 45/70 |
| 2005 | 380 | - | 47 | 53 | 0 | 21 | 32 | 0 | 48/81 |
| 2010 | 460 | - | 39 | 61 | 0 | 39 | 4 | 4 | 56/85 |
| 2015 | 420 | 20 | 48 | 52 | 0 | 57 | 38 | 0 | 62/91 |
| 2021 | 260 | - | 8 | 92 | 0 | 15 | 85 | 0 | - / - |
| 2025 | 380 | - | 26 | 74 | 0 | 16 | 63 | 0 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 500 | 60 | 4 | 96 | 0 | 0 | 0 | 0 | 10/18 |
| 2000 | 700 | 80 | 14 | 86 | 0 | 0 | 0 | 0 | 8/15 |
| 2005 | 600 | - | 3 | 97 | 0 | 17 | 0 | 0 | 17/18 |
| 2010 | 720 | - | 14 | 86 | 0 | 11 | 8 | 0 | 8/20 |
| 2015 | 480 | 100 | 33 | 67 | 0 | 0 | 0 | 13 | 8/15 |
| 2021 | 360 | - | 22 | 72 | 6 | 0 | 0 | 6 | - / - |
| 2025 | 100 | - | 40 | 60 | 0 | 0 | 20 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 520 | - | 0 | 100 | 0 | 0 | 42 | 0 | 14/34 |
| 2000 | 460 | - | 4 | 74 | 22 | 13 | 0 | 4 | 13/34 |
| 2005 | 280 | - | 0 | 86 | 14 | 0 | 0 | 0 | 16/46 |
| 2010 | 320 | - | 6 | 63 | 31 | 44 | 19 | 6 | 17/40 |
| 2015 | 320 | - | 6 | 63 | 31 | 56 | 31 | 56 | 15/34 |
| 2021 | 120 | - | 0 | 67 | 33 | 0 | 0 | 50 | - / - |
| 2025 | 100 | - | 0 | 60 | 40 | 20 | 80 | 40 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 6200 | 240 | 29 | 70 | 1 | 68 | 22 | 30 | 53/92 |
| 2000 | 6720 | 80 | 29 | 67 | 4 | 17 | 63 | 2 | 46/72 |
| 2005 | 6980 | 120 | 32 | 62 | 6 | 6 | 87 | 2 | 49/83 |
| 2010 | 7240 | 100 | 36 | 64 | 1 | 24 | 29 | 7 | 47/74 |
| 2015 | 6780 | 140 | 28 | 72 | 0 | 27 | 67 | 63 | 54/80 |
| 2021 | 7120 | 60 | 35 | 62 | 3 | 14 | 74 | 3 | - / - |
| 2025 | 8000 | - | 11 | 89 | 0 | 18 | 73 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/20 |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 24/33 |
| 2005 | - | - | - | - | - | - | - | - | 24/33 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | 33/42 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 300 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/29 |
| 2000 | 440 | - | 5 | 91 | 5 | 0 | 0 | 0 | 12/18 |
| 2005 | 320 | - | 0 | 100 | 0 | 6 | 0 | 0 | 11/25 |
| 2010 | 800 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/21 |
| 2015 | 660 | - | 3 | 97 | 0 | 70 | 27 | 0 | 12/22 |
| 2021 | 600 | - | 13 | 87 | 0 | 0 | 7 | 0 | - / - |
| 2025 | 480 | - | 0 | 100 | 0 | 63 | 0 | 0 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1940 | 20 | 9 | 91 | 0 | 0 | 0 | 0 | 14/14 |
| 2000 | 5520 | 80 | 3 | 95 | 2 | 0 | 3 | 0 | 13/22 |
| 2005 | 6300 | 80 | 4 | 95 | 1 | 0 | 0 | 1 | 15/23 |
| 2010 | 6260 | - | 1 | 99 | 0 | 0 | 0 | 0 | 16/20 |
| 2015 | 12140 | 880 | 18 | 82 | 0 | 19 | 0 | 0 | 12/21 |
| 2021 | 13240 | 160 | 16 | 83 | 1 | 1 | 0 | 1 | - / - |
| 2025 | 6260 | - | 10 | 87 | 3 | 0 | 0 | 2 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 16/21 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus flexilis[t] -- (limber pine) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 23/31 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 200 | - | 10 | 90 | 0 | 30 | 0 | 0 | 17/31 |
| 2000 | 160 | - | 0 | 100 | 0 | 25 | 13 | 0 | 15/23 |
| 2005 | 200 | - | 10 | 80 | 10 | 60 | 0 | 10 | 21/31 |
| 2010 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | 19/31 |
| 2015 | 140 | - | 14 | 86 | 0 | 29 | 29 | 0 | 18/30 |
| 2021 | 180 | - | 11 | 89 | 0 | 11 | 22 | 0 | - / - |
| 2025 | 200 | - | 10 | 80 | 10 | 50 | 10 | 10 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

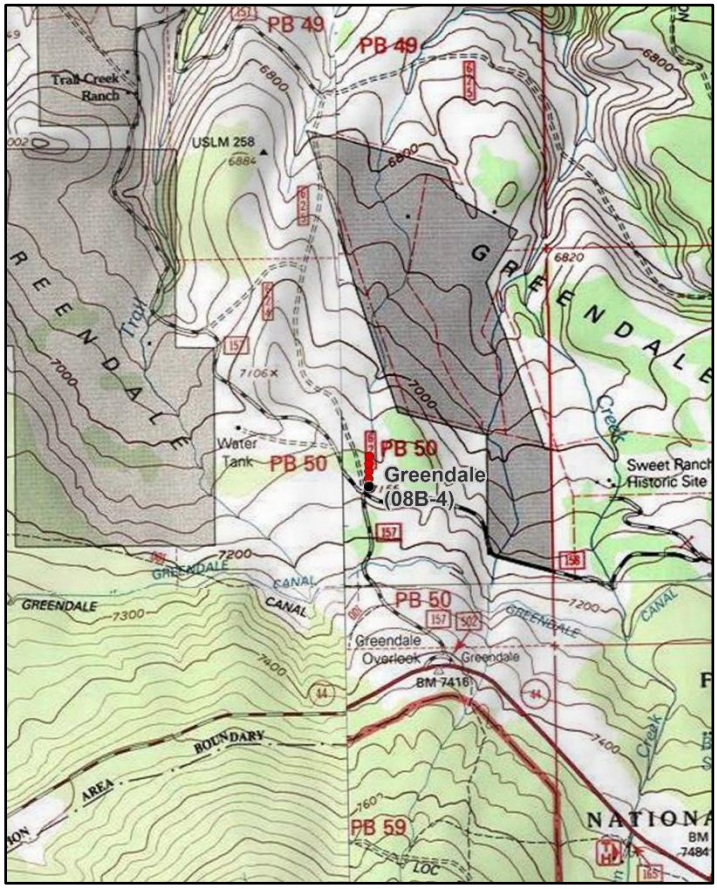
**Table 08A-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

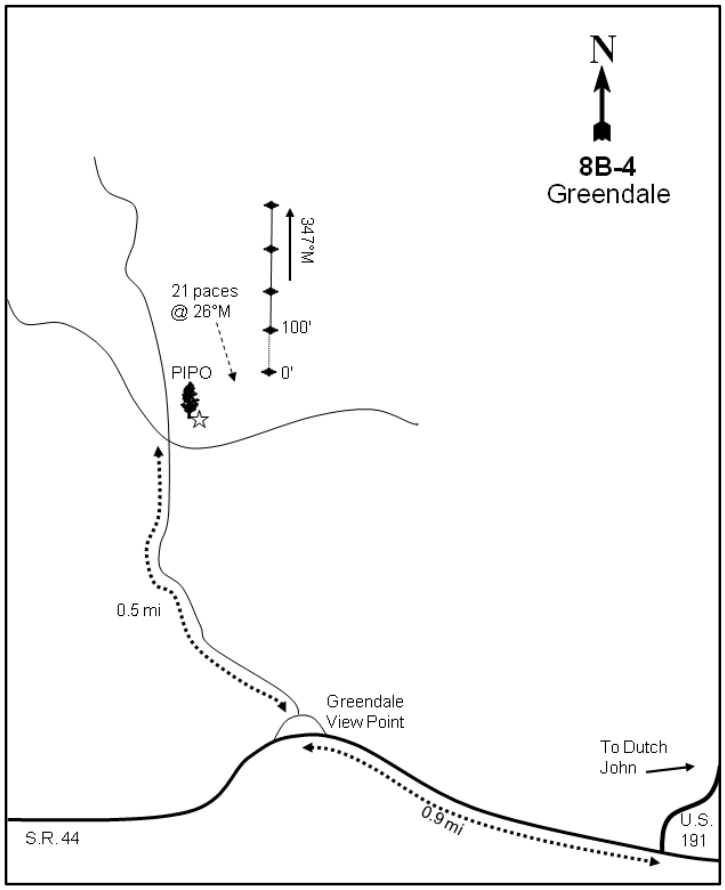
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus flexilis (limber pine) | | | | | | | |
| 2000 | 21 | - | - | - | - | - | 3.0 |
| 2015 | 34 | 13 | 87 | - | - | - | 6.3 |
| 2021 | 11 | - | 100 | - | - | - | 7.2 |
| 2025 | 31 | 10 | 80 | 10 | - | - | 3.0 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2000 | 4 | - | - | - | - | - | 1.5 |
| 2021 | 4 | - | 100 | - | - | - | 4.5 |
| 2025 | 6 | - | 100 | - | - | - | 3.0 |

**Table 13A-01.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 29.2 | 14.8 | 14.0 | 18.1 | 0.0 | 8.5 | 0.0 | 84.6 | Good |
| 2000 | 29.6 | 13.6 | 12.8 | 24.4 | 0.0 | 10.0 | 0.0 | 90.4 | Good-Excellent |
| 2005 | 30.0 | 13.6 | 15.0 | 17.3 | 0.0 | 10.0 | 0.0 | 85.9 | Good |
| 2010 | 30.0 | 14.8 | 15.0 | 12.3 | 0.0 | 10.0 | 0.0 | 82.1 | Good |
| 2015 | 30.0 | 14.9 | 14.4 | 19.6 | 0.0 | 10.0 | 0.0 | 88.9 | Good-Excellent |
| 2021 | 30.0 | 14.3 | 15.0 | 22.4 | 0.0 | 10.0 | 0.0 | 91.7 | Good-Excellent |
| 2025 | 30.0 | 14.9 | 6.1 | 16.0 | 0.0 | 9.8 | 0.0 | 76.8 | Good |

# GREENDALE - STUDY NO. 08B-4




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Dutch John SW; Township 2N, Range 21E, Section 50 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 626438 East 4526365 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 581 |
| Transect Bearing | 347° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the junction of Highways U-44 and U.S. 191, proceed toward Manila for 0.9 miles and turn off at the Greendale view point. Take the dirt road (Forest Service Road #157) to the north which goes to the Canyon Rim trail, then go 0.5 miles to an intersection. From the ponderosa pine (*Pinus ponderosa*) northeast of the intersection, walk 21 paces at 26 degrees magnetic to the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | LEWIS/ALLEN |
| Elevation | 7,100ft (2,164m) |
| Aspect | North |
| Slope | 7% |
| Sample Dates | 08/16/1995, 07/25/2000, 07/13/2005, 08/02/2010, 06/22/2015, 07/13/2020, 07/16/2025 |

## Wildlife Habitat and Vegetation History

**Table 08B-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Shiras Moose | crucial | year-long |

**Table 08B-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | NA |
| 1988 | Mountain Big Sagebrush | NA |
| 1995 | Mountain Big Sagebrush | NA |
| 2000 | Mountain Big Sagebrush | NA |
| 2005 | Mountain Big Sagebrush | NA |
| 2010 | Mountain Big Sagebrush | NA |
| 2015 | Mountain Big Sagebrush/Perennial Grass | NA |
| 2020 | Mountain Big Sagebrush/Perennial Grass | NA |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

Due to the close proximity of the highway, the area receives a large amount of recreational use by campers and hunters. The area is classified as deer and elk winter range, but depending on the weather, it actually receives year-round use by big game.

## Soils

**Table 08B-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.3 | 61.4 | 21.7 | 16.9 | 2.5 | 3.3 | 227.2 | 0.6 | 07/25/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) has been the dominant shrub species on this site since study establishment in 1982 (Pre-1992 Data), although density has steadily decreased. Other browse species such as Fendler's ceanothus (*Ceanothus fendleri*) and antelope bitterbrush (*Purshia tridentata*) have also been present and have contributed lesser, but still significant amounts of cover (Photos, Table 08B-04.12, Table 08B-04.13). The herbaceous understory has remained abundant and very diverse over the course of the study. Perennial grasses, particularly Kentucky bluegrass (*Poa pratensis*) and needle and thread (*Hesperostipa comata*), have provided a majority of the herbaceous cover and have been a co-dominant vegetation component since 2015. The introduced and noxious annual forb species gypsyflower (*Cynoglossum officinale*) was observed in 2015 and 2020 in low amounts, but it was not recorded in cover or frequency data in 2025 (Table 08B-04.7, Table 08B-04.10, Table 08B-04.11). Ponderosa pine (*Pinus ponderosa*) is infilling on the transect and surrounding areas. Infill of ponderosa will likely continue without a major tree-removing disturbance; this site could potentially transition to a ponderosa pine-dominated state in the future. Twoneedle pinyon (*Pinus edulis*) was observed in point-quarter density measurements for the first time in 2025 in low amounts (Table 08B-04.12, 08B-04.14).

Condition of this site as mule deer winter range has remained good since 1995. Factors that negatively influence this site's condition include limited recruitment of young plants into the preferred browse community, and the presence of annual grass and noxious weeds (Table 08B-04.7, Table 08B-04.13, Table 08B-04.15). Pellet transect data indicates that deer presence was moderate to high in most sample years, but it was low in 2015. During the 2024/25 winter season the area had concentrated occurrences of collared mule deer (Wildlife Migration Initiative). Seventy percent or more of bitterbrush plants sampled in density strips were moderately to heavily utilized most years sampled, but only 52% and 66% showed signs of utilization in 2000 and 2010, respectively. Elk presence was high in 2000 and moderate in 2005, but it has remained low since 2010. Cattle presence has been low to moderate in many sample years (Table 08B-04.9, Table 08B-04.13). On-site observations for 2025 noted little to no utilization of the herbaceous community.

## Trend Summary Tables

**Table 08B-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 18.8 | 8.0 | - | - | - | - |
| 2000 | 19.9 | 4.5 | 1.2 | - | - | - |
| 2005 | 23.5 | 4.1 | 2.1 | 29.1 | 5.7 | 2.8 |
| 2010 | 20.1 | 3.5 | 2.4 | 33.4 | 6.5 | 4.5 |
| 2015 | 20.5 | 3.6 | 1.0 | 29.4 | 3.1 | 4.7 |
| 2020 | 23.6 | 9.1 | 2.6 | 31.0 | 9.8 | 5.1 |
| 2025 | 18.9 | 6.2 | 1.5 | 31.2 | 9.0 | 6.4 |

**Table 08B-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 6 | 427 | 362 | 268 | 0.2 | 13.3 | 4.8 | 8.6 |
| 2000 | - | 454 | 26 | 239 | - | 25.0 | 0.1 | 10.0 |
| 2005 | 3 | 385 | 124 | 239 | 0.0 | 16.4 | 0.6 | 13.3 |
| 2010 | 36 | 388 | 62 | 214 | 0.5 | 25.2 | 0.3 | 9.0 |
| 2015 | 49 | 441 | 210 | 263 | 1.3 | 27.2 | 1.4 | 15.2 |
| 2020 | 10 | 436 | 240 | 244 | 0.0 | 30.0 | 2.0 | 15.8 |
| 2025 | 5 | 424 | 154 | 275 | 0.4 | 26.4 | 0.6 | 15.5 |

**Table 08B-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 16.9 | 0.6 | 55.1 | 1.4 | 2.6 | 46.3 |
| 2000 | 11.8 | 0.7 | 65.0 | 1.3 | 1.8 | 58.9 |
| 2005 | 21.3 | 0.1 | 36.6 | 1.6 | 1.8 | 53.2 |
| 2010 | 12.9 | 0.2 | 60.5 | 2.3 | 1.2 | 57.6 |
| 2015 | 8.8 | 0.2 | 38.0 | 0.3 | 1.7 | 67.2 |
| 2020 | 9.6 | 1.3 | 56.7 | 0.6 | 1.4 | 61.6 |
| 2025 | 5.7 | 0.8 | 48.0 | 0.4 | 1.2 | 64.5 |

**Table 08B-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | 1 | 8 | 2 | - | - | - |
| 2000 | 3 | 35 | 6 | - | - | 11 |
| 2005 | 2 | 56 | 8 | - | - | 20 |
| 2010 | 1 | 42 | - | - | - | 9 |
| 2015 | - | 3 | 1 | - | - | 8 |
| 2020 | 1 | 32 | 1 | - | - | 8 |
| 2025 | 2 | 30 | 1 | - | - | 5 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 10.2 (25.1) | 30.8 (76.1) | 57.0 (140.7) | - | 0.5 (1.2) | - |
| 2005 | 3.6 (9.0) | 95.8 (236.7) | 24.8 (61.2) | - | - | - |
| 2010 | 5.1 (12.6) | 42.2 (104.3) | 12.8 (31.5) | 0.6 (1.4) | - | - |
| 2015 | - | 6.0 (14.9) | - | - | - | - |
| 2020 | 10.2 (25.1) | 30.2 (74.5) | 5.3 (13.2) | - | - | - |
| 2025 | 6.5 (16.1) | 46.9 (115.9) | 7.4 (18.2) | - | - | - |

**Table 08B-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Dactylis glomerata[i] (orchardgrass) | Danthonia unispicata (onespike danthonia) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Elymus trachycaulus (slender wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 6 | 18 | 27 | - | 41 | 129 | - | 90 | 19 | - | 29 | 344 | 36 | 4 | - |
| 2000 | - | - | - | 19 | 4 | 1 | 4 | 20 | 4 | 93 | 3 | - | 12 | 435 | 12 | 3 | - |
| 2005 | 13 | - | 3 | 24 | 12 | - | 41 | 24 | - | 169 | 29 | - | 73 | 239 | 24 | - | - |
| 2010 | - | - | 36 | 13 | 10 | - | 28 | 29 | - | 104 | 26 | - | 40 | 311 | 9 | 0 | - |
| 2015 | 23 | - | 49 | 45 | 10 | - | 60 | 53 | - | 85 | 45 | 1 | 3 | 350 | 123 | - | - |
| 2020 | 48 | - | 10 | 34 | 10 | 5 | 58 | 71 | - | 166 | 40 | 13 | 59 | 237 | 102 | - | 20 |
| 2025 | - | 2 | 5 | 5 | 12 | - | 26 | 67 | - | 89 | 29 | 6 | 19 | 320 | 34 | 1 | 5 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.2 | 0.2 | 0.1 | - | 0.3 | 0.9 | - | 1.0 | 0.1 | - | 0.3 | 10.2 | 0.3 | 0.0 | - |
| 2000 | - | - | - | 0.2 | 0.2 | 0.0 | 0.0 | 0.1 | 0.0 | 3.2 | 0.0 | - | 0.1 | 21.1 | 0.0 | 0.0 | - |
| 2005 | 0.1 | - | 0.0 | 0.7 | 0.2 | - | 0.5 | 0.1 | - | 6.4 | 1.1 | - | 0.7 | 6.6 | 0.2 | - | - |
| 2010 | - | - | 0.5 | 0.4 | 0.2 | - | 0.7 | 0.2 | - | 4.3 | 0.7 | - | 0.3 | 18.4 | 0.0 | 0.0 | - |
| 2015 | 0.5 | - | 1.3 | 1.4 | 0.2 | - | 0.9 | 0.5 | - | 2.3 | 1.3 | 0.0 | 0.0 | 17.6 | 2.4 | - | - |
| 2020 | 1.7 | - | 0.0 | 0.8 | 0.5 | 0.2 | 0.6 | 0.9 | - | 7.0 | 1.6 | 0.8 | 2.1 | 11.4 | 2.1 | - | 0.4 |
| 2025 | - | 0.0 | 0.4 | 0.2 | 0.9 | - | 0.6 | 0.7 | - | 2.7 | 0.6 | 0.1 | 0.2 | 19.9 | 0.3 | 0.0 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08B-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Antennaria (pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Artemisia ludoviciana (white sagebrush) | Astragalus (milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 1 | 28 | 48 | - | 42 | - | 5 | - | - | 59 | 7 | 1 | - | 301 | 216 | 80 | - |
| 2000 | 13 | - | - | - | 39 | - | 2 | 5 | 2 | 61 | - | - | - | 3 | 3 | 72 | - |
| 2005 | 10 | 42 | 16 | - | 41 | - | 13 | - | - | 63 | 3 | - | - | 71 | 18 | 72 | 2 |
| 2010 | 10 | - | 2 | - | 51 | - | 5 | 3 | - | 36 | - | - | - | 23 | 31 | 91 | - |
| 2015 | 6 | 15 | 1 | 1 | 59 | - | 20 | 2 | - | 82 | 6 | - | - | 106 | 65 | 60 | 14 |
| 2020 | 13 | 53 | 3 | 4 | 47 | - | 11 | 6 | - | 73 | 3 | - | 2 | 227 | 36 | 28 | 14 |
| 2025 | 11 | 85 | 2 | 17 | 25 | 34 | 11 | 9 | - | 71 | - | - | 4 | 128 | 45 | 110 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.1 | 0.2 | - | 1.1 | - | 0.0 | - | - | 3.7 | 0.0 | 0.0 | - | 3.0 | 1.6 | 0.4 | - |
| 2000 | 0.1 | - | - | - | 0.9 | - | 0.0 | 0.2 | 0.0 | 3.9 | - | - | - | 0.0 | 0.0 | 0.7 | - |
| 2005 | 0.2 | 0.2 | 0.0 | - | 1.4 | - | 0.0 | - | - | 5.4 | 0.0 | - | - | 0.2 | 0.1 | 0.7 | 0.0 |
| 2010 | 0.1 | - | 0.0 | - | 1.1 | - | 0.0 | 0.0 | - | 3.5 | - | - | - | 0.1 | 0.1 | 0.6 | - |
| 2015 | 0.0 | 0.1 | 0.0 | 0.0 | 1.5 | - | 0.1 | 0.0 | - | 7.4 | 0.0 | - | - | 0.4 | 0.4 | 0.2 | 0.6 |
| 2020 | 0.3 | 0.2 | 0.0 | 0.0 | 1.0 | - | 0.1 | 0.1 | - | 8.7 | 0.0 | - | 0.0 | 1.6 | 0.1 | 0.4 | 0.2 |
| 2025 | 0.1 | 0.7 | 0.0 | 0.0 | 0.8 | 0.9 | 0.1 | 0.2 | - | 6.3 | - | - | 0.0 | 0.3 | 0.2 | 2.5 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Cynoglossum officinale[ani] (gypsyflower) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Fritillaria atropurpurea (spotted fritillary) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Geum triflorum (old man's whiskers) | Heterotheca villosa (hairy false goldenaster) | Ipomopsis aggregata (scarlet gilia) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 13 | - | - | 12 | 3 | 6 | 7 | - | 2 | - | 41 | 0 | 6 | 38 | 2 | - |
| 2000 | - | 20 | - | - | 32 | 38 | 4 | 4 | - | - | - | 18 | 8 | - | 37 | 12 | - |
| 2005 | - | 21 | - | - | 8 | 39 | 6 | 6 | - | 1 | - | 4 | 2 | 17 | 40 | 9 | - |
| 2010 | - | 4 | - | - | 8 | 40 | - | 6 | - | 1 | - | 23 | 14 | 9 | 31 | 7 | - |
| 2015 | 2 | 7 | 4 | - | 16 | 74 | 7 | 19 | - | - | 3 | 54 | 3 | 26 | 32 | - | - |
| 2020 | - | 12 | 4 | - | 16 | 40 | 3 | 7 | 3 | - | 1 | 27 | - | - | 9 | 4 | - |
| 2025 | - | 4 | - | 1 | 4 | 33 | - | 6 | - | - | - | 32 | - | - | 12 | 5 | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 | - | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 | - |
| 2000 | - | 0.1 | - | - | 0.5 | 0.9 | 0.0 | 0.2 | - | - | - | 0.5 | 0.0 | - | 0.2 | 0.1 | - |
| 2005 | - | 0.1 | - | - | 0.0 | 1.2 | 0.3 | 0.2 | - | 0.0 | - | 0.5 | 0.0 | 0.1 | 0.2 | 0.4 | - |
| 2010 | - | 0.0 | - | - | 0.2 | 0.8 | - | 0.1 | - | 0.0 | - | 0.5 | 0.1 | 0.0 | 0.1 | 0.2 | - |
| 2015 | 0.0 | 0.0 | 0.0 | - | 0.2 | 1.9 | 0.0 | 0.2 | - | - | 0.1 | 0.8 | 0.0 | 0.2 | 0.3 | - | - |
| 2020 | - | 0.1 | 0.0 | - | 0.5 | 0.6 | 0.0 | 0.3 | 0.0 | - | 0.0 | 1.7 | - | - | 0.0 | 0.2 | - |
| 2025 | - | 0.0 | - | 0.0 | 0.2 | 0.4 | - | 0.2 | - | - | - | 1.2 | - | - | 0.1 | 0.3 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Mertensia (bluebells) | Microsteris gracilis[a] (slender phlox) | Myosotis stricta[ai] (strict forget-me-not) | Oenothera pallida[a] (pale evening primrose) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox (phlox) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla (cinquefoil) | Sedum lanceolatum (spearleaf stonecrop) | Silene antirrhina[a] (sleepy silene) | Silene drummondii (Drummond's campion) | Solidago velutina (threenerve goldenrod) | Symphyotrichum ascendens (western aster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 6 | - | 19 | 27 | 23 | 9 | 8 | 57 | - | 14 | - | - | 29 | 26 |
| 2000 | - | - | - | - | - | 10 | 24 | - | 3 | 7 | 15 | - | - | 1 | - | 10 | 17 |
| 2005 | - | 15 | - | 5 | 1 | - | 18 | - | - | - | 38 | - | 7 | 2 | 5 | - | 27 |
| 2010 | - | 1 | - | - | 4 | 1 | 22 | - | - | - | 30 | - | 4 | - | - | 13 | 20 |
| 2015 | 11 | 33 | 24 | 2 | - | 6 | 11 | - | - | - | 2 | 6 | 12 | - | 9 | 1 | 21 |
| 2020 | 6 | 4 | - | - | 2 | 13 | 10 | - | 2 | 1 | 47 | - | 2 | - | 8 | - | 43 |
| 2025 | - | - | 6 | 2 | - | 10 | 21 | - | 2 | 1 | 8 | - | 5 | 2 | 2 | - | 11 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 0.0 | - | 0.1 | 0.9 | 0.0 | 0.5 | 0.0 | 0.2 | - | 0.0 | - | - | 0.5 | 0.3 |
| 2000 | - | - | - | - | - | 0.0 | 1.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.3 | 0.3 |
| 2005 | - | 0.0 | - | 0.0 | 0.0 | - | 1.2 | - | - | - | 0.1 | - | 0.0 | 0.0 | 0.0 | - | 0.9 |
| 2010 | - | 0.0 | - | - | 0.0 | 0.1 | 0.6 | - | - | - | 0.2 | - | 0.0 | - | - | 0.5 | 0.3 |
| 2015 | 0.0 | 0.2 | 0.1 | 0.0 | - | 0.0 | 0.7 | - | - | - | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.0 | 0.5 |
| 2020 | 0.1 | 0.0 | - | - | 0.0 | 0.1 | 0.2 | - | 0.0 | 0.0 | 0.1 | - | 0.0 | - | 0.1 | - | 0.7 |
| 2025 | - | - | 0.0 | 0.0 | - | 0.2 | 1.2 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) | Viola (violet) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 11 | 8 | 11 | - | 3 |
| 2000 | 6 | 5 | 7 | - | - |
| 2005 | - | 6 | 22 | - | 6 |
| 2010 | - | 1 | 17 | - | - |
| 2015 | 7 | 20 | 21 | 4 | 3 |
| 2020 | - | 24 | 25 | - | 10 |
| 2025 | - | 9 | 22 | - | 3 |
| year | Average Cover (%) | | | | |
| 1995 | 0.1 | 0.0 | 0.0 | - | 0.0 |
| 2000 | 0.0 | 0.0 | 0.0 | - | - |
| 2005 | - | 0.0 | 0.1 | - | 0.1 |
| 2010 | - | 0.0 | 0.1 | - | - |
| 2015 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 2020 | - | 0.2 | 0.3 | - | 0.1 |
| 2025 | - | 0.1 | 0.1 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08B-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Ceanothus fendleri (Fendler's ceanothus) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Pinus ponderosa[t] (ponderosa pine) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.7 | 19.7 | 4.5 | 0.9 | - | 0 | 0.3 | 2.8 | 7.6 | 1.1 |
| 2010 | 0.8 | 21 | 5.5 | 0.3 | - | 0.2 | 0.5 | 4.5 | 10.5 | 1.1 |
| 2015 | 0.9 | 18.4 | 1.7 | 0.9 | 0.3 | 0.1 | 0.1 | 4.7 | 8.8 | 1.3 |
| 2020 | 0.8 | 16.4 | 8.4 | 0.5 | 0.4 | 0.2 | 0.3 | 5.1 | 11.6 | 2.2 |
| 2025 | 0.3 | 15.8 | 8.3 | 0.3 | 0.2 | 0.1 | 0.1 | 6.4 | 13.1 | 2 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | - | 14.1 | 6.8 | 0.7 | - | 0.0 | 0.5 | - | 4.0 | 0.8 |
| 2000 | 0.4 | 13.3 | 3.9 | 0.3 | - | 0.1 | 0.2 | 1.2 | 6.0 | 0.2 |
| 2005 | 0.8 | 16.6 | 3.0 | 0.7 | - | 0.1 | 0.2 | 2.1 | 5.8 | 0.2 |
| 2010 | 0.6 | 13.1 | 2.5 | 0.4 | - | 0.1 | 0.4 | 2.4 | 6.0 | 0.5 |
| 2015 | 0.8 | 14.7 | 2.7 | 0.3 | 0.0 | 0.2 | 0.4 | 1.0 | 4.7 | 0.3 |
| 2020 | 0.4 | 12.1 | 7.5 | 0.1 | 0.6 | 0.3 | 0.6 | 2.6 | 9.8 | 1.3 |
| 2025 | 0.1 | 10.2 | 5.2 | 0.1 | 0.1 | 0.1 | 0.6 | 1.5 | 7.5 | 1.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08B-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 77/119 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 65/89 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 80/99 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 75/93 |
| 2015 | 40 | - | 0 | 100 | 0 | 50 | 50 | 0 | 91/110 |
| 2020 | 80 | - | 0 | 75 | 25 | 50 | 0 | 25 | 65/85 |
| 2025 | 80 | - | 25 | 75 | 0 | 75 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 4440 | 20 | 12 | 82 | 6 | 60 | 12 | 1 | 47/77 |
| 2000 | 4800 | - | 11 | 60 | 29 | 35 | 2 | 6 | 50/68 |
| 2005 | 4520 | 1080 | 15 | 59 | 26 | 34 | 21 | 9 | 58/87 |
| 2010 | 3440 | 160 | 7 | 66 | 27 | 47 | 23 | 29 | 61/87 |
| 2015 | 3340 | 20 | 5 | 74 | 22 | 44 | 20 | 26 | 51/79 |
| 2020 | 2860 | 20 | 3 | 77 | 20 | 41 | 13 | 32 | 51/75 |
| 2025 | 2680 | 200 | 4 | 58 | 38 | 37 | 38 | 37 | - / - |
| Ceanothus fendleri -- (Fendler's ceanothus) | | | | | | | | | |
| 1995 | 780 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/132 |
| 2000 | 900 | - | 9 | 91 | 0 | 0 | 0 | 0 | 21/100 |
| 2005 | 4680 | - | 8 | 92 | 0 | 31 | 14 | 0 | 15/33 |
| 2010 | 3120 | - | 7 | 93 | 0 | 14 | 0 | 0 | 18/45 |
| 2015 | 4580 | - | 12 | 87 | 0 | 38 | 3 | 1 | 17/30 |
| 2020 | 5000 | - | 45 | 55 | 0 | 11 | 0 | 0 | 18/58 |
| 2025 | 4380 | - | 0 | 100 | 0 | 7 | 56 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 840 | - | 5 | 95 | 0 | 2 | 0 | 0 | 33/40 |
| 2000 | 620 | - | 3 | 94 | 3 | 0 | 0 | 0 | 26/33 |
| 2005 | 620 | - | 16 | 81 | 3 | 0 | 0 | 0 | 30/37 |
| 2010 | 580 | - | 0 | 100 | 0 | 7 | 0 | 7 | 35/40 |
| 2015 | 880 | - | 11 | 86 | 2 | 5 | 36 | 0 | 30/34 |
| 2020 | 320 | - | 0 | 94 | 6 | 25 | 0 | 6 | 30/36 |
| 2025 | 340 | - | 0 | 94 | 6 | 0 | 0 | 6 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/44 |
| 2020 | 380 | - | 0 | 95 | 5 | 5 | 0 | 5 | 32/35 |
| 2025 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/19 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/26 |
| 2010 | 320 | - | 31 | 69 | 0 | 0 | 0 | 0 | 22/30 |
| 2015 | 480 | - | 13 | 88 | 0 | 0 | 0 | 0 | 16/19 |
| 2020 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/17 |
| 2025 | 100 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 4880 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/10 |
| 2000 | 1740 | - | 82 | 18 | 0 | 0 | 0 | 0 | 5/6 |
| 2005 | 2900 | - | 12 | 88 | 0 | 0 | 0 | 0 | 7/11 |
| 2010 | 4160 | - | 24 | 76 | 0 | 0 | 0 | 0 | 7/11 |
| 2015 | 2020 | - | 21 | 79 | 0 | 40 | 0 | 0 | 9/13 |
| 2020 | 2880 | - | 40 | 60 | 1 | 0 | 0 | 1 | 7/9 |
| 2025 | 2300 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus ponderosa[t] -- (ponderosa pine) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 80 | - | 50 | 50 | 0 | 0 | 0 | 25 | - / - |
| 2020 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 1240 | 40 | 8 | 92 | 0 | 81 | 8 | 0 | 37/83 |
| 2000 | 1380 | 20 | 9 | 81 | 10 | 51 | 1 | 3 | 47/96 |
| 2005 | 1580 | 40 | 11 | 63 | 25 | 15 | 81 | 10 | 38/86 |
| 2010 | 1860 | 40 | 29 | 62 | 9 | 57 | 9 | 8 | 48/99 |
| 2015 | 1580 | - | 4 | 80 | 17 | 49 | 44 | 15 | 44/87 |
| 2020 | 1740 | 20 | 18 | 78 | 3 | 46 | 25 | 3 | 46/92 |
| 2025 | 1840 | 20 | 2 | 95 | 3 | 26 | 63 | 3 | - / - |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 1995 | 180 | 20 | 89 | 11 | 0 | 0 | 0 | 0 | 17/21 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 32/33 |
| 2010 | - | - | - | - | - | - | - | - | 49/45 |
| 2015 | - | - | - | - | - | - | - | - | 29/24 |
| 2020 | - | - | - | - | - | - | - | - | 41/19 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 44/135 |
| 2000 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 51/168 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 50/126 |
| 2010 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 61/119 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 48/121 |
| 2020 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 55/117 |
| 2025 | 420 | - | 0 | 100 | 0 | 71 | 29 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

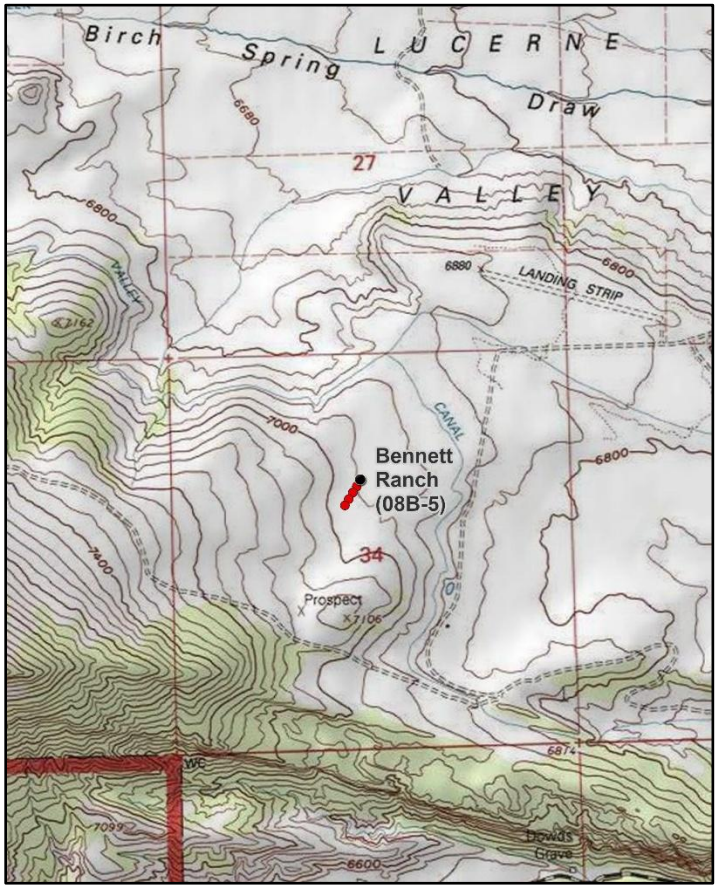
**Table 08B-04.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

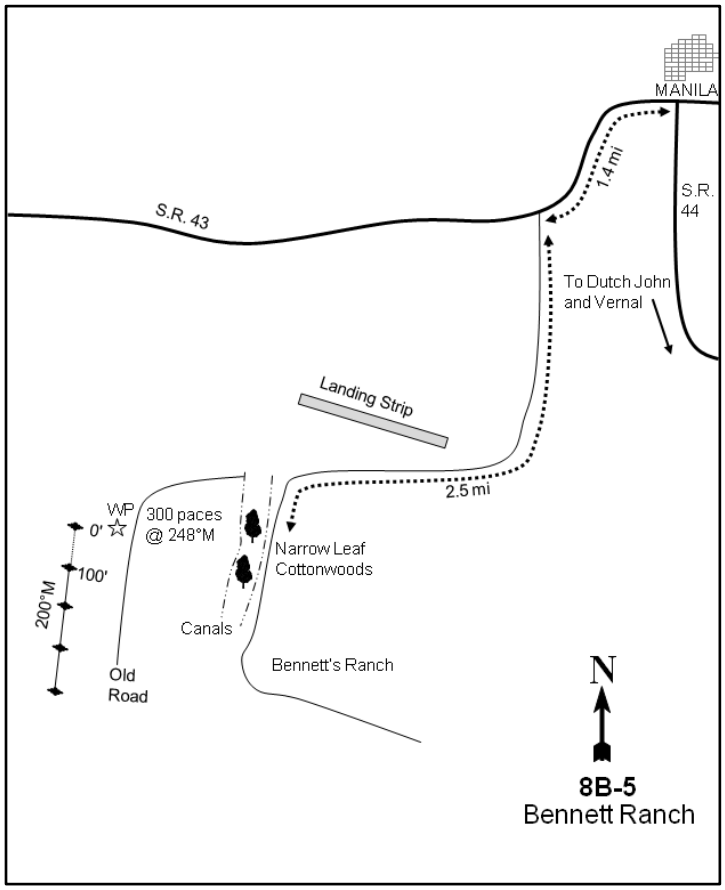
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2025 | 2 | - | 50 | - | - | 50 | 10.5 |
| Pinus ponderosa (ponderosa pine) | | | | | | | |
| 2000 | 26 | - | - | - | - | - | 8.8 |
| 2005 | 27 | - | 33 | 25 | - | 42 | 14.9 |
| 2010 | 34 | 7 | 7 | 14 | 29 | 43 | 14.3 |
| 2015 | 38 | - | - | 46 | 31 | 23 | 22.8 |
| 2020 | 35 | 7 | - | 14 | 21 | 57 | 20.6 |
| 2025 | 32 | - | 8 | 15 | - | 77 | 21.0 |

**Table 08B-04.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 24.3 | 13.7 | 5.2 | 26.5 | -0.1 | 10.0 | 0.0 | **79.6** | Good |
| 2000 | 26.4 | 8.3 | 5.2 | 30.0 | 0.0 | 10.0 | 0.0 | **79.9** | Good |
| 2005 | 30.0 | 7.8 | 6.6 | 30.0 | 0.0 | 10.0 | 0.0 | **84.4** | Good |
| 2010 | 30.0 | 9.1 | 7.1 | 30.0 | -0.4 | 10.0 | 0.0 | **85.8** | Good |
| 2015 | 30.0 | 9.5 | 2.1 | 30.0 | -1.0 | 10.0 | -2.0 | **78.6** | Good |
| 2020 | 30.0 | 11.2 | 4.8 | 30.0 | 0.0 | 10.0 | -2.0 | **84.0** | Good |
| 2025 | 30.0 | 8.8 | 1.5 | 30.0 | -0.3 | 10.0 | 0.0 | **80.0** | Good |

# BENNETT RANCH - STUDY NO. 08B-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Jessen Butte NE; Township 3N, Range 19E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 603463 East 4534401 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 200° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of State Route (SR) 43 and Main Street in Manila, proceed west on SR-43 for 1.4 miles to a dirt road (Bennion Lane) on the left. Turn south and go 2.5 miles to a narrowleaf cottonwood (*Populus angustifolia*) tree on the right (west) side of the road. From the cottonwood tree, the 0-foot baseline stake is 300 paces away at a bearing of 234 degrees magnetic. Several canals have to be crossed to reach the study transect from the road.

## Site Information

| | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | No data |
| Elevation | 6,900ft (2,103m) |
| Aspect | Northeast |
| Slope | 8% |
| Sample Dates | 09/06/1995, 08/02/2000, 08/04/2005, 08/05/2010, 06/23/2015, 07/20/2020, 07/15/2025 |

## Wildlife Habitat and Vegetation History

**Table 08B-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Greater Sage-Grouse | | |

**Table 08B-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush/Black Sagebrush | Early Phase I |

## Site Notes

Water is seasonally available from an irrigation ditch about 400 yards from the site. The area is used by cattle and wintering deer and elk.

## Soils

**Table 08B-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.1 | 61.4 | 16.0 | 22.6 | 2.1 | 6.0 | 92.8 | 0.9 | 08/02/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Upland Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC310UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase Undefined |

Since study establishment in 1982, this site has remained dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and black sagebrush (*A. nova*); other shrub species have also been present to a lesser extent (Pre-1992 Data, Table 08B-05.12, Table 08B-05.13). The herbaceous understory has remained diverse and abundant, with perennial grasses contributing a majority of the cover in all sample years (Table 08B-05.10, Table 08B-05.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have slowly increased in the area over the study period (Photos, Table 08B-05.12, Table 08B-05.14); there may be potential for further encroachment and increased dominance of pinyon and juniper in the future without a tree-removing disturbance. However, the site has remained within Early Phase I of woodland succession since study establishment (Table 08B-05.4), indicating that this may not be an immediate concern.

Condition of this site as mule deer winter range has fluctuated between fair and good-excellent since 1995; winter range condition was considered to be good in 2025. However, factors that negatively influence this site's condition include increased decadence within the preferred browse community and limited recruitment of young plants into the browse population (Table 08B-05.13, Table 08B-05.15). Pellet transect data indicates that elk presence was moderate in 2005 and 2010, but that it has remained low in all other sample years since 2000. Cattle presence has generally remained low over time. Deer presence has fluctuated between low and high since 2000, and presence was high in 2020 and 2025 (Table 08B-05.9). Utilization and decadence of mountain big sagebrush have exhibited overall increases. Over half of mountain big sagebrush plants sampled in density strips have been moderately to heavily browsed in all sample years since 1995, with 95% showing that level of utilization in 2025. This high utilization combined with other factors (climatic, etc.) has likely contributed to the overall increase in decadence within the mountain big sagebrush population (Table 08B-05.13). On-site observations for 2025 noted little to no utilization of the herbaceous community and that preferred browse species had good primary growth.

## Trend Summary Tables

**Table 08B-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 22.4 | 2.0 | 0.9 | - | - | - |
| 2000 | 20.6 | 2.9 | 0.0 | - | - | - |
| 2005 | 22.4 | 4.4 | - | 27.1 | 2.1 | - |
| 2010 | 20.1 | 1.6 | - | 28.8 | 0.9 | - |
| 2015 | 23.9 | 2.4 | - | 36.0 | 1.5 | - |
| 2020 | 25.2 | 3.3 | 0.0 | 29.6 | 1.7 | 0.5 |
| 2025 | 22.8 | 1.4 | 0.0 | 29.5 | 1.4 | 0.3 |

**Table 08B-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 365 | 72 | 226 | - | 8.3 | 0.3 | 4.6 |
| 2000 | - | 387 | 2 | 228 | - | 8.6 | 0.0 | 5.2 |
| 2005 | - | 345 | 3 | 201 | - | 5.9 | 0.0 | 4.1 |
| 2010 | - | 321 | 4 | 180 | - | 9.2 | 0.0 | 3.8 |
| 2015 | - | 369 | 36 | 221 | - | 17.8 | 0.3 | 6.2 |
| 2020 | - | 360 | 4 | 249 | - | 11.8 | 0.0 | 6.2 |
| 2025 | - | 368 | 2 | 221 | - | 9.9 | 0.0 | 5.9 |

**Table 08B-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 21.1 | 3.2 | 39.3 | 6.0 | 9.5 | 31.8 |
| 2000 | 29.2 | 6.0 | 36.2 | 8.5 | 5.7 | 41.4 |
| 2005 | 35.7 | 3.9 | 29.6 | 7.4 | 6.7 | 32.0 |
| 2010 | 35.3 | 3.4 | 33.3 | 6.1 | 5.7 | 36.2 |
| 2015 | 40.1 | 4.6 | 33.0 | 8.8 | 6.9 | 39.6 |
| 2020 | 22.0 | 6.6 | 33.1 | 12.2 | 6.1 | 37.8 |
| 2025 | 29.8 | 6.2 | 29.7 | 4.6 | 6.3 | 41.4 |

**Table 08B-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 10 | 32 | 10 | 3 |
| 2000 | 3 | 7 | 9 | 2 |
| 2005 | 3 | 19 | 21 | 12 |
| 2010 | 1 | 21 | 12 | 2 |
| 2015 | 3 | 14 | 6 | 8 |
| 2020 | 3 | 20 | 2 | 7 |
| 2025 | 5 | 32 | 10 | 5 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 5.8 (14.3) | 9.4 (23.2) | 14.1 (34.8) | - |
| 2005 | 10.9 (26.9) | 22.1 (54.6) | 31.5 (77.8) | - |
| 2010 | 1.5 (3.6) | 38.9 (96.0) | 33.5 (82.8) | - |
| 2015 | 7.2 (17.9) | 15.4 (38.1) | 14.7 (36.4) | - |
| 2020 | 2.9 (7.2) | 46.2 (114.2) | 4.0 (9.9) | - |
| 2025 | 1.5 (3.6) | 52.3 (129.1) | 10.7 (26.5) | - |

**Table 08B-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 36 | - | 91 | 255 | 113 | 19 | - | 51 | 78 | - |
| 2000 | 15 | - | 18 | 293 | 101 | 7 | 4 | 91 | 64 | 4 |
| 2005 | 31 | - | 21 | 232 | 150 | 46 | - | 50 | 98 | 5 |
| 2010 | 20 | - | 16 | 172 | 115 | 49 | 19 | 70 | 73 | - |
| 2015 | 44 | 15 | 48 | 218 | 200 | 55 | - | 3 | 140 | - |
| 2020 | 14 | 12 | 16 | 264 | 94 | 51 | - | 21 | 221 | - |
| 2025 | 11 | - | 9 | 211 | 172 | 66 | 8 | 9 | 195 | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.4 | - | 1.4 | 2.8 | 2.0 | 0.1 | - | 0.9 | 0.7 | - |
| 2000 | 0.2 | - | 0.4 | 4.0 | 1.9 | 0.1 | 0.0 | 1.5 | 0.5 | 0.0 |
| 2005 | 0.3 | - | 0.1 | 1.4 | 1.9 | 0.6 | - | 0.5 | 1.1 | 0.1 |
| 2010 | 0.4 | - | 0.2 | 1.8 | 2.7 | 1.2 | 0.2 | 1.6 | 1.3 | - |
| 2015 | 1.5 | 0.4 | 1.5 | 4.0 | 5.3 | 1.7 | - | 0.2 | 3.3 | - |
| 2020 | 0.1 | 0.1 | 0.5 | 3.1 | 2.1 | 0.8 | - | 0.4 | 4.6 | - |
| 2025 | 0.4 | - | 0.1 | 1.2 | 3.3 | 2.0 | 0.2 | 0.2 | 2.4 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08B-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Arabis (rockcress) | Astragalus (milkvetch) | Astragalus purshii (woollypod milkvetch) | Calochortus nuttallii (sego lily) | Castilleja (Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chaetopappa ericoides (rose heath) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Erigeron pumilus (shaggy fleabane) | Hackelia patens (spotted stickseed) | Hymenoxys richardsonii (pingue rubberweed) | Lesquerella alpina (alpine bladderpod) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 16 | - | - | 6 | - | 1 | 5 | 50 | - | 12 | - | 33 | 4 | - | 1 | 4 |
| 2000 | 13 | - | 1 | - | - | 4 | 19 | 35 | - | 3 | 1 | - | 2 | 3 | - | 7 | 2 |
| 2005 | - | 9 | - | - | 8 | - | 5 | 15 | - | - | 11 | 13 | 3 | 4 | 4 | 9 | - |
| 2010 | 2 | 1 | 5 | - | - | - | 2 | 13 | 3 | - | 6 | 4 | 1 | 8 | - | 7 | 1 |
| 2015 | - | 3 | - | 10 | 11 | - | 4 | 18 | - | - | 29 | 14 | 36 | - | - | 5 | - |
| 2020 | - | 11 | - | 9 | 6 | 1 | 28 | 6 | 3 | - | 19 | 14 | 1 | 5 | - | 8 | 6 |
| 2025 | - | - | - | - | 12 | - | 9 | 14 | - | - | 22 | 23 | 2 | - | - | 7 | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | 0.1 | - | 0.0 | - | 0.2 | 0.0 | - | 0.0 | 0.0 |
| 2000 | 0.0 | - | 0.0 | - | - | 0.0 | 0.1 | 0.4 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.1 | 0.0 |
| 2005 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.1 | - | - | 0.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.2 | - |
| 2010 | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.2 | - | 0.2 | 0.0 |
| 2015 | - | 0.0 | - | 0.1 | 0.0 | - | 0.2 | 0.4 | - | - | 0.4 | 0.1 | 0.3 | - | - | 0.2 | - |
| 2020 | - | 0.1 | - | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | - | 0.1 | 0.2 | 0.0 | 0.0 | - | 0.2 | 0.0 |
| 2025 | - | - | - | - | 0.0 | - | 0.0 | 0.3 | - | - | 0.3 | 0.3 | 0.0 | - | - | 0.2 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Orobanche fasciculata (clustered broomrape) | Packera multilobata (lobeleaf groundsel) | Penstemon humilis (low beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Stenotus acaulis (stemless mock goldenweed) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | 65 | - | 3 | - | - | - | 102 | - | - | - | 130 | - | - |
| 2000 | 26 | - | 8 | - | 4 | 1 | 130 | - | 1 | - | 105 | 4 | - |
| 2005 | 47 | - | 4 | - | 0 | - | 98 | - | - | - | 89 | 7 | - |
| 2010 | 23 | - | 2 | - | 0 | - | 79 | 5 | - | - | 105 | 1 | - |
| 2015 | 44 | - | 5 | 3 | - | - | 111 | - | - | 4 | 101 | 5 | - |
| 2020 | 32 | - | 7 | - | 3 | - | 125 | 3 | - | - | 118 | 5 | 1 |
| 2025 | 36 | 1 | 5 | - | - | - | 119 | - | - | 1 | 99 | 5 | - |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | 0.2 | - | 0.2 | - | - | - | 2.6 | - | - | - | 1.4 | - | - |
| 2000 | 0.1 | - | 0.1 | - | 0.0 | 0.0 | 3.0 | - | 0.0 | - | 1.2 | 0.0 | - |
| 2005 | 0.3 | - | 0.1 | - | 0.0 | - | 1.8 | - | - | - | 0.9 | 0.2 | - |
| 2010 | 0.2 | - | 0.0 | - | 0.0 | - | 1.8 | 0.0 | - | - | 1.1 | 0.0 | - |
| 2015 | 0.4 | - | 0.0 | 0.0 | - | - | 2.9 | - | - | 0.0 | 1.0 | 0.4 | - |
| 2020 | 0.1 | - | 0.1 | - | 0.0 | - | 4.0 | 0.0 | - | - | 0.5 | 0.4 | 0.0 |
| 2025 | 0.5 | 0.0 | 0.1 | - | - | - | 2.9 | - | - | 0.0 | 0.6 | 0.6 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08B-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Linanthus pungens (granite prickly phlox) | Opuntia (pricklypear) | Opuntia polyacantha (plains pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 10.7 | 16.4 | - | 0.3 | - | - | 1.3 | - | - | - | 0.5 | - | - | - |
| 2010 | 8.9 | 19.7 | - | 0.4 | 0.1 | 0.1 | 0.1 | - | - | - | 0.4 | - | - | - |
| 2015 | 10.8 | 25.1 | - | 0.3 | - | 0.1 | 0.3 | - | - | - | 0.9 | - | - | - |
| 2020 | 8.4 | 20.9 | - | 0.5 | - | 0.2 | 1.1 | 0.5 | 0.1 | - | 0.1 | - | - | - |
| 2025 | 11 | 18.5 | 0.2 | - | - | - | 0.7 | 0.3 | - | 0 | 0 | 0.5 | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | | |
| 1995 | 5.6 | 16.0 | - | 0.3 | 0.1 | 0.0 | 0.0 | 0.9 | 0.6 | - | 1.6 | - | - | - |
| 2000 | 4.6 | 16.0 | - | 0.4 | - | 0.0 | 1.3 | - | 0.0 | - | 1.1 | - | - | 0.0 |
| 2005 | 6.9 | 15.5 | - | 0.6 | - | - | 2.7 | - | 0.0 | - | 1.1 | - | - | - |
| 2010 | 7.8 | 12.3 | - | 0.2 | 0.0 | 0.0 | 0.2 | - | - | - | 1.2 | - | - | - |
| 2015 | 9.1 | 14.8 | - | 0.2 | - | 0.0 | 0.4 | - | 0.0 | - | 1.7 | - | 0.0 | - |
| 2020 | 8.4 | 16.8 | - | 0.3 | - | 0.0 | 1.8 | 0.0 | 0.0 | - | 1.1 | - | 0.0 | 0.0 |
| 2025 | 9.3 | 13.5 | 0.3 | - | - | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.3 | 0.4 | - | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08B-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 5/14 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 2760 | - | 19 | 80 | 1 | 27 | 4 | 1 | 18/50 |
| 2000 | 4060 | 40 | 6 | 86 | 8 | 11 | 4 | 3 | 16/38 |
| 2005 | 4520 | - | 5 | 89 | 7 | 0 | 0 | 5 | 19/61 |
| 2010 | 4500 | 20 | 10 | 83 | 7 | 4 | 7 | 7 | 17/49 |
| 2015 | 5560 | - | 3 | 89 | 8 | 17 | 31 | 9 | 16/46 |
| 2020 | 5040 | - | 2 | 71 | 27 | 8 | 16 | 26 | 16/44 |
| 2025 | 5160 | 20 | 4 | 76 | 20 | 20 | 78 | 21 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 6080 | 40 | 10 | 83 | 7 | 56 | 25 | 5 | 34/69 |
| 2000 | 5260 | - | 2 | 59 | 39 | 44 | 27 | 25 | 32/62 |
| 2005 | 4960 | 40 | 3 | 56 | 40 | 37 | 49 | 33 | 39/71 |
| 2010 | 4300 | 40 | 3 | 68 | 29 | 41 | 13 | 41 | 38/79 |
| 2015 | 5460 | - | 3 | 69 | 29 | 13 | 66 | 34 | 36/71 |
| 2020 | 4840 | 20 | 2 | 71 | 27 | 19 | 44 | 35 | 38/75 |
| 2025 | 4700 | 20 | 6 | 52 | 42 | 23 | 72 | 55 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 300 | - | 0 | 93 | 7 | 13 | 27 | 7 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 240 | - | 0 | 100 | 0 | 17 | 0 | 0 | 25/38 |
| 2000 | 500 | - | 8 | 80 | 12 | 4 | 0 | 8 | 23/40 |
| 2005 | 340 | - | 12 | 77 | 12 | 71 | 0 | 12 | 25/41 |
| 2010 | 220 | - | 0 | 91 | 9 | 27 | 0 | 36 | 24/37 |
| 2015 | 320 | - | 0 | 94 | 6 | 6 | 0 | 13 | 24/39 |
| 2020 | 300 | - | 7 | 87 | 7 | 7 | 13 | 13 | 21/36 |
| 2025 | 80 | - | 50 | 25 | 25 | 0 | 25 | 25 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/20 |
| 2000 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 11/17 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/9 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/14 |
| 2020 | 180 | - | 11 | 89 | 0 | 56 | 0 | 0 | 12/15 |
| 2025 | 100 | - | 0 | 100 | 0 | 80 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 42/33 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 48/49 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/56 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 51/52 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 680 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/36 |
| 2000 | 3300 | 20 | 2 | 96 | 1 | 0 | 0 | 1 | 12/16 |
| 2005 | 4460 | 60 | 1 | 97 | 2 | 0 | 0 | 1 | 17/20 |
| 2010 | 400 | - | 10 | 90 | 0 | 0 | 0 | 0 | 20/20 |
| 2015 | 940 | - | 2 | 98 | 0 | 0 | 0 | 0 | 19/19 |
| 2020 | 2800 | - | 5 | 94 | 1 | 0 | 0 | 1 | 17/16 |
| 2025 | 1680 | - | 13 | 86 | 1 | 0 | 0 | 1 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | 220 | - | 9 | 91 | 0 | 64 | 9 | 0 | 12/22 |
| 2000 | 160 | - | 50 | 50 | 0 | 50 | 0 | 0 | 10/17 |
| 2005 | 120 | - | 0 | 83 | 17 | 0 | 100 | 17 | 6/15 |
| 2010 | 80 | - | 50 | 50 | 0 | 100 | 0 | 0 | 12/17 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/20 |
| 2020 | - | - | - | - | - | - | - | - | 7/20 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 700 | - | 0 | 91 | 9 | 0 | 0 | 9 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 860 | - | 2 | 98 | 0 | 9 | 0 | 0 | 9/39 |
| 2000 | 1320 | 20 | 6 | 92 | 2 | 0 | 0 | 0 | 9/27 |
| 2005 | 1320 | - | 5 | 80 | 15 | 2 | 0 | 5 | 10/25 |
| 2010 | 1020 | 20 | 4 | 82 | 14 | 0 | 0 | 20 | 9/30 |
| 2015 | 1580 | - | 1 | 95 | 4 | 0 | 0 | 5 | 10/26 |
| 2020 | 1140 | 20 | 2 | 90 | 9 | 0 | 0 | 9 | 9/26 |
| 2025 | 840 | 20 | 2 | 98 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/7 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/8 |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

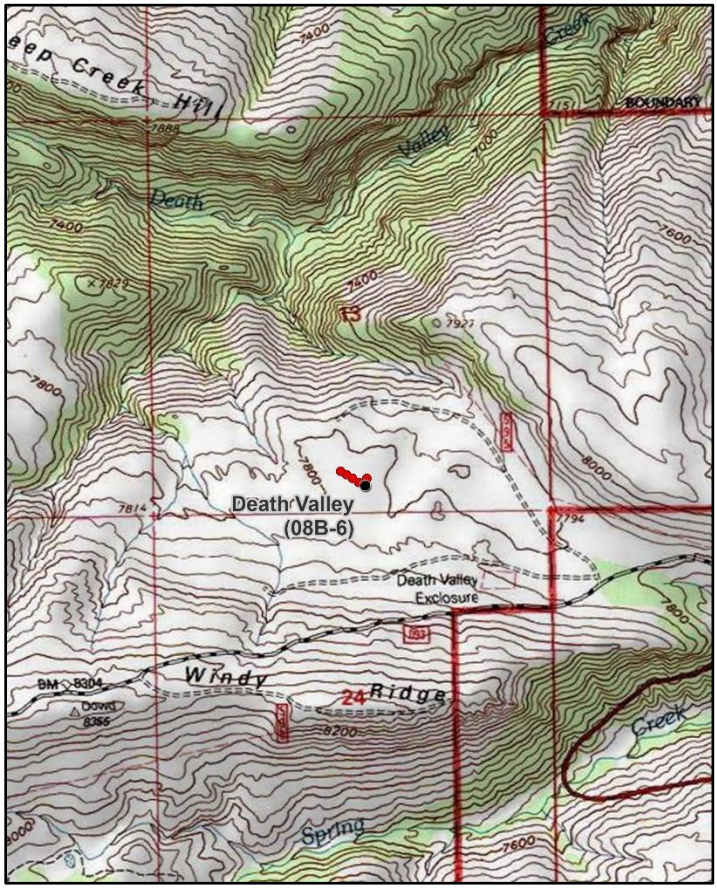
**Table 08B-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

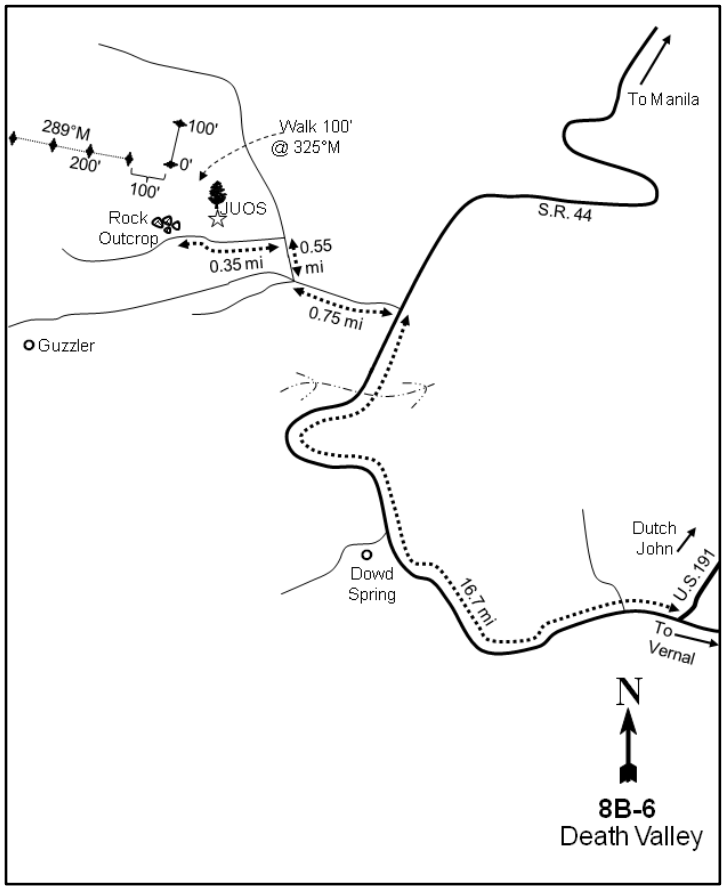
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 29 | - | - | - | - | - | 9.7 |
| 2010 | 34 | - | 23 | 77 | - | - | 8.6 |
| 2015 | 31 | - | 8 | 85 | 8 | - | 8.3 |
| 2020 | 32 | - | 8 | 92 | - | - | 11.2 |
| 2025 | 44 | 7 | 7 | 64 | 21 | - | 7.1 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 8 | - | - | - | - | - | 4.4 |
| 2010 | 11 | - | 100 | - | - | - | 2.0 |
| 2015 | 1 | - | - | 100 | - | - | 5.0 |
| 2020 | 5 | - | 50 | 50 | - | - | 8.0 |
| 2025 | 15 | 43 | 43 | - | 14 | - | 2.6 |

**Table 08B-05.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 28.0 | 13.4 | 6.1 | 16.6 | 0.0 | 9.2 | 0.0 | **73.3** | Good |
| 2000 | 25.8 | 5.3 | 1.4 | 17.1 | 0.0 | 10.0 | 0.0 | **59.6** | Fair |
| 2005 | 30.0 | 6.9 | 1.9 | 11.8 | 0.0 | 8.2 | 0.0 | **58.8** | Fair |
| 2010 | 30.0 | 8.6 | 2.5 | 18.4 | 0.0 | 7.7 | 0.0 | **67.2** | Good |
| 2015 | 30.0 | 8.2 | 1.3 | 30.0 | 0.0 | 10.0 | 0.0 | **79.5** | Good-Excellent |
| 2020 | 30.0 | 7.0 | 1.1 | 23.6 | 0.0 | 10.0 | 0.0 | **71.7** | Good |
| 2025 | 30.0 | 4.9 | 2.5 | 19.7 | 0.0 | 10.0 | 0.0 | **67.1** | Good |

# DEATH VALLEY - STUDY NO. 08B-6




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Manila SW; Township 2N, Range 19E, Section 13 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 606882 East 4528709 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 15° magnetic (Lines 2-4: 289° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 1: No Rebar, Belt 2: 36ft |

**Directions to Site**

From the Dutch John turn off on State Route (SR) 44, proceed 16.7 miles north towards Manila. As you reach the summit before dropping down into Sheep Creek, there will be a dirt road (Forest Service Road #93) to the left. Turn left onto FS #93 and drive west for 0.8 miles until you pass a grove of ponderosa pine (*Pinus ponderosa*) trees. Turn to the right, where the road forks again almost immediately. Keep to the right and proceed 0.6 miles to another faint fork. Turn left and drive west for 0.4 miles to the top of a small knoll. To the north, two rock outcroppings mark the highest point of the knoll. From the Utah juniper (*Juniperus osteosperma*) on top, the 0-foot baseline stake is 100 feet away at a bearing of 325 degrees magnetic. There is a 100 foot break between the 0-foot stake and the start of line 2.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | SHEEP CREEK MTN |
| Elevation | 7,800ft (2,377m) |
| Aspect | West |
| Slope | 4% |
| Sample Dates | 08/31/1995, 07/26/2000, 07/18/2005, 08/05/2010, 07/08/2015, 07/15/2020, 07/09/2025 |

**Table 08B-06.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | West Northwest D1 Wildlife Habitat Project- Sheep Creek Geological Loop (Phases 4, 5, and 6) (Proposed) | 7582 | Fall 2026 | 2039 |

## Wildlife Habitat and Vegetation History

**Table 08B-06.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Pronghorn | crucial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 08B-06.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 1988 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 1995 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 2000 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 2005 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 2010 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 2015 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 2020 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |
| 2025 | Alderleaf Mountain Mahogany/Mountain Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 08B-06.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loamy Sand | 5.9 | 83.6 | 6.4 | 10.0 | 1.6 | 4.0 | 60.8 | 0.8 | 08/31/1995 |
| Loamy Fine Sand | 6.9 | 85.4 | 5.7 | 8.9 | 1.5 | 2.5 | 76.8 | 0.7 | 07/26/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Shallow Loam (Birchleaf Mountain Mahogany) |
| NRCS Ecological Site # | R047XA441UT |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1982, the plant community on this site has remained dominated by alderleaf mountain mahogany (*Cercocarpus montanus*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) (Photos, Pre-1992 Data). A number of other shrub species have also been present, but they have generally contributed less cover than mountain mahogany and sagebrush (Table 08B-06.12). The herbaceous understory has remained diverse and abundant over the sample years with perennial grasses providing most of the cover; perennial forbs also provided notable cover in 2025 (Table 08B-06.10, Table 08B-06.11). Twoneedle pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and Rocky Mountain juniper (*J. scopulorum*) have been observed on this site in low amounts (Photos, Table 08B-06.12, Table 08B-06.13, Table 08B-06.14); there may be potential for further encroachment over time without the occurrence of a tree-removing disturbance. However, the site has been considered to be within Early Phase I of woodland succession throughout the study period (Table 08B-06.4), indicating that further encroachment is likely not an immediate concern.

Condition of this site as mule deer winter range has been considered to be good since 1995. However, factors that negatively influence this site's condition include limited recruitment of young plants into the preferred browse community and the presence of annual grass (Table 08B-06.7, Table 08B-06.13, Table 08B-06.15). Pellet transect data indicates that deer presence has ranged between low and high over the sample years, and presence was moderate in 2025. However, elk presence has been high in most sample years but was low in 2025. Sixty percent or more of sagebrush plants and 80% or more of alderleaf mountain mahogany plants sampled in density strips were moderately to heavily utilized in most sample years, but only 14% of sagebrush and 59% of mahogany showed signs of utilization in 2025. Lower utilization rates in 2025 align with the lower presence of wildlife for the same year (Table 08B-06.9, Table 08B-06.13). On-site observations for 2025 noted little to no utilization of the herbaceous community and that the browse componentwas considered to have good primary growth.

## Trend Summary Tables

**Table 08B-06.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 24.2 | 3.2 | - | - | - | - |
| 2000 | 19.4 | 2.7 | - | - | - | - |
| 2005 | 22.0 | 3.6 | - | 24.0 | 3.8 | - |
| 2010 | 20.6 | 4.4 | - | 28.5 | 7.5 | 0.2 |
| 2015 | 18.0 | 4.9 | - | 27.4 | 7.8 | - |
| 2020 | 19.3 | 5.2 | - | 25.5 | 7.0 | 0.4 |
| 2025 | 26.3 | 6.3 | 0.1 | 30.9 | 6.6 | 0.5 |

**Table 08B-06.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 290 | 295 | 266 | - | 6.3 | 2.8 | 4.8 |
| 2000 | - | 419 | 130 | 266 | - | 19.1 | 1.2 | 6.1 |
| 2005 | 1 | 347 | 194 | 215 | 0.0 | 16.4 | 1.3 | 4.4 |
| 2010 | 4 | 357 | 156 | 257 | 0.0 | 14.2 | 1.0 | 5.9 |
| 2015 | 4 | 359 | 197 | 298 | 0.1 | 11.7 | 2.0 | 7.6 |
| 2020 | 24 | 352 | 304 | 268 | 0.2 | 12.0 | 2.9 | 7.2 |
| 2025 | 4 | 365 | 187 | 292 | 0.0 | 14.2 | 1.4 | 12.7 |

**Table 08B-06.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 17.6 | 3.0 | 60.1 | 0.5 | 2.3 | 35.1 |
| 2000 | 20.8 | 5.0 | 53.6 | 0.4 | 3.8 | 48.2 |
| 2005 | 22.5 | 2.6 | 48.8 | 0.1 | 3.6 | 43.3 |
| 2010 | 20.6 | 4.5 | 53.2 | 0.5 | 3.3 | 46.0 |
| 2015 | 21.1 | 2.9 | 45.3 | 0.2 | 3.2 | 44.8 |
| 2020 | 14.9 | 5.6 | 53.9 | 0.4 | 4.0 | 43.4 |
| 2025 | 14.9 | 6.6 | 43.6 | 0.3 | 4.8 | 49.3 |

**Table 08B-06.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Shiras Moose | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 37 | 17 | - | 12 |
| 2000 | - | 14 | 19 | 1 | 26 |
| 2005 | 2 | 18 | 21 | - | 72 |
| 2010 | 1 | 21 | 25 | - | 21 |
| 2015 | - | 29 | 19 | - | 30 |
| 2020 | 1 | 34 | 24 | 1 | 23 |
| 2025 | - | 30 | 7 | - | 17 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 5.1 (12.6) | 58.3 (144.0) | 47.6 (117.5) | 0.5 (1.2) | - |
| 2005 | 3.6 (9.0) | 13.4 (33.1) | 43.6 (107.6) | 0.5 (1.2) | - |
| 2010 | 1.5 (3.6) | 39.6 (97.7) | 40.2 (99.3) | - | - |
| 2015 | - | 22.8 (56.3) | 30.2 (74.5) | - | - |
| 2020 | 2.9 (7.2) | 63.7 (157.3) | 55.6 (137.4) | 3.9 (9.6) | - |
| 2025 | 2.2 (5.4) | 20.8 (51.3) | 6.0 (14.9) | - | - |

**Table 08B-06.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Carex obtusata (obtuse sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 6 | - | - | 36 | - | - | 122 | 128 | 62 | 28 | - | 136 |
| 2000 | - | 3 | - | 26 | - | 6 | 182 | 264 | 26 | 14 | - | 141 |
| 2005 | 4 | 3 | 1 | 17 | - | - | 136 | 260 | 69 | 17 | - | 126 |
| 2010 | 4 | 3 | 4 | 28 | - | - | 168 | 256 | 39 | 21 | 3 | 118 |
| 2015 | 6 | 3 | 4 | 24 | - | - | 181 | 269 | 83 | 33 | - | 75 |
| 2020 | 11 | 6 | 24 | 27 | - | 7 | 165 | 230 | 43 | 47 | 10 | 169 |
| 2025 | 4 | 2 | 4 | 23 | 9 | 15 | 172 | 198 | 56 | 12 | - | 195 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.2 | - | - | 0.5 | - | - | 0.8 | 2.9 | 0.5 | 0.1 | - | 1.4 |
| 2000 | - | 0.1 | - | 0.3 | - | 0.1 | 2.0 | 10.7 | 0.4 | 0.1 | - | 5.4 |
| 2005 | 0.1 | 0.1 | 0.0 | 0.1 | - | - | 0.9 | 12.5 | 1.4 | 0.4 | - | 0.8 |
| 2010 | 0.1 | 0.1 | 0.0 | 0.6 | - | - | 2.1 | 8.4 | 0.8 | 0.2 | 0.4 | 1.4 |
| 2015 | 0.0 | 0.1 | 0.1 | 0.4 | - | - | 1.2 | 7.2 | 2.0 | 0.4 | - | 0.4 |
| 2020 | 0.1 | 0.2 | 0.2 | 0.6 | - | 0.3 | 1.6 | 5.5 | 0.8 | 0.6 | 0.0 | 2.4 |
| 2025 | 0.0 | 0.4 | 0.0 | 0.4 | 0.0 | 0.4 | 1.3 | 7.7 | 1.5 | 0.2 | - | 2.3 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08B-06.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium cemuum (nodding onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Calochortus nuttallii (sego lily) | Camelina microcarpa[ai] (littlepod false flax) | Chenopodium fremontii[a] (Fremont's goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 84 | - | 1 | 3 | 6 | 14 | - | 9 | 165 | 83 | 32 | - | 14 | 4 | 14 | 95 |
| 2000 | 2 | 67 | - | - | 7 | 3 | - | - | - | 20 | - | 57 | - | 32 | - | - | 111 |
| 2005 | 1 | 58 | - | 6 | 5 | 14 | 7 | - | - | 118 | 16 | 28 | - | 33 | - | 23 | 65 |
| 2010 | 1 | 89 | - | 2 | 9 | 6 | 4 | - | 5 | 45 | 19 | 36 | 4 | 36 | - | 8 | 38 |
| 2015 | 9 | 80 | - | 25 | 3 | 12 | 18 | 7 | - | 32 | 19 | 44 | - | 47 | - | 140 | 5 |
| 2020 | 1 | 62 | - | - | 15 | 8 | 4 | 10 | - | 263 | 30 | 17 | 7 | 70 | - | - | 48 |
| 2025 | 12 | 65 | 13 | 2 | 16 | 40 | 5 | 1 | 2 | 131 | 13 | 62 | 5 | 20 | 3 | 7 | 60 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.4 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.9 | 0.4 | 0.2 | - | 0.3 | 0.0 | 0.0 | 0.6 |
| 2000 | 0.0 | 0.6 | - | - | 0.1 | 0.0 | - | - | - | 0.1 | - | 0.5 | - | 0.6 | - | - | 1.1 |
| 2005 | 0.0 | 0.7 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.4 | 0.1 | 0.2 | - | 0.3 | - | 0.1 | 0.3 |
| 2010 | 0.0 | 1.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.4 | 0.1 | 0.7 | - | 0.1 | 0.1 |
| 2015 | 0.0 | 0.5 | - | 0.2 | 0.0 | 0.1 | 0.1 | 0.0 | - | 0.1 | 0.0 | 0.5 | - | 0.9 | - | 1.2 | 0.0 |
| 2020 | 0.0 | 0.9 | - | - | 0.2 | 0.0 | 0.0 | 0.1 | - | 1.7 | 0.1 | 0.1 | 0.0 | 0.6 | - | - | 0.4 |
| 2025 | 0.2 | 0.9 | 0.0 | 0.0 | 0.7 | 0.1 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 1.6 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Draba oligosperma (fewseed draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron speciosus (aspen fleabane) | Eriogonum (buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erysimum (wallflower) | Fritillaria atropurpurea (spotted fritillary) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Hackelia patens (spotted stickseed) | Heterotheca villosa (hairy false goldenaster) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Lithospermum ruderale (western stoneseed) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 45 | 15 | - | - | 52 | - | - | - | - | 16 | - | - | 2 | 0 | 2 | 0 |
| 2000 | - | 5 | 59 | - | - | 62 | - | - | - | - | 29 | 11 | - | - | 2 | 1 | 6 |
| 2005 | - | 1 | 17 | - | 6 | 44 | - | - | - | - | 11 | 2 | - | 16 | 1 | 1 | 2 |
| 2010 | - | - | 8 | - | 21 | 61 | - | - | - | - | 12 | 2 | - | 60 | 1 | 6 | 11 |
| 2015 | - | 43 | - | 2 | 6 | 58 | 4 | - | - | 2 | 65 | 3 | 7 | 11 | 7 | 5 | 23 |
| 2020 | - | 19 | 12 | - | - | 52 | - | - | - | - | 39 | 3 | 8 | 8 | 2 | 5 | 11 |
| 2025 | 34 | 11 | 24 | - | - | 63 | - | 2 | 3 | - | 63 | 3 | 3 | 12 | 0 | 4 | 18 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.9 | 0.2 | - | - | 1.3 | - | - | - | - | 0.2 | - | - | 0.0 | 0.0 | 0.0 | 0.0 |
| 2000 | - | 0.1 | 1.1 | - | - | 1.3 | - | - | - | - | 0.8 | 0.1 | - | - | 0.0 | 0.0 | 0.0 |
| 2005 | - | 0.0 | 0.3 | - | 0.0 | 0.9 | - | - | - | - | 0.4 | 0.0 | - | 0.1 | 0.2 | 0.0 | 0.0 |
| 2010 | - | - | 0.3 | - | 0.4 | 1.0 | - | - | - | - | 0.5 | 0.0 | - | 0.5 | 0.2 | 0.0 | 0.1 |
| 2015 | - | 0.6 | - | 0.0 | 0.1 | 1.6 | 0.0 | - | - | 0.0 | 1.3 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 |
| 2020 | - | 0.7 | 0.2 | - | - | 1.6 | - | - | - | - | 1.4 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.1 |
| 2025 | 0.8 | 0.0 | 0.6 | - | - | 2.4 | - | 0.0 | 0.0 | - | 2.6 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera grindelioides (rayless tansyaster) | Mertensia lanceolata (prairie bluebells) | Microsteris gracilis[a] (slender phlox) | Orogenia linearifolia (Great Basin Indian potato) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Phacelia sericea[a] (silky phacelia) | Polygonum douglasii[a] (Douglas' knotweed) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | unknown perennial forb (unknown forb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 102 | - | 6 | - | 36 | 49 | 110 | - | - | - | 3 | 40 | - | - | 3 |
| 2000 | - | - | 5 | - | 3 | - | 1 | 9 | 87 | - | - | 10 | - | 23 | - | - | - |
| 2005 | - | - | 50 | - | 2 | - | - | 55 | 104 | 5 | - | 9 | - | 31 | - | - | - |
| 2010 | - | 9 | 4 | - | - | - | 3 | 22 | 92 | 1 | 2 | 2 | - | 26 | - | 4 | - |
| 2015 | 3 | 39 | 10 | - | 2 | 3 | 14 | 16 | 115 | 8 | - | - | - | 43 | 4 | 1 | 31 |
| 2020 | - | 30 | 121 | - | 1 | - | 1 | 41 | 96 | - | - | - | - | 36 | - | 7 | - |
| 2025 | - | 15 | 24 | 1 | - | - | 0 | 70 | 112 | - | - | - | 1 | 34 | - | 2 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.5 | - | 0.0 | - | 0.1 | 0.1 | 0.8 | - | - | - | 0.0 | 0.2 | - | - | 0.0 |
| 2000 | - | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.7 | - | - | 0.1 | - | 0.3 | - | - | - |
| 2005 | - | - | 0.1 | - | 0.0 | - | - | 0.2 | 0.7 | 0.0 | - | 0.3 | - | 0.1 | - | - | - |
| 2010 | - | 0.1 | 0.0 | - | - | - | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.1 | - | 0.3 | - | 0.0 | - |
| 2015 | 0.0 | 0.3 | 0.2 | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.8 | 0.0 | - | - | - | 0.2 | 0.0 | 0.0 | 0.1 |
| 2020 | - | 0.3 | 0.3 | - | 0.0 | - | 0.0 | 0.1 | 0.4 | - | - | - | - | 0.2 | - | 0.1 | - |
| 2025 | - | 0.3 | 0.1 | 0.0 | - | - | 0.0 | 0.2 | 1.0 | - | - | - | 0.0 | 0.4 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Zigadenus paniculatus (foothill deathcamas) |
|---|---|
| year | Nested |
| 1995 | - |
| 2000 | 3 |
| 2005 | 1 |
| 2010 | 2 |
| 2015 | 5 |
| 2020 | 10 |
| 2025 | 11 |
| year | Average Cover (%) |
| 1995 | - |
| 2000 | 0.0 |
| 2005 | 0.0 |
| 2010 | 0.0 |
| 2015 | 0.0 |
| 2020 | 0.0 |
| 2025 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08B-06.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Mahonia repens (creeping barberry) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 1.5 | 0 | - | 8.2 | 13.7 | 2.4 | - | - | 0.2 | 0.6 | - | 0.6 | - | 0.6 |
| 2010 | 2 | 0.4 | - | 8.8 | 16.2 | 4.8 | 0.2 | 0.2 | 0.6 | 1.2 | 0 | 1.1 | - | 0.7 |
| 2015 | 1.8 | 0.5 | - | 10.1 | 14.4 | 4.6 | 0.3 | - | 0.6 | 1.6 | - | 0.6 | - | 0.7 |
| 2020 | 1.9 | 0 | - | 6.9 | 15.6 | 4.2 | 0.1 | 0.4 | 0.5 | 1.5 | - | 1.1 | - | 0.7 |
| 2025 | 2.4 | 0.5 | - | 7.5 | 18.7 | 3.8 | 0 | 0.5 | 1 | 0.5 | - | 1.8 | - | 1.3 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | |
| 1995 | 0.9 | - | - | 5.6 | 16.1 | 1.7 | - | - | 0.7 | 0.6 | - | 1.4 | 0.2 | 0.3 |
| 2000 | 0.2 | - | - | 6.8 | 12.2 | 1.7 | - | - | 0.2 | 0.2 | 0.3 | 0.3 | - | 0.2 |
| 2005 | 0.0 | 0.2 | - | 8.6 | 12.9 | 2.2 | - | - | 0.3 | 0.6 | - | 0.2 | - | 0.6 |
| 2010 | 0.8 | 0.5 | 0.0 | 6.2 | 12.5 | 2.5 | 0.0 | 0.0 | 0.8 | 0.5 | 0.1 | 0.5 | - | 0.5 |
| 2015 | 0.7 | 0.2 | - | 6.8 | 10.2 | 2.6 | 0.1 | - | 0.5 | 1.1 | 0.1 | 0.0 | - | 0.5 |
| 2020 | 0.9 | 0.3 | - | 6.7 | 11.2 | 2.1 | 0.3 | 0.0 | 0.4 | 0.5 | - | 0.2 | - | 1.8 |
| 2025 | 1.3 | 0.3 | - | 8.9 | 15.1 | 3.6 | 0.0 | 0.1 | 0.6 | 0.8 | 0.0 | 0.8 | - | 1.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08B-06.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 75 | 0 | 0 | 159/180 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 140/168 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 134/150 |
| 2010 | 60 | - | 0 | 100 | 0 | 67 | 0 | 0 | 120/139 |
| 2015 | 40 | - | 0 | 50 | 50 | 50 | 50 | 0 | 131/150 |
| 2020 | 80 | - | 0 | 100 | 0 | 50 | 50 | 0 | 143/159 |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 11/17 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/11 |
| 2005 | 240 | 40 | 17 | 83 | 0 | 33 | 8 | 0 | 31/27 |
| 2010 | 200 | - | 0 | 100 | 0 | 20 | 0 | 0 | 24/30 |
| 2015 | 560 | 80 | 7 | 93 | 0 | 0 | 0 | 0 | 29/31 |
| 2020 | 360 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/29 |
| 2025 | 560 | - | 11 | 89 | 0 | 7 | 0 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 60 | - | 0 | 67 | 33 | 33 | 67 | 0 | 44/68 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 28/61 |
| 2010 | 40 | - | 0 | 50 | 50 | 0 | 100 | 50 | 18/23 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 80 | - | 0 | 25 | 75 | 0 | 100 | 75 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2140 | - | 8 | 74 | 18 | 22 | 38 | 6 | 35/66 |
| 2000 | 2220 | - | 5 | 58 | 37 | 44 | 5 | 19 | 41/72 |
| 2005 | 1720 | 340 | 1 | 70 | 29 | 36 | 28 | 19 | 50/78 |
| 2010 | 1500 | 40 | 8 | 69 | 23 | 51 | 16 | 31 | 45/84 |
| 2015 | 1560 | 20 | 8 | 63 | 30 | 47 | 33 | 27 | 45/92 |
| 2020 | 1480 | 80 | 10 | 68 | 23 | 43 | 20 | 23 | 44/78 |
| 2025 | 2220 | 340 | 28 | 54 | 18 | 11 | 3 | 18 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 1680 | 60 | 8 | 89 | 2 | 58 | 35 | 1 | 85/128 |
| 2000 | 1060 | 20 | 0 | 77 | 23 | 59 | 19 | 11 | 96/154 |
| 2005 | 1200 | 140 | 17 | 72 | 12 | 12 | 63 | 3 | 96/140 |
| 2010 | 1060 | 80 | 21 | 72 | 8 | 85 | 11 | 13 | 101/146 |
| 2015 | 1200 | 100 | 5 | 68 | 27 | 18 | 75 | 48 | 87/121 |
| 2020 | 1140 | 20 | 7 | 75 | 18 | 61 | 25 | 19 | 86/139 |
| 2025 | 1420 | 60 | 6 | 83 | 11 | 34 | 25 | 11 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 1520 | - | 3 | 97 | 0 | 1 | 0 | 0 | 26/37 |
| 2000 | 2040 | - | 5 | 88 | 7 | 1 | 1 | 17 | 24/29 |
| 2005 | 2340 | - | 7 | 92 | 2 | 7 | 4 | 1 | 28/35 |
| 2010 | 1800 | - | 2 | 98 | 0 | 1 | 0 | 0 | 31/42 |
| 2015 | 2300 | 20 | 7 | 92 | 1 | 4 | 3 | 2 | 31/43 |
| 2020 | 1920 | - | 2 | 93 | 5 | 0 | 0 | 10 | 30/45 |
| 2025 | 2340 | 20 | 1 | 98 | 1 | 6 | 0 | 1 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 13/11 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 0 | 100 | - / - |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/21 |
| 2010 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 19/35 |
| 2015 | 180 | - | 22 | 78 | 0 | 0 | 0 | 0 | 19/32 |
| 2020 | 180 | - | 11 | 78 | 11 | 0 | 0 | 11 | 15/16 |
| 2025 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 1360 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 8/15 |
| 2000 | 1200 | - | 15 | 85 | 0 | 0 | 0 | 0 | 7/12 |
| 2005 | 1440 | - | 1 | 92 | 7 | 0 | 0 | 7 | 5/8 |
| 2010 | 2820 | - | 14 | 87 | 0 | 0 | 0 | 0 | 9/12 |
| 2015 | 2540 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/11 |
| 2020 | 1900 | 20 | 8 | 92 | 0 | 0 | 0 | 0 | 8/10 |
| 2025 | 5120 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 1180 | 20 | 2 | 97 | 2 | 0 | 0 | 2 | 8/28 |
| 2000 | 1260 | - | 24 | 73 | 3 | 2 | 0 | 2 | 5/19 |
| 2005 | 1000 | - | 10 | 90 | 0 | 0 | 0 | 0 | 7/30 |
| 2010 | 1000 | - | 2 | 98 | 0 | 0 | 0 | 0 | 7/28 |
| 2015 | 1780 | - | 3 | 97 | 0 | 0 | 0 | 0 | 8/24 |
| 2020 | 1420 | 40 | 14 | 86 | 0 | 0 | 0 | 13 | 7/37 |
| 2025 | 2420 | - | 22 | 76 | 2 | 2 | 0 | 3 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/15 |
| 2000 | 180 | 20 | 0 | 89 | 11 | 0 | 0 | 22 | 12/23 |
| 2005 | 60 | - | 0 | 100 | 0 | 33 | 0 | 0 | 7/10 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/10 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/10 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/11 |
| 2025 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 140 | - | 0 | 100 | 0 | 57 | 0 | 0 | 51/139 |
| 2000 | 60 | - | 0 | 100 | 0 | 33 | 0 | 0 | 47/126 |
| 2005 | 80 | - | 25 | 75 | 0 | 25 | 50 | 0 | 49/132 |
| 2010 | 60 | - | 33 | 67 | 0 | 67 | 33 | 33 | 54/147 |
| 2015 | 140 | - | 0 | 86 | 14 | 57 | 43 | 14 | 55/133 |
| 2020 | 100 | - | 20 | 80 | 0 | 0 | 60 | 0 | 55/139 |
| 2025 | 200 | - | 0 | 90 | 10 | 40 | 0 | 10 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 38/63 |
| 2000 | - | - | - | - | - | - | - | - | 54/181 |
| 2005 | - | - | - | - | - | - | - | - | 42/84 |
| 2010 | - | - | - | - | - | - | - | - | 57/150 |
| 2015 | - | - | - | - | - | - | - | - | 54/76 |
| 2020 | - | - | - | - | - | - | - | - | 41/84 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 320 | - | 13 | 88 | 0 | 13 | 0 | 0 | 24/36 |
| 2000 | 260 | - | 15 | 69 | 15 | 0 | 0 | 62 | 25/37 |
| 2005 | 240 | - | 8 | 92 | 0 | 25 | 8 | 0 | 18/38 |
| 2010 | 260 | - | 23 | 77 | 0 | 77 | 0 | 8 | 25/47 |
| 2015 | 300 | - | 7 | 87 | 7 | 40 | 7 | 7 | 25/53 |
| 2020 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/51 |
| 2025 | 320 | 20 | 25 | 75 | 0 | 6 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

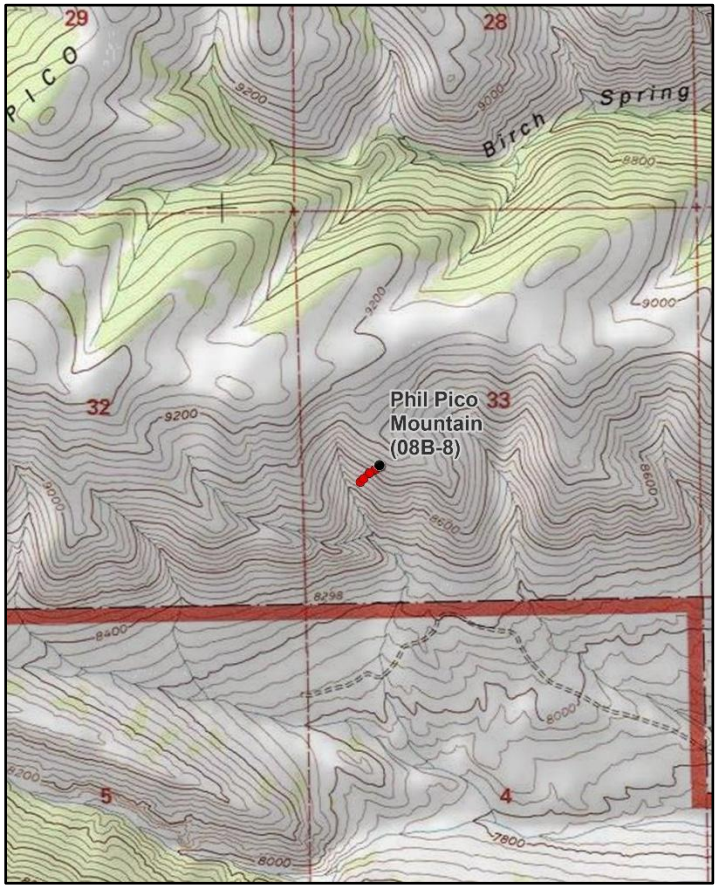
**Table 08B-06.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

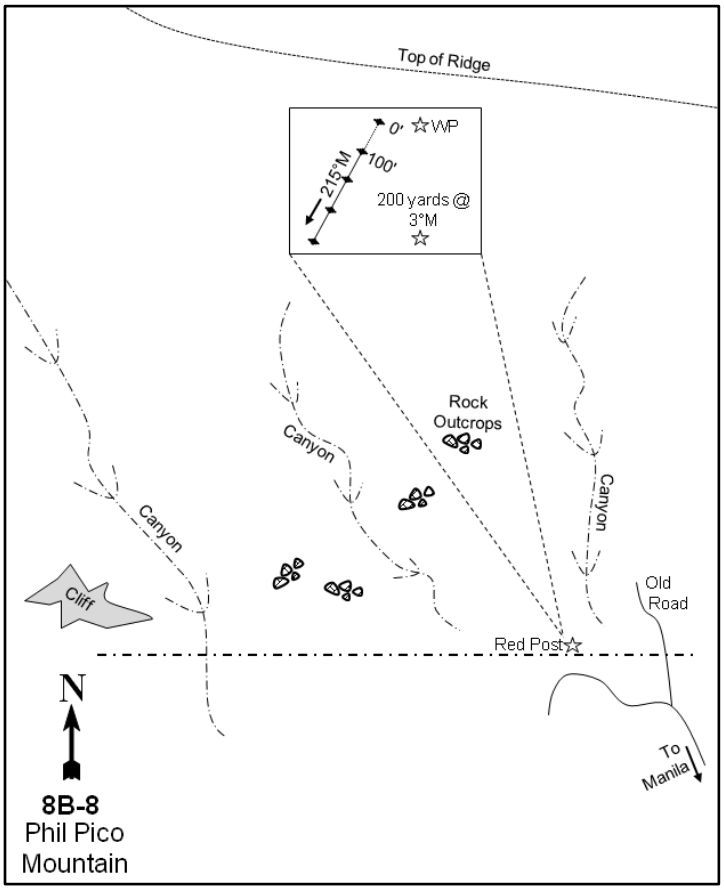
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 1 | - | - | - | 100 | - | 25.0 |
| 2025 | 3 | - | - | 50 | 50 | - | 15.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 7 | - | 100 | - | - | - | 7.0 |
| 2020 | 7 | - | - | 100 | - | - | 5.0 |
| 2025 | 6 | - | - | 100 | - | - | 11.0 |

**Table 08B-06.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 13.3 | 4.0 | 12.6 | 0.0 | 9.7 | 0.0 | **69.6** | Fair-Good |
| 2000 | 27.5 | 7.0 | 0.9 | 30.0 | 0.0 | 10.0 | 0.0 | **75.4** | Good |
| 2005 | 30.0 | 10.0 | 5.3 | 30.0 | 0.0 | 8.8 | 0.0 | **84.1** | Good |
| 2010 | 30.0 | 11.6 | 7.8 | 28.3 | 0.0 | 10.0 | 0.0 | **87.7** | Good |
| 2015 | 30.0 | 6.5 | 2.8 | 23.4 | -0.1 | 10.0 | 0.0 | **72.6** | Good |
| 2020 | 30.0 | 9.9 | 3.9 | 24.0 | -0.2 | 10.0 | 0.0 | **77.6** | Good |
| 2025 | 30.0 | 11.4 | 7.1 | 28.3 | 0.0 | 10.0 | 0.0 | **86.8** | Good |

# PHIL PICO MOUNTAIN - STUDY NO. 08B-8




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Phil Pico Mountain N; Township 3N, Range 18E, Section 33 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 591757 East 4533640 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9080 |
| Transect Bearing | 215° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | No Rebar |

## Directions to Site

From the Wyoming-Utah state line, drive south on State Route (SR) 43 for 1.9 miles to a road (Route 166) on the right (south). Turn right and follow Route 166 for 3.6 miles to an intersection. Turn to the right and go 1.6 miles to another fork. Bear right before crossing the creek and go 0.9 miles on a rough road to the Forest Service boundary fence. Continue 0.8 miles west along the fence. Stop where the road turns left (away from the fence) by a red post in the fence. The study is located on the slope and below the ridge to the northwest. From the red witness post along the fence, hike about 1/4 mile at 322 degrees magnetic up across the slope to a large square rock outcrop. Continue hiking about 200 yards directly north to the study site. The 0-foot baseline stake is marked with browse tag #9080.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | No data |
| Elevation | 8,800ft (2,682m) |
| Aspect | Southwest |
| Slope | 55-65% |
| Sample Dates | 09/06/1995, 08/02/2000, 08/01/2005, 08/11/2010, 06/23/2015, 07/21/2020, 07/14/2025 |

## Wildlife Habitat and Vegetation History

**Table 08B-08.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | year-long |

**Table 08B-08.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Alderleaf Mountain Mahogany | No Encroachment |
| 1995 | Alderleaf Mountain Mahogany | No Encroachment |
| 2000 | Alderleaf Mountain Mahogany | No Encroachment |
| 2005 | Alderleaf Mountain Mahogany | No Encroachment |
| 2010 | Alderleaf Mountain Mahogany | No Encroachment |
| 2015 | Alderleaf Mountain Mahogany | No Encroachment |
| 2020 | Alderleaf Mountain Mahogany | No Encroachment |
| 2025 | Alderleaf Mountain Mahogany | No Encroachment |

## Site Notes

This site is located just below a narrow windswept ridge. Open sagebrush (*Artemisia* spp.) and grass communities are found on the upper slopes and ridge tops in the area. These slopes are used mostly by wintering elk and to a lesser extent, deer. Cattle grazing in the area is managed by the Utah State Institutional Trust Lands Administration (SITLA), but cattle tend to utilize the valley bottoms and gentle slopes.

## Soils

**Table 08B-08.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.5 | 66.9 | 20.1 | 13.0 | 5.2 | 8.8 | 83.2 | 0.8 | 09/06/1995 |
| Sandy Loam | 7.0 | 69.0 | 20.1 | 10.9 | 3.7 | 5.2 | 86.4 | 1.4 | 08/02/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Very Steep Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1988, the plant community on this site has remained in a stable state with alderleaf mountain mahogany (*Cercocarpus montanus*) as the dominant species (Pre-1992 Data), the cover of which has increased overall. Other preferred browse species such as mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and slender buckwheat (*Eriogonum microthecum*) have also been present, but they have provided less cover than mountain mahogany (Table 08B-08.12, Table 08B-08.13). The herbaceous understory has remained diverse, abundant, and has been primarily composed of the native perennial grass species bluebunch wheatgrass (*Pseudoroegneria spicata*). The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed in all sample years, but in generally low amounts. Perennial forbs have contributed low to moderate amounts of cover over the sample period (Table 08B-08.7, Table 08B-08.10, Table 08B-08.11). Barring a major disturbance such as a wildfire, this site will likely remain in this or a similar state in future sample years.

Condition of this site as mule deer winter range has remained good since 1995. Factors that negatively influence this site's condition include limited recruitment of young plants into the preferred browse community, and the presence of annual grass (Table 08B-08.7, Table 08B-08.13, Table 08B-08.15). Pellet transect data indicates that deer presence was low in most sample years but was moderate in 2025. Elk presence was high in 2000 and 2005, but it has remained moderate since 2010 (Table 08B-08.9). Sagebrush utilization has been light to moderate in most sample years but has been increasing; 82% of sagebrush plants sampled in density strips were moderately to heavily utilized in 2025. In addition, 80% or more of alderleaf mountain mahogany plants were moderately to heavily utilized in most years sampled (Table 08B-08.13). On-site observations for 2025 noted little to no utilization of the herbaceous community and that the browse component was considered to have good primary growth and seed production.

## Trend Summary Tables

**Table 08B-08.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 21.9 | 0.1 | - | - | - | - |
| 2000 | 25.0 | 0.5 | - | - | - | - |
| 2005 | 24.2 | 0.7 | - | 31.3 | 0.8 | - |
| 2010 | 28.0 | 1.3 | - | 42.1 | 1.1 | - |
| 2015 | 29.4 | 0.9 | - | 39.8 | 0.7 | - |
| 2020 | 33.3 | 0.9 | - | 42.2 | 1.7 | - |
| 2025 | 32.8 | 1.6 | - | 44.1 | 0.9 | - |

**Table 08B-08.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 173 | 372 | 96 | 208 | 2.5 | 13.9 | 0.5 | 2.9 |
| 2000 | 55 | 393 | 32 | 194 | 0.2 | 26.8 | 0.1 | 3.9 |
| 2005 | 23 | 355 | 62 | 218 | 0.1 | 16.9 | 0.2 | 3.4 |
| 2010 | 34 | 365 | 29 | 182 | 0.1 | 17.1 | 0.1 | 3.6 |
| 2015 | 60 | 400 | 24 | 215 | 1.2 | 21.9 | 0.1 | 8.9 |
| 2020 | 177 | 390 | 29 | 206 | 2.4 | 23.6 | 0.1 | 4.6 |
| 2025 | 150 | 332 | 115 | 219 | 1.0 | 22.1 | 0.7 | 7.1 |

**Table 08B-08.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 2.3 | 0.0 | 39.9 | 11.6 | 23.4 | 39.1 |
| 2000 | 4.5 | 0.1 | 36.6 | 29.9 | 19.6 | 56.9 |
| 2005 | 12.3 | 0.0 | 22.1 | 23.0 | 18.7 | 43.1 |
| 2010 | 7.9 | - | 25.4 | 19.0 | 14.1 | 54.2 |
| 2015 | 16.2 | 0.0 | 31.8 | 18.5 | 19.6 | 51.1 |
| 2020 | 2.1 | 0.0 | 35.6 | 16.7 | 19.0 | 53.8 |
| 2025 | 7.8 | - | 22.3 | 14.3 | 21.5 | 57.7 |

**Table 08B-08.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 25 | 51 | 8 |
| 2000 | - | 7 | 26 | - |
| 2005 | - | 15 | 37 | 9 |
| 2010 | - | 10 | 12 | - |
| 2015 | - | 10 | 27 | 7 |
| 2020 | - | 19 | 21 | 5 |
| 2025 | - | 24 | 21 | 4 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 7.4 (18.2) | 40.2 (99.3) | - |
| 2005 | 2.2 (5.4) | 18.7 (46.3) | 48.3 (119.2) | - |
| 2010 | - | 14.7 (36.4) | 25.5 (62.9) | - |
| 2015 | - | 9.4 (23.2) | 20.8 (51.3) | - |
| 2020 | - | 18.1 (44.7) | 34.2 (84.4) | - |
| 2025 | - | 36.2 (89.4) | 28.8 (71.2) | - |

**Table 08B-08.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Koeleria macrantha (prairie Junegrass) | Leucopoa kingii (spike fescue) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1995 | 92 | 173 | 37 | 7 | 2 | - | 23 | 335 |
| 2000 | 116 | 55 | 9 | 5 | 5 | 2 | 22 | 365 |
| 2005 | 67 | 23 | 13 | 18 | - | 1 | 15 | 328 |
| 2010 | 71 | 34 | 54 | 18 | 3 | - | 5 | 326 |
| 2015 | 38 | 60 | 66 | 4 | - | - | 10 | 381 |
| 2020 | 118 | 177 | 30 | 15 | 7 | 11 | 37 | 331 |
| 2025 | 94 | 150 | 42 | 21 | 2 | - | 25 | 250 |
| year | Average Cover (%) | | | | | | | |
| 1995 | 2.2 | 2.5 | 0.5 | 0.1 | 0.0 | - | 0.2 | 11.0 |
| 2000 | 6.5 | 0.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.2 | 19.6 |
| 2005 | 2.7 | 0.1 | 0.3 | 0.4 | - | 0.0 | 0.1 | 13.4 |
| 2010 | 2.3 | 0.1 | 2.2 | 0.3 | 0.0 | - | 0.0 | 12.2 |
| 2015 | 2.4 | 1.2 | 1.5 | 0.1 | - | - | 0.2 | 17.7 |
| 2020 | 6.0 | 2.4 | 1.1 | 0.3 | 0.1 | 0.2 | 0.3 | 15.6 |
| 2025 | 8.4 | 1.0 | 2.0 | 0.4 | 0.0 | - | 0.1 | 11.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08B-08.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus purshii (woollypod milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Camelina microcarpa[ai] (littlepod false flax) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chaetopappa ericoides (rose heath) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 7 | 4 | 7 | - | - | - | - | - | - | 24 | - | - | 19 | 2 |
| 2000 | - | - | - | 6 | 3 | 8 | - | - | 28 | - | - | 3 | 20 | - | - | 3 | 5 |
| 2005 | - | 2 | - | 15 | 2 | 3 | - | - | 39 | - | - | - | 24 | 1 | 4 | 3 | 10 |
| 2010 | - | - | - | - | 2 | 12 | - | 2 | - | - | - | 6 | 13 | 4 | - | 7 | 11 |
| 2015 | 1 | - | - | 2 | - | 8 | 3 | 2 | 9 | - | - | 7 | 11 | - | - | - | 11 |
| 2020 | - | - | - | 7 | - | 1 | 6 | - | 16 | - | 1 | - | 29 | 4 | - | - | 3 |
| 2025 | - | - | 2 | 1 | 3 | 8 | 1 | - | 43 | 2 | 8 | - | 15 | - | - | 8 | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 0.0 | 0.1 | 0.2 | - | - | - | - | - | - | 0.1 | - | - | 0.1 | 0.1 |
| 2000 | - | - | - | 0.0 | 0.2 | 0.2 | - | - | 0.1 | - | - | 0.0 | 0.1 | - | - | 0.0 | 0.0 |
| 2005 | - | 0.0 | - | 0.0 | 0.0 | 0.2 | - | - | 0.1 | - | - | - | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 |
| 2010 | - | - | - | - | 0.1 | 0.1 | - | 0.0 | - | - | - | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.4 |
| 2015 | 0.0 | - | - | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.1 | - | - | 0.2 | 0.0 | - | - | - | 0.6 |
| 2020 | - | - | - | 0.0 | - | 0.0 | 0.2 | - | 0.0 | - | 0.0 | - | 0.1 | 0.0 | - | - | 0.3 |
| 2025 | - | - | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | - | 0.3 | 0.0 | 0.1 | - | 0.1 | - | - | 0.1 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Erigeron (fleabane) | Erysimum (wallflower) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Machaeranthera canescens (hoary tansyaster) | Microsteris gracilis[a] (slender phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 4 | - | - | 37 | - | 53 | 69 | 1 | - | 3 | 8 | 4 | 6 | - | - | 17 | 1 |
| 2000 | 2 | - | - | 62 | - | 6 | 5 | 3 | - | - | - | - | 2 | 1 | 3 | 20 | - |
| 2005 | 15 | 4 | - | 93 | - | 19 | 3 | - | - | 4 | 7 | - | 0 | 1 | - | 10 | - |
| 2010 | - | - | - | 63 | 1 | - | 19 | - | - | - | - | 3 | 8 | 4 | 3 | 38 | - |
| 2015 | 1 | - | 2 | 94 | - | 10 | 4 | 1 | 20 | 2 | 11 | - | 9 | - | - | 37 | - |
| 2020 | 5 | - | - | 131 | 3 | 6 | 5 | 5 | 2 | 1 | 5 | - | 6 | 3 | - | 1 | - |
| 2025 | 1 | - | - | 83 | - | - | 36 | - | - | 8 | 26 | 16 | 15 | 1 | 7 | 115 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | - | 0.5 | - | 0.5 | 0.4 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.1 | 0.0 |
| 2000 | 0.0 | - | - | 1.1 | - | 0.1 | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.5 | - |
| 2005 | 0.1 | 0.0 | - | 1.2 | - | 0.2 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.1 | - |
| 2010 | - | - | - | 0.9 | 0.0 | - | 0.1 | - | - | - | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.4 | - |
| 2015 | 0.0 | - | 0.0 | 2.9 | - | 0.1 | 0.0 | 0.0 | 0.3 | 0.2 | 0.1 | - | 0.1 | - | - | 1.1 | - |
| 2020 | 0.0 | - | - | 2.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - |
| 2025 | 0.0 | - | - | 1.0 | - | - | 0.1 | - | - | 0.1 | 0.1 | 0.1 | 0.5 | 0.1 | 0.1 | 2.7 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Oenothera (evening primrose) | Orogenia linearifolia (Great Basin Indian potato) | Oxytropis sericea (white locoweed) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Physaria acutifolia (sharpleaf twinpod) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Trifolium (clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1995 | - | - | 2 | 10 | - | 37 | - | 25 | - | 65 | - | 2 | - | - | 2 | - |
| 2000 | 9 | - | 15 | 8 | - | 23 | - | 44 | 5 | 31 | 8 | - | 2 | - | - | - |
| 2005 | - | - | - | 5 | 14 | 28 | - | 43 | 2 | 15 | 19 | 10 | - | 4 | - | - |
| 2010 | - | - | 9 | 3 | 5 | 28 | 6 | 38 | - | 19 | 6 | 1 | 1 | 9 | 8 | - |
| 2015 | - | 2 | - | 4 | - | 43 | - | 11 | 18 | 30 | 15 | 1 | - | 2 | 4 | 1 |
| 2020 | - | - | 1 | 2 | - | 29 | - | 55 | - | 12 | 14 | - | - | - | - | - |
| 2025 | 2 | - | - | 4 | 5 | 37 | - | 43 | - | 8 | - | - | - | 3 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.2 | 0.0 | - | 0.4 | - | 0.2 | - | 0.5 | - | 0.0 | - | - | 0.0 | - |
| 2000 | 0.1 | - | 0.3 | 0.1 | - | 0.4 | - | 0.4 | 0.0 | 0.2 | 0.1 | - | 0.0 | - | - | - |
| 2005 | - | - | - | 0.0 | 0.1 | 0.2 | - | 0.4 | 0.0 | 0.1 | 0.1 | 0.1 | - | 0.0 | - | - |
| 2010 | - | - | 0.2 | 0.1 | 0.0 | 0.3 | 0.0 | 0.6 | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | - |
| 2015 | - | 0.0 | - | 0.1 | - | 1.3 | - | 0.1 | 0.6 | 0.6 | 0.3 | 0.0 | - | 0.0 | 0.2 | 0.0 |
| 2020 | - | - | 0.0 | 0.0 | - | 0.4 | - | 0.7 | - | 0.2 | 0.1 | - | - | - | - | - |
| 2025 | 0.0 | - | - | 0.2 | 0.2 | 0.7 | - | 1.0 | - | 0.1 | - | - | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08B-08.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Krascheninnikovia lanata[p] (winterfat) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 3.8 | 3.2 | 22.3 | 0.6 | - | 1.3 | - | 0.7 | 0.2 |
| 2010 | 0.4 | 7.1 | 3.1 | 28.7 | 0.9 | - | 2.7 | - | 0.1 | 0.2 |
| 2015 | 0.1 | 3 | 5.5 | 27.4 | 0.7 | - | 2.4 | 0.8 | 0.6 | - |
| 2020 | 0.6 | 1.4 | 4.3 | 31.7 | 0.9 | 0.6 | 4.1 | 0.1 | - | 0.2 |
| 2025 | 0.3 | 1.7 | 3.2 | 35.1 | 0.3 | 0.3 | 3 | - | 0.8 | 0.3 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | 0.0 | 0.9 | 1.5 | 17.9 | 0.1 | - | 1.6 | - | 0.0 | 0.1 |
| 2000 | 0.0 | 1.0 | 2.7 | 19.4 | 0.5 | - | 1.5 | - | 0.3 | - |
| 2005 | - | 2.9 | 1.4 | 18.3 | 0.5 | - | 0.9 | 0.1 | 0.6 | 0.2 |
| 2010 | 0.1 | 4.8 | 1.7 | 19.7 | 0.8 | - | 1.7 | - | 0.0 | 0.5 |
| 2015 | 0.1 | 2.8 | 3.0 | 21.2 | 0.7 | - | 2.1 | 0.1 | 0.1 | 0.2 |
| 2020 | 0.1 | 1.7 | 3.7 | 25.3 | 0.7 | 0.0 | 2.3 | 0.0 | 0.1 | 0.1 |
| 2025 | 0.1 | 2.5 | 2.0 | 24.4 | 0.6 | 0.4 | 3.2 | - | 0.6 | 0.6 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08B-08.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 120 | 80 | 83 | 17 | 0 | 0 | 17 | 0 | 40/24 |
| 2000 | 340 | - | 94 | 6 | 0 | 6 | 0 | 0 | 41/31 |
| 2005 | 240 | - | 92 | 8 | 0 | 100 | 0 | 0 | 75/103 |
| 2010 | 100 | - | 80 | 20 | 0 | 0 | 0 | 0 | 38/52 |
| 2015 | 160 | - | 88 | 13 | 0 | 13 | 0 | 50 | 28/53 |
| 2020 | 220 | - | 27 | 73 | 0 | 0 | 73 | 0 | 79/100 |
| 2025 | 100 | - | 0 | 100 | 0 | 60 | 40 | 0 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 3900 | 160 | 11 | 89 | 0 | 0 | 0 | 0 | 23/19 |
| 2000 | 3440 | - | 8 | 91 | 1 | 1 | 0 | 1 | 11/18 |
| 2005 | 5540 | 960 | 12 | 88 | 0 | 4 | 1 | 3 | 26/29 |
| 2010 | 7460 | 840 | 10 | 90 | 0 | 38 | 0 | 3 | 13/28 |
| 2015 | 7820 | 200 | 13 | 87 | 0 | 0 | 0 | 0 | 18/19 |
| 2020 | 3520 | 20 | 5 | 93 | 2 | 2 | 1 | 2 | 10/14 |
| 2025 | 3940 | 140 | 8 | 92 | 0 | 7 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1000 | 20 | 10 | 68 | 22 | 46 | 10 | 12 | 27/60 |
| 2000 | 1100 | - | 13 | 69 | 18 | 20 | 6 | 13 | 31/56 |
| 2005 | 840 | 120 | 7 | 76 | 17 | 24 | 14 | 19 | 38/66 |
| 2010 | 860 | - | 5 | 86 | 9 | 35 | 35 | 26 | 29/63 |
| 2015 | 1000 | - | 12 | 74 | 14 | 12 | 20 | 30 | 25/55 |
| 2020 | 900 | - | 2 | 89 | 9 | 33 | 31 | 9 | 36/59 |
| 2025 | 760 | - | 5 | 92 | 3 | 58 | 24 | 13 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 3120 | 160 | 18 | 80 | 3 | 34 | 54 | 6 | 75/100 |
| 2000 | 3120 | - | 13 | 72 | 15 | 36 | 40 | 11 | 73/102 |
| 2005 | 3680 | 60 | 16 | 78 | 7 | 9 | 84 | 7 | 74/98 |
| 2010 | 3760 | 20 | 12 | 87 | 1 | 23 | 40 | 4 | 84/106 |
| 2015 | 3440 | 20 | 15 | 83 | 2 | 34 | 48 | 4 | 62/89 |
| 2020 | 3440 | 40 | 12 | 84 | 5 | 13 | 83 | 4 | 80/109 |
| 2025 | 3860 | - | 7 | 89 | 4 | 34 | 46 | 4 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 400 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/36 |
| 2000 | 440 | - | 0 | 100 | 0 | 0 | 9 | 0 | 22/35 |
| 2005 | 400 | - | 0 | 100 | 0 | 10 | 0 | 0 | 26/44 |
| 2010 | 400 | - | 0 | 100 | 0 | 0 | 0 | 5 | 29/42 |
| 2015 | 620 | - | 7 | 94 | 0 | 0 | 0 | 0 | 20/31 |
| 2020 | 540 | - | 0 | 100 | 0 | 0 | 0 | 11 | 22/32 |
| 2025 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/25 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/47 |
| 2025 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 2540 | 40 | 2 | 98 | 0 | 0 | 0 | 0 | 16/30 |
| 2000 | 2060 | - | 1 | 97 | 2 | 0 | 0 | 1 | 12/22 |
| 2005 | 2100 | 100 | 1 | 99 | 0 | 7 | 1 | 0 | 13/26 |
| 2010 | 2180 | - | 2 | 98 | 0 | 0 | 0 | 6 | 15/30 |
| 2015 | 2620 | - | 10 | 90 | 0 | 10 | 1 | 0 | 14/28 |
| 2020 | 3060 | - | 1 | 99 | 0 | 16 | 0 | 0 | 15/26 |
| 2025 | 2200 | 40 | 2 | 98 | 0 | 4 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 14/21 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/38 |
| 2020 | - | - | - | - | - | - | - | - | 13/14 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

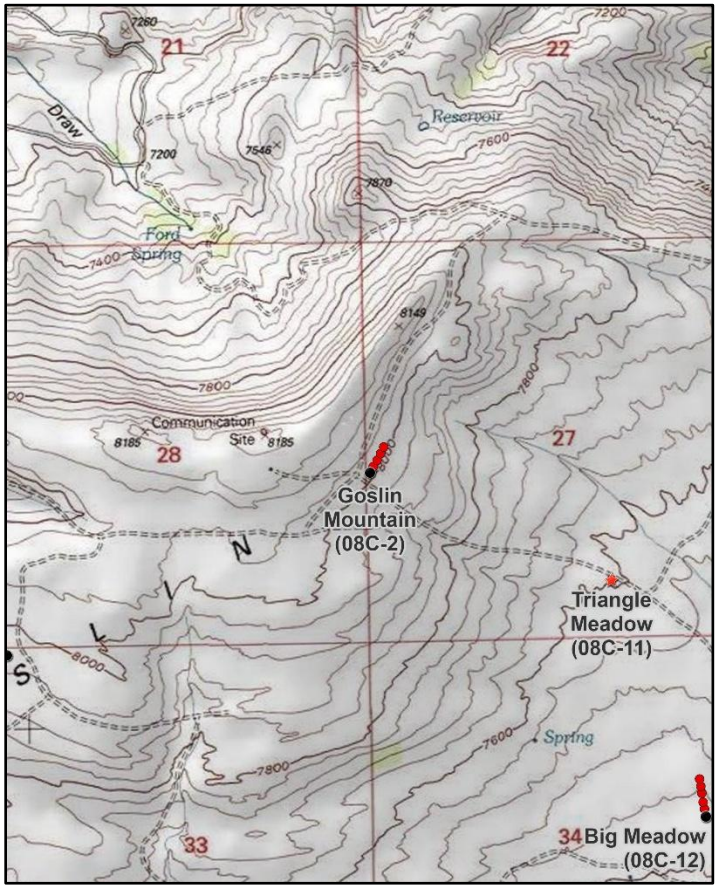
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Kraschenninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/33 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 17/22 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/24 |
| 2015 | 180 | - | 0 | 100 | 0 | 0 | 11 | 0 | 17/21 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/19 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 9/24 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 240 | 40 | 42 | 58 | 0 | 0 | 0 | 0 | 22/61 |
| 2000 | 300 | - | 27 | 73 | 0 | 0 | 0 | 0 | 20/48 |
| 2005 | 160 | 20 | 0 | 100 | 0 | 0 | 38 | 0 | 31/189 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/46 |
| 2015 | 180 | - | 11 | 89 | 0 | 0 | 0 | 0 | 29/58 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/39 |
| 2025 | 240 | - | 0 | 100 | 0 | 50 | 25 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/32 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/30 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/25 |
| 2010 | 160 | - | 13 | 88 | 0 | 13 | 0 | 0 | 22/36 |
| 2015 | - | - | - | - | - | - | - | - | 24/49 |
| 2020 | 120 | - | 0 | 100 | 0 | 33 | 0 | 0 | 18/27 |
| 2025 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

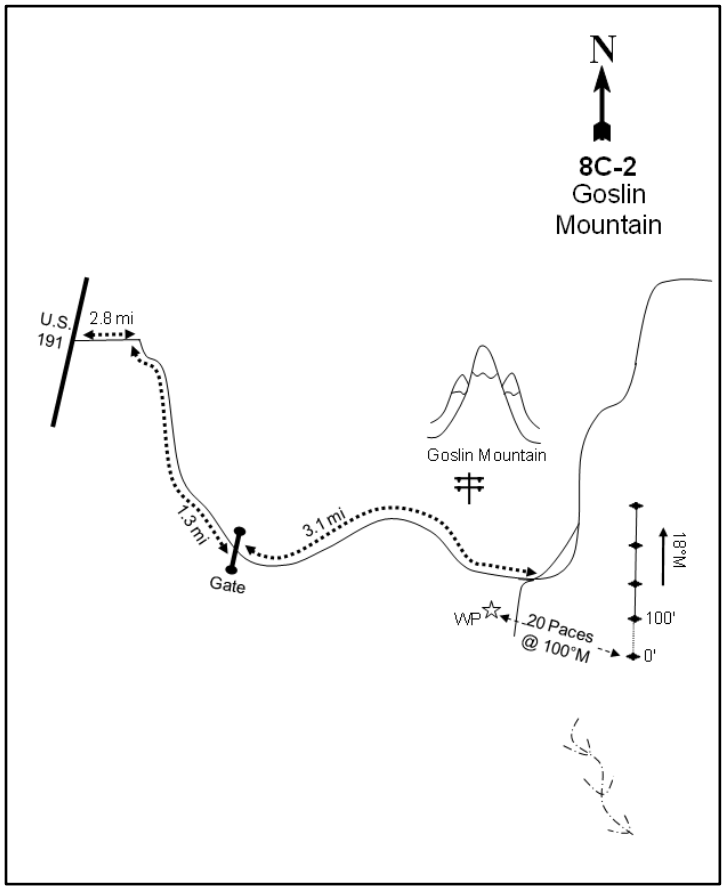
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08B-08.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 13.9 | 8.0 | 27.9 | -1.9 | 5.8 | 0.0 | **83.7** | Good |
| 2000 | 30.0 | 10.7 | 6.1 | 30.0 | -0.1 | 7.8 | 0.0 | **84.5** | Good |
| 2005 | 30.0 | 13.0 | 6.8 | 30.0 | 0.0 | 6.9 | 0.0 | **86.7** | Good |
| 2010 | 30.0 | 14.6 | 5.6 | 30.0 | -0.1 | 7.2 | 0.0 | **87.3** | Good |
| 2015 | 30.0 | 13.9 | 7.0 | 30.0 | -0.9 | 10.0 | 0.0 | **90.0** | Good-Excellent |
| 2020 | 30.0 | 13.7 | 4.8 | 30.0 | -1.8 | 9.2 | 0.0 | **85.9** | Good |
| 2025 | 30.0 | 14.0 | 3.1 | 30.0 | -0.8 | 10.0 | 0.0 | **86.3** | Good |

# GOSLIN MOUNTAIN - STUDY NO. 08C-2




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Goslin Mountain NW; Township 3N, Range 23E, Section 27 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 641583 East 4536489 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 18° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Turn east just before the Wyoming border onto Antelope Flat Road and drive towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain, then proceed 1.3 miles to a gate. Continue up the mountain 3.1 miles to a turn off on the left which goes to a radio tower. A little further down the main road there is a road to the right (south) with the witness post located on the right-hand (west) side of it. Stop here and walk 20 paces at 100 degrees magnetic to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | GOSLIN MOUNTAIN |
| Elevation | 8,030ft (2,448m) |
| Aspect | Southeast |
| Slope | 12% |
| Sample Dates | 08/17/1995, 07/05/2000, 07/28/2005, 08/04/2010, 06/24/2015, 07/21/2020, 07/16/2025 |

**Table 08C-02.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Goslin Mountain Phase 2 Lop and Scatter | 691 | May 2008 | 1221 |

## Wildlife Habitat and Vegetation History

**Table 08C-02.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | crucial | summer |

**Table 08C-02.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

Deer, elk, and antelope utilize the site year-round with less use occurring during severe winters. The area is administered by the Utah Division of Wildlife Resources (DWR), but cattle grazing is permitted in the area as part of the Goslin Mountain allotment managed by the Bureau of Land Management (BLM). The area is also considered important habitat for sage-grouse.

## Soils

**Table 08C-02.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.2 | 69.3 | 16.2 | 14.6 | 2.6 | 4.6 | 121.6 | 0.5 | 07/05/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1982-1988 - Mountain Big Sagebrush Super-Dominance State: Community Phase 3.1<br>1995-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) has been the dominant shrub species on this site since study establishment in 1982 (Photos, Pre-1992 Data). Other preferred browse species such as antelope bitterbrush (*Purshia tridentata*), mountain snowberry (*Symphoricarpos oreophilus*), and Utah serviceberry (*Amelanchier utahensis*) have also been present, but they have contributed less cover than sagebrush (Table 08C-02.12). The herbaceous understory has remained diverse and abundant over the sample period. Native perennial grasses have consistently provided a majority of the herbaceous cover, but perennial forbs also contributed notable cover in 2025. The introduced perennial grass species bulbous bluegrass (*Poa bulbosa*) has been observed in all sample years since 1995 in low (but increasing) amounts (Table 08C-02.7, Table 08C-02.10, Table 08C-02.11). Some conifer encroachment has occurred over the study period. A 2008 lop and scatter treatment (Table 08C-02.1) removed most of the conifer trees on the site and surrounding area, but point-quarter data shows that Rocky Mountain juniper (*Juniperus scopulorum*) and twoneedle pinyon (*Pinus edulis*) were present with low density in 2020 and 2025 (Table 08C-02.14). The continued presence of trees indicates that there may be potential for infilling over time. However, the study site has remained in Early Phase I of woodland succession throughout the sample period (Table 08C-02.4), suggesting that infilling is likely not an immediate concern.

This site likely serves as adequate summer range for mule deer due to the abundant and/or diverse shrub and herbaceous components (Table 08C-02.10, Table 08C-02.11, Table 08C-02.12). Deer presence was high in most sample years but was moderate in 2025according to pellet transect data. During the 2024/25 winter season the area had nearby occurrences of dispersed, collared mule deer (Wildlife Migration Initiative). Elk presence has remained absent to low. Cattle presence has varied between absent and moderate

over time. Utilization of preferred browse has followed no clear trend, but mountain big sagebrush showed signs of high utilization in 1995 and 2015. However, utilization was light for grasses (10-20%) in 2025, while total shrub utilization decreased from 32% in 2020 to 17% in 2025, which may reflect the decrease in wildlife and cattle presence for the same years (Table 08C-02.9, Table 08C-02.13).

## Trend Summary Tables

**Table 08C-02.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 17.5 | 1.1 | - | - | - | - |
| 2000 | 22.0 | 0.3 | - | - | - | - |
| 2005 | 25.5 | 0.7 | - | 28.3 | 5.2 | 1.2 |
| 2010 | 21.6 | 0.5 | - | 31.4 | 1.8 | - |
| 2015 | 21.1 | 0.2 | - | 31.7 | 4.6 | - |
| 2020 | 29.9 | 0.6 | - | 30.7 | 0.5 | - |
| 2025 | 34.3 | 0.3 | - | 39.2 | 0.1 | - |

**Table 08C-02.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 2 | 406 | 317 | 305 | 0.0 | 13.1 | 2.7 | 6.4 |
| 2000 | - | 423 | 107 | 269 | - | 23.8 | 0.6 | 6.8 |
| 2005 | 5 | 407 | 136 | 252 | 0.0 | 20.3 | 0.8 | 9.0 |
| 2010 | - | 392 | 113 | 236 | - | 23.7 | 0.6 | 8.0 |
| 2015 | 5 | 435 | 156 | 274 | 0.2 | 30.4 | 1.0 | 9.6 |
| 2020 | - | 396 | 179 | 181 | - | 22.6 | 1.5 | 9.7 |
| 2025 | - | 416 | 307 | 310 | - | 21.7 | 5.0 | 14.2 |

**Table 08C-02.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 16.7 | 0.1 | 50.7 | 0.8 | 3.3 | 41.6 |
| 2000 | 12.6 | 0.4 | 58.5 | 2.4 | 5.0 | 57.1 |
| 2005 | 17.7 | 0.1 | 34.3 | 0.8 | 4.0 | 54.7 |
| 2010 | 16.6 | 0.0 | 55.0 | 0.7 | 3.6 | 53.4 |
| 2015 | 14.9 | 0.1 | 36.3 | 0.4 | 2.1 | 60.7 |
| 2020 | 18.0 | 0.4 | 56.7 | 0.7 | 3.8 | 56.5 |
| 2025 | 13.8 | 0.1 | 48.5 | 1.0 | 3.6 | 56.0 |

**Table 08C-02.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 5 | 7 | 3 | - | - |
| 2000 | 3 | 4 | 1 | - | 1 |
| 2005 | 6 | 8 | 4 | 3 | 5 |
| 2010 | 3 | 12 | 2 | - | 5 |
| 2015 | 2 | 13 | 7 | - | 13 |
| 2020 | 4 | 24 | 1 | - | 6 |
| 2025 | 1 | 30 | 2 | 1 | 5 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | 14.7 (36.4) | 3.4 (8.3) | - | - |
| 2005 | 8.7 (21.5) | 56.3 (139.0) | 4.0 (9.9) | 61.0 (150.6)* | - |
| 2010 | 6.5 (16.1) | 58.3 (144.0) | 10.0 (24.8) | - | - |
| 2015 | - | 30.8 (76.1) | 0.7 (1.7) | - | - |
| 2020 | 19.6 (48.4) | 79.8 (197.0) | 5.3 (13.2) | - | - |
| 2025 | 2.2 (5.4) | 26.8 (66.2) | - | 8.7 (21.5)* | - |

*Pellets per acre (ha)

**Table 08C-02.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus marginatus (mountain brome) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Dactylis glomerata[i] (orchardgrass) | Danthonia unispicata (onespike danthonia) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Elymus trachycaulus (slender wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leucopoa kingii (spike fescue) | Melica bulbosa (oniongrass) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 99 | 7 | - | 2 | 32 | 1 | 4 | - | 159 | - | 220 | - | 3 | 118 | 4 | 41 |
| 2000 | - | 37 | 95 | 6 | - | 34 | - | 4 | - | 172 | 7 | 159 | 2 | 8 | 173 | 24 | 84 |
| 2005 | - | 70 | 23 | - | 5 | 46 | 0 | 2 | 1 | 210 | - | 150 | - | 8 | 128 | 15 | 146 |
| 2010 | - | 46 | 47 | 20 | - | 37 | - | 3 | - | 168 | 20 | 124 | 14 | 2 | 62 | 18 | 133 |
| 2015 | - | 26 | 46 | - | 5 | 48 | - | 5 | 3 | 200 | 42 | 107 | 2 | - | 84 | 34 | 152 |
| 2020 | 5 | 54 | 20 | 6 | - | 57 | - | 12 | 3 | 177 | 3 | 156 | 14 | 3 | 169 | 70 | 30 |
| 2025 | - | 66 | 2 | 4 | - | 22 | 3 | 6 | - | 272 | - | 159 | - | 3 | 129 | 143 | 77 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 1.6 | 0.1 | - | 0.0 | 0.9 | 0.0 | 1.0 | - | 1.1 | - | 4.5 | - | 0.1 | 2.9 | 0.0 | 0.5 |
| 2000 | - | 0.7 | 2.6 | 0.2 | - | 0.8 | - | 0.0 | - | 2.8 | 0.3 | 7.6 | 0.0 | 0.4 | 3.7 | 0.2 | 2.2 |
| 2005 | - | 1.5 | 1.1 | - | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 2.2 | - | 5.6 | - | 0.4 | 1.6 | 0.7 | 3.3 |
| 2010 | - | 1.5 | 1.8 | 0.5 | - | 0.8 | - | 0.1 | - | 3.1 | 0.2 | 5.4 | 0.4 | 0.1 | 1.6 | 0.3 | 4.0 |
| 2015 | - | 0.9 | 1.9 | - | 0.2 | 1.3 | - | 0.0 | 0.0 | 3.9 | 0.7 | 3.8 | 0.4 | - | 1.7 | 0.8 | 4.9 |
| 2020 | 0.0 | 0.8 | 0.4 | 0.2 | - | 1.2 | - | 0.2 | 0.0 | 3.3 | 0.0 | 5.6 | 0.3 | 0.0 | 4.5 | 2.3 | 1.0 |
| 2025 | - | 1.8 | 0.1 | 0.0 | - | 0.4 | 0.0 | 0.1 | - | 4.5 | - | 4.7 | - | 0.1 | 2.8 | 3.2 | 1.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

| GRASS SPECIES | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|
| year | Nested Frequency | | |
| 1995 | 6 | 25 | 41 |
| 2000 | 51 | 42 | 15 |
| 2005 | 62 | 63 | 27 |
| 2010 | 54 | 35 | 21 |
| 2015 | 96 | 181 | 24 |
| 2020 | 4 | 75 | 17 |
| 2025 | 64 | 27 | 4 |
| year | Average Cover (%) | | |
| 1995 | 0.1 | 0.1 | 0.4 |
| 2000 | 1.4 | 0.4 | 0.6 |
| 2005 | 1.1 | 1.3 | 0.3 |
| 2010 | 2.9 | 0.6 | 0.6 |
| 2015 | 4.9 | 5.2 | 0.1 |
| 2020 | 0.1 | 2.4 | 0.3 |
| 2025 | 2.2 | 0.5 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08C-02.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Arenaria (sandwort) | Astragalus purshii (woollypod milkvetch) | Calochortus nuttallii (sego lily) | Chaenactis douglasii (Douglas' dustymaiden) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cymopterus longipes (longstalk springparsley) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 58 | 148 | - | - | 3 | - | 3 | 20 | 6 | - | 3 | 263 | 159 | - | 5 | 20 |
| 2000 | - | 66 | 38 | - | - | 10 | - | 2 | 36 | 15 | - | - | 25 | 38 | 1 | 3 | 13 |
| 2005 | 5 | 90 | 44 | - | - | 6 | - | 2 | 18 | 6 | - | 4 | 95 | 38 | - | 7 | 8 |
| 2010 | 10 | 3 | 14 | 7 | 1 | - | - | 3 | 15 | 8 | 1 | 2 | 53 | 52 | - | 18 | 9 |
| 2015 | 2 | 122 | 9 | 14 | 4 | 12 | - | 3 | 13 | 1 | - | 1 | 55 | 84 | - | 3 | 15 |
| 2020 | 11 | 20 | 6 | - | - | 3 | - | - | 10 | 2 | - | - | 163 | 29 | - | 3 | 5 |
| 2025 | 8 | 90 | 65 | 7 | - | - | 3 | 6 | 20 | 3 | - | - | 271 | 96 | - | 2 | 16 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.3 | 0.8 | - | - | 0.0 | - | 0.0 | 0.2 | 0.0 | - | 0.0 | 1.5 | 0.8 | - | 0.0 | 0.1 |
| 2000 | - | 1.1 | 0.1 | - | - | 0.1 | - | 0.0 | 0.3 | 0.1 | - | - | 0.1 | 0.3 | 0.0 | 0.0 | 0.1 |
| 2005 | 0.1 | 0.5 | 0.1 | - | - | 0.0 | - | 0.0 | 0.1 | 0.1 | - | 0.0 | 0.4 | 0.1 | - | 0.1 | 0.1 |
| 2010 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | - | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.3 | 0.2 | - | 0.1 | 0.1 |
| 2015 | 0.0 | 0.8 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.1 | 0.3 | - | 0.0 | 0.0 |
| 2020 | 0.1 | 0.1 | 0.0 | - | - | 0.0 | - | - | 0.2 | 0.0 | - | - | 1.2 | 0.1 | - | 0.0 | 0.0 |
| 2025 | 0.1 | 0.7 | 0.3 | 0.1 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | - | - | 3.1 | 0.5 | - | 0.1 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gilia inconspicua[a] (shy gilia) | Heterotheca villosa (hairy false goldenaster) | Lactuca serriola[ai] (prickly lettuce) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Mertensia lanceolata (prairie bluebells) | Microsteris gracilis[a] (slender phlox) | Packera multilobata (lobeleaf groundsel) | Penstemon humilis (low beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 1 | 6 | - | 8 | 11 | 72 | 3 | - | 5 | 0 | - | 4 | 45 | - | 34 | 5 | 7 |
| 2000 | 2 | 7 | - | 31 | 6 | 46 | 17 | - | - | 8 | - | - | 39 | - | 34 | - | 5 |
| 2005 | 1 | - | - | 3 | 7 | 60 | 9 | - | - | 3 | - | - | 29 | 17 | 24 | 4 | 7 |
| 2010 | - | 2 | - | 19 | 6 | 33 | 59 | - | - | 0 | 4 | 4 | 36 | - | - | 3 | 15 |
| 2015 | 9 | - | 26 | - | - | 66 | 39 | - | - | 1 | - | - | 25 | 1 | 7 | - | 15 |
| 2020 | 6 | - | - | - | 1 | 91 | - | - | - | 3 | - | - | 10 | - | 5 | - | 8 |
| 2025 | 2 | - | 31 | 11 | - | 127 | 24 | 1 | 2 | 3 | - | 2 | 57 | 4 | 14 | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | - | 0.0 | 0.1 | 3.3 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.5 | - | 0.1 | 0.0 | 0.2 |
| 2000 | 0.0 | 0.0 | - | 0.1 | 0.1 | 1.8 | 0.3 | - | - | 0.1 | - | - | 0.8 | - | 0.1 | - | 0.1 |
| 2005 | 0.0 | - | - | 0.1 | 0.1 | 4.4 | 0.3 | - | - | 0.2 | - | - | 1.2 | 0.2 | 0.1 | 0.0 | 0.1 |
| 2010 | - | 0.0 | - | 0.1 | 0.1 | 2.0 | 2.8 | - | - | 0.0 | 0.0 | 0.0 | 1.2 | - | - | 0.0 | 0.5 |
| 2015 | 0.2 | - | 0.2 | - | - | 4.1 | 1.8 | - | - | 0.0 | - | - | 0.6 | 0.0 | 0.0 | - | 0.1 |
| 2020 | 0.0 | - | - | - | 0.0 | 8.3 | - | - | - | 0.0 | - | - | 0.1 | - | 0.0 | - | 0.1 |
| 2025 | 0.0 | - | 0.1 | 0.2 | - | 8.4 | 0.8 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.6 | 0.0 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Petradoria pumila (rock goldenrod) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla (cinquefoil) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium longipes (longstalk clover) | Viola (violet) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | - | 82 | 78 | - | - | 14 | - | 16 | 39 | 3 | 64 | - | 2 |
| 2000 | 1 | 75 | 36 | - | - | 2 | - | 7 | 14 | 5 | 69 | 12 | - |
| 2005 | 2 | 82 | 26 | - | 3 | 25 | 8 | - | 0 | 2 | 32 | - | 1 |
| 2010 | 3 | 42 | 18 | - | - | 11 | 5 | - | 7 | 6 | 51 | - | 1 |
| 2015 | 2 | 42 | 5 | 5 | - | 25 | 1 | - | 35 | 10 | 61 | 44 | - |
| 2020 | 1 | 41 | 27 | 4 | - | 10 | 0 | - | 2 | 4 | 4 | 1 | - |
| 2025 | 1 | 111 | 67 | - | - | 16 | 7 | 7 | 3 | - | 65 | 9 | - |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | - | 0.4 | 0.2 | - | - | 0.1 | - | 0.1 | 0.3 | 0.0 | 0.1 | - | 0.0 |
| 2000 | 0.0 | 0.4 | 0.1 | - | - | 0.0 | - | 0.1 | 0.2 | 0.1 | 0.8 | 0.2 | - |
| 2005 | 0.1 | 0.7 | 0.1 | - | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.3 | - | 0.0 |
| 2010 | 0.1 | 0.2 | 0.0 | - | - | 0.1 | 0.1 | - | 0.0 | 0.0 | 0.5 | - | 0.0 |
| 2015 | 0.0 | 0.2 | 0.0 | 0.1 | - | 0.1 | 0.0 | - | 1.1 | 0.1 | 0.3 | 0.2 | - |
| 2020 | 0.0 | 0.5 | 0.1 | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | - |
| 2025 | 0.0 | 1.2 | 0.8 | - | - | 0.3 | 0.1 | 0.0 | 0.0 | - | 1.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08C-02.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum heracleoides (parsnipflower buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Mahonia repens (creeping barberry) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | 1.7 | 18 | 0.1 | 4.9 | - | 1.2 | 0.2 | 5.6 | 3 |
| 2010 | 2.1 | 17.7 | - | 1.2 | 0.1 | - | 0.5 | 7.9 | 3.7 |
| 2015 | 1.6 | 18.2 | - | 4.2 | 0.1 | - | 0.3 | 6.9 | 5 |
| 2020 | 2.1 | 18.5 | - | - | - | - | 0.5 | 6.2 | 3.9 |
| 2025 | 3 | 21.7 | 0.1 | - | - | - | - | 9.2 | 5.3 |
| year | Quadrat Cover (%) | | | | | | | | |
| 1995 | 0.3 | 13.4 | 0.4 | - | 0.2 | - | 0.5 | 3.1 | 0.7 |
| 2000 | 1.5 | 12.7 | 0.2 | - | - | - | 0.2 | 5.0 | 2.9 |
| 2005 | 1.5 | 14.5 | 0.4 | 0.0 | 0.0 | 0.0 | 0.3 | 6.2 | 3.3 |
| 2010 | 1.1 | 13.5 | 0.2 | 0.0 | 0.0 | - | 0.3 | 4.4 | 2.6 |
| 2015 | 1.1 | 14.0 | - | 0.0 | 0.0 | - | 0.2 | 4.4 | 1.6 |
| 2020 | 1.5 | 18.5 | 0.1 | - | - | - | 0.4 | 6.5 | 3.4 |
| 2025 | 1.5 | 21.1 | 0.0 | - | 0.0 | - | 0.2 | 7.8 | 3.9 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-02.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 80 | - | 0 | 75 | 25 | 50 | 25 | 0 | 51/110 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 75/127 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 100 | 0 | 88/134 |
| 2010 | 100 | - | 0 | 80 | 20 | 20 | 80 | 20 | 75/131 |
| 2015 | 80 | - | 0 | 50 | 50 | 0 | 100 | 50 | 75/115 |
| 2020 | 100 | - | 0 | 80 | 20 | 20 | 0 | 40 | 73/125 |
| 2025 | 120 | - | 17 | 67 | 17 | 67 | 17 | 17 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2480 | - | 0 | 67 | 33 | 52 | 27 | 14 | 55/106 |
| 2000 | 2500 | 220 | 7 | 57 | 36 | 12 | 2 | 18 | 58/91 |
| 2005 | 2160 | 760 | 7 | 68 | 26 | 28 | 4 | 17 | 60/98 |
| 2010 | 2400 | 20 | 15 | 64 | 21 | 37 | 23 | 22 | 62/110 |
| 2015 | 2560 | - | 5 | 73 | 23 | 43 | 36 | 28 | 50/85 |
| 2020 | 2740 | 80 | 20 | 60 | 20 | 18 | 14 | 31 | 63/109 |
| 2025 | 3540 | 140 | 20 | 65 | 15 | 17 | 0 | 24 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/53 |
| 2000 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/35 |
| 2005 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 27/41 |
| 2010 | 120 | - | 17 | 83 | 0 | 17 | 0 | 0 | 29/42 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/36 |
| 2020 | 140 | - | 0 | 100 | 0 | 14 | 0 | 0 | 31/46 |
| 2025 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | 3000 | - | 16 | 83 | 1 | 0 | 1 | 1 | 17/45 |
| 2000 | 2620 | - | 5 | 95 | 0 | 0 | 0 | 0 | 11/39 |
| 2005 | 2660 | - | 4 | 91 | 5 | 8 | 0 | 2 | 19/50 |
| 2010 | 1520 | - | 30 | 70 | 0 | 0 | 0 | 0 | 13/43 |
| 2015 | 3340 | - | 4 | 96 | 0 | 0 | 0 | 2 | 9/39 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/19 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/32 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/20 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/21 |
| 2020 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/20 |
| 2025 | 200 | - | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

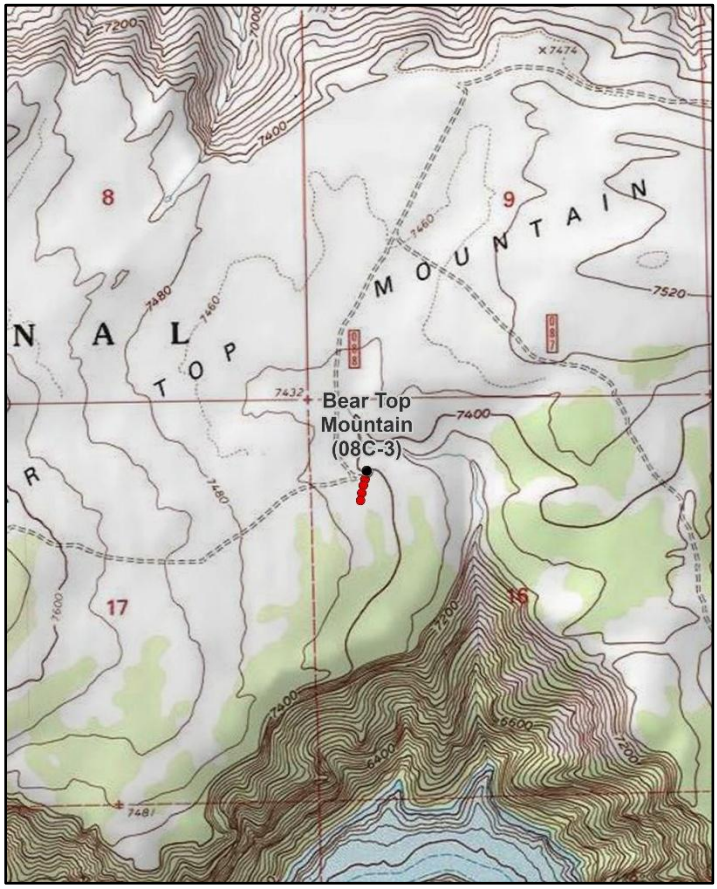
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 2900 | - | 35 | 66 | 0 | 0 | 0 | 0 | 9/18 |
| 2000 | 560 | - | 43 | 57 | 0 | 0 | 0 | 0 | 11/12 |
| 2005 | 400 | - | 40 | 60 | 0 | 0 | 0 | 0 | 11/16 |
| 2010 | 1080 | - | 15 | 85 | 0 | 0 | 0 | 0 | 11/16 |
| 2015 | 740 | - | 8 | 92 | 0 | 0 | 0 | 0 | 11/16 |
| 2020 | 1040 | - | 0 | 100 | 0 | 0 | 2 | 0 | 10/14 |
| 2025 | 1580 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 400 | - | 15 | 85 | 0 | 45 | 45 | 0 | 33/110 |
| 2000 | 420 | - | 10 | 81 | 10 | 67 | 0 | 5 | 50/158 |
| 2005 | 440 | - | 18 | 82 | 0 | 14 | 73 | 0 | 51/152 |
| 2010 | 480 | - | 4 | 96 | 0 | 29 | 54 | 4 | 54/149 |
| 2015 | 740 | - | 11 | 84 | 5 | 22 | 65 | 0 | 49/123 |
| 2020 | 880 | - | 7 | 89 | 5 | 21 | 64 | 2 | 49/125 |
| 2025 | 1060 | 80 | 4 | 96 | 0 | 43 | 36 | 0 | - / - |
| Ribes[p] -- (currant) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 80/94 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | 70/114 |
| 2020 | - | - | - | - | - | - | - | - | 66/74 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 400 | 20 | 35 | 65 | 0 | 0 | 0 | 0 | 37/108 |
| 2000 | 160 | - | 0 | 100 | 0 | 0 | 0 | 13 | 61/164 |
| 2005 | 320 | - | 6 | 94 | 0 | 0 | 0 | 0 | 43/98 |
| 2010 | 340 | - | 6 | 94 | 0 | 35 | 24 | 0 | 50/132 |
| 2015 | 600 | - | 3 | 87 | 10 | 27 | 0 | 20 | 43/101 |
| 2020 | 380 | - | 11 | 90 | 0 | 21 | 32 | 37 | 44/98 |
| 2025 | 700 | 120 | 0 | 100 | 0 | 69 | 0 | 0 | - / - |

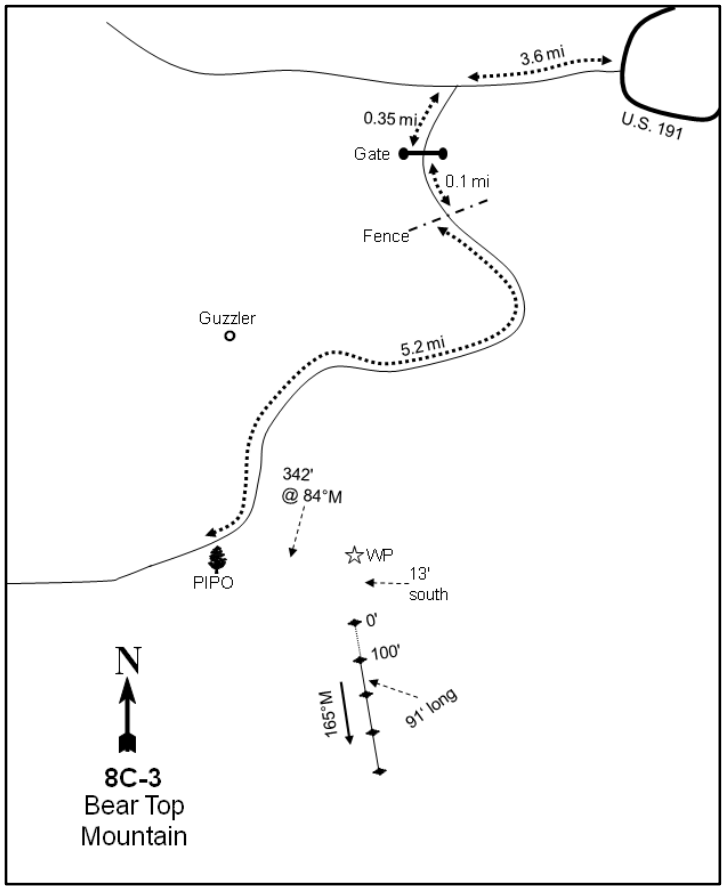
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-02.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 8 | 100 | - | - | - | - | 1.0 |
| 2025 | 4 | - | 100 | - | - | - | 1.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 8 | 100 | - | - | - | - | 1.0 |

# BEAR TOP MOUNTAIN - STUDY NO. 08C-3




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Flaming Gorge SW; Township 2N, Range 21E, Section 16 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 620899 East 4530310 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7095 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard; Line 2: 91ft Long |

## Directions to Site

From the intersection of State Route (SR) 260 and U.S. 191 northwest of Dutch John, proceed west towards Antelope Flat campground for 3.6 miles. Turn left and proceed on the dirt road towards Bear Top Mountain for 0.4 miles to a locked gate. Go through the gate and continue 0.1 miles to a new fence. Continue up the mountain approximately 5.2 miles to a large ponderosa pine (*Pinus ponderosa*). From the pine tree, the witness post is 342 feet away at 84 degrees magnetic. The 0-foot stake is 13 feet south of the witness post and is marked with red browse tag #7095.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | |
| Elevation | 7,400ft (2,256m) |
| Aspect | Northeast |
| Slope | 0-3% |
| Sample Dates | 08/16/1995, 07/07/2000, 07/26/2005, 08/04/2010, 06/24/2015, 07/21/2020, 07/09/2025 |

**Table 08C-03.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Prescribed | - | - | 1998 | - |

## Wildlife Habitat and Vegetation History

**Table 08C-03.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | substantial | winter |
| Rocky Mountain Elk | crucial | year-long |
| Greater Sage-Grouse | | |
| Pronghorn | crucial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 08C-03.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | No Encroachment |
| 1988 | Mountain Big Sagebrush | No Encroachment |
| 1995 | Mountain Big Sagebrush | No Encroachment |
| 2000 | Perennial Grass | No Encroachment |
| 2005 | Perennial Grass | No Encroachment |
| 2010 | Annual-Perennial Grass | Early Phase I |
| 2015 | Annual-Perennial Grass | Early Phase I |
| 2020 | Perennial Grass | Early Phase I |
| 2025 | Perennial Grass/Yellow Rabbitbrush-Mountain Big Sagebrush | Early Phase I |

## Site Notes

Rocky Mountain bighorn sheep were transplanted in the early 1980s and utilize the area as summer range. Two nearby guzzlers provide water for wildlife. Livestock have been excluded from the area since the early 1960s. The area was burned in 1998 as part of a prescribed fire to clear the rim of Bear Top Mountain for bighorn sheep habitat. However, the fire eliminated most of the shrubs. Antelope, mule deer, elk, bighorn sheep and sage-grouse have been observed in close proximity to the site during past readings.

## Soils

**Table 08C-03.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.8 | 65.4 | 19.7 | 14.9 | 2.2 | 4.5 | 201.6 | 0.9 | 07/07/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1982-1995 - Mountain Big Sagebrush/Introduced Non-Natives State: Community Phase 2.1<br>2000-2010 - Mountain Big Sagebrush/Introduced Non-Natives State: Community Phase 2.2<br>2015-2020 - Yellow Rabbitbrush State: Community Phase 4.1<br>2025 - State Undefined: Community Phase Undefined |

When the study was established in 1982, the plant community on this site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and remained as such through 1995 (Photos, Pre-1992 Data). Following a prescribed fire in 1998 (Table 08C-03.1), however, the site transitioned to one primarily composed of perennial grasses such as needle and thread (*Hesperostipa comata*) and Sandberg bluegrass (*Poa secunda*). The introduced annual grass species cheatgrass (*Bromus tectorum*) has fluctuated in cover following the fire and was co-dominant with perennial grasses in 2010 and 2015. Cheatgrass decreased in 2020 but was still present with significant abundance; both cover and frequency of cheatgrass were low in 2025. Forbs have generally provided low cover after the fire. The introduced and noxious annual forb nodding plumeless thistle (*Carduus nutans*) was observed in 2020 and 2025, but with low abundance (Table 08C-03.7, Table 08C-03.10, Table 08C-03.11). Sagebrush is re-establishing in the area, and density exhibited a notable increase between 2020 and 2025. During the most recent sample year (2025), mountain big sagebrush and yellow rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus* var. *viscidiflorus*) were co-dominant with perennial grasses (Photos, Table 08C-03.12, Table 08C-03.13).
Condition of mule deer winter range on this site has ranged between very poor and good since 1995; winter range condition was considered to be good in 2025. Negative factors contributing to this condition include reduced preferred browse cover; reduced

perennial forb cover; the amount of annual grass cover; and the presence of noxious weeds (Table 08C-03.6, Table 08C-03.7, Table 08C-03.11, Table 08C-03.15). Pellet transect data indicates that deer and elk presence has ranged between low and moderate over the sample period (Table 08C-03.9). During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Sagebrush plants have shown signs of decreasing utilization with decadence exhibiting a similar trend. Sagebrush density has increased which may explain these trends as forage has become more available. Other factors (climatic, etc.) combined with decreasing utilization have likely contributed to the overall decrease in decadence within the sagebrush population (Table 08C-03.13). On-site observations for 2025 note that little to no utilization was evident on herbaceous species.

## Trend Summary Tables

**Table 08C-03.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 17.1 | 0.8 | 0.1 | - | - | - |
| 2000 | 1.3 | 0.6 | - | - | - | - |
| 2005 | 0.8 | 0.8 | - | 0.5 | 0.6 | - |
| 2010 | 0.7 | 1.9 | - | 0.5 | 3.0 | - |
| 2015 | 2.4 | 3.5 | - | 1.6 | 4.5 | - |
| 2020 | 2.1 | 4.4 | 0.0 | 2.4 | 6.6 | - |
| 2025 | 9.3 | 7.8 | 0.1 | 8.6 | 9.5 | 0.9 |

**Table 08C-03.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 28 | 372 | 236 | 320 | 0.2 | 8.1 | 2.6 | 12.1 |
| 2000 | 62 | 361 | 121 | 240 | 0.7 | 13.5 | 0.4 | 6.8 |
| 2005 | 51 | 417 | 122 | 43 | 0.1 | 36.1 | 0.5 | 1.0 |
| 2010 | 272 | 332 | 154 | 84 | 16.2 | 24.4 | 1.1 | 2.6 |
| 2015 | 355 | 363 | 256 | 105 | 22.0 | 33.3 | 3.4 | 2.3 |
| 2020 | 279 | 374 | 243 | 62 | 10.1 | 29.0 | 1.8 | 1.5 |
| 2025 | 37 | 382 | 406 | 128 | 0.2 | 22.8 | 4.1 | 3.2 |

**Table 08C-03.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 16.7 | 3.2 | 46.0 | 0.0 | 11.0 | 38.0 |
| 2000 | 49.4 | 0.8 | 23.5 | 0.6 | 13.4 | 26.8 |
| 2005 | 16.5 | 0.2 | 37.8 | 0.0 | 11.3 | 41.9 |
| 2010 | 7.8 | 1.7 | 57.9 | - | 10.5 | 50.4 |
| 2015 | 8.1 | 1.6 | 56.6 | 0.1 | 10.9 | 61.2 |
| 2020 | 9.6 | 3.3 | 53.2 | 0.1 | 9.2 | 49.6 |
| 2025 | 15.9 | 2.7 | 44.4 | 0.1 | 10.4 | 47.2 |

**Table 08C-03.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer/Pronghorn/Big Horn Sheep | Rocky Mountain Elk | Greater Sage-Grouse | Yellow-bellied Marmot | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | | |
| 1995 | - | - | 16 | 7 | - | - | - | 3 |
| 2000 | - | - | 9 | 5 | 2 | - | 15 | 6 |
| 2005 | 1 | - | 6 | 14 | 2 | - | - | 26 |
| 2010 | - | - | 9 | 9 | 1 | - | - | 2 |
| 2015 | - | - | 3 | 4 | - | - | - | 13 |
| 2020 | - | - | 30 | 10 | 3 | 10 | - | 9 |
| 2025 | - | - | 9 | 10 | 1 | - | - | 17 |
| Year | Days Use Per Acre (ha) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | 26.2 (64.6)* | 24.1 (59.6) | 7.4 (18.2) | 8.7 (21.5)* | - | - | - |
| 2005 | - | - | 7.4 (18.2) | 28.8 (71.2) | 209.1 (516.4)* | - | - | - |
| 2010 | - | - | 26.8 (66.2) | 20.8 (51.3) | - | - | - | - |
| 2015 | - | - | 6.0 (14.9) | 4.0 (9.9) | 8.7 (21.5)* | - | - | - |
| 2020 | - | - | 10.0 (24.8) | 9.4 (23.2) | - | 34.9 (86.1)* | - | - |
| 2025 | - | - | 9.4 (23.2) | 16.8 (41.4) | - | 8.7 (21.5)* | - | - |

*Pellets per acre (ha)

**Table 08C-03.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | - | - | - | 28 | 18 | 44 | 129 | 92 | 13 | 144 | 115 | 89 | 8 | - |
| 2000 | - | 2 | 0 | 62 | 17 | 36 | 210 | 119 | 10 | 143 | 154 | 75 | - | - |
| 2005 | - | 23 | 9 | 51 | 9 | 66 | 200 | 193 | 31 | 92 | 148 | 52 | - | - |
| 2010 | 7 | 17 | 15 | 272 | 33 | 2 | 81 | 110 | 21 | 119 | 95 | 79 | - | - |
| 2015 | - | - | 32 | 355 | 40 | 9 | 216 | 128 | 13 | 29 | 132 | 62 | - | - |
| 2020 | 13 | 3 | 58 | 279 | 26 | 18 | 179 | 113 | 5 | 49 | 262 | 3 | - | - |
| 2025 | - | - | 93 | 37 | 20 | 7 | 78 | 118 | 7 | 58 | 305 | 9 | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | - | - | - | 0.2 | 0.2 | 0.5 | 1.0 | 1.5 | 0.1 | 2.5 | 1.3 | 1.0 | 0.2 | - |
| 2000 | - | 0.1 | 0.0 | 0.7 | 0.5 | 0.8 | 2.9 | 3.7 | 0.0 | 2.4 | 1.1 | 1.8 | - | - |
| 2005 | - | 1.1 | 0.5 | 0.1 | 0.4 | 1.7 | 3.4 | 15.9 | 1.5 | 4.0 | 4.3 | 3.4 | - | - |
| 2010 | 0.0 | 1.7 | 0.6 | 16.2 | 1.0 | 0.1 | 1.9 | 6.3 | 1.2 | 4.3 | 3.6 | 3.5 | - | - |
| 2015 | - | - | 2.6 | 22.0 | 1.7 | 0.3 | 10.2 | 9.9 | 0.2 | 1.1 | 3.8 | 3.4 | - | - |
| 2020 | 0.5 | 0.3 | 4.3 | 10.1 | 0.8 | 0.3 | 6.0 | 5.1 | 0.0 | 1.3 | 10.3 | 0.2 | - | - |
| 2025 | - | - | 4.5 | 0.2 | 1.0 | 0.2 | 1.1 | 4.7 | 0.2 | 1.0 | 9.8 | 0.4 | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08C-03.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabidopsis thaliana[ai] (mouseear cress) | Arabis holboellii[a] (Holboell's rockcress) | Arenaria congesta (ballhead sandwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Carduus nutans[ani] (nodding plumeless thistle) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 27 | 11 | 2 | - | - | 43 | - | 3 | 18 | - | 16 | 9 | 3 | - | - | 169 | 13 |
| 2000 | 66 | - | - | - | - | 32 | - | 2 | 4 | - | - | 11 | - | - | - | 108 | 14 |
| 2005 | - | - | - | - | - | 4 | - | 1 | 7 | 2 | 1 | - | - | - | - | 43 | - |
| 2010 | - | - | - | - | - | 24 | - | 4 | 6 | - | 6 | - | - | - | - | 51 | 3 |
| 2015 | 2 | - | - | - | - | 27 | - | 26 | 10 | - | 11 | - | 1 | - | 2 | 27 | - |
| 2020 | 1 | - | - | 1 | 11 | 3 | - | 3 | 5 | - | 5 | 0 | - | 2 | 3 | 231 | - |
| 2025 | - | 3 | - | - | 15 | 12 | 48 | 10 | 2 | - | 15 | - | - | 7 | - | 387 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.0 | 0.0 | - | - | 0.9 | - | 0.0 | 0.2 | - | 0.1 | 0.7 | 0.0 | - | - | 2.3 | 0.3 |
| 2000 | 0.5 | - | - | - | - | 0.3 | - | 0.0 | 0.1 | - | - | 0.7 | - | - | - | 0.3 | 0.1 |
| 2005 | - | - | - | - | - | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | 0.1 | - |
| 2010 | - | - | - | - | - | 0.9 | - | 0.0 | 0.1 | - | 0.1 | - | - | - | - | 0.2 | 0.0 |
| 2015 | 0.0 | - | - | - | - | 0.5 | - | 0.1 | 0.1 | - | 0.2 | - | 0.0 | - | 0.0 | 0.1 | - |
| 2020 | 0.0 | - | - | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.1 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 1.4 | - |
| 2025 | - | 0.0 | - | - | 0.5 | 0.3 | 0.1 | 0.0 | 0.1 | - | 0.2 | - | - | 0.0 | - | 2.8 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Crepis acuminata (tapertip hawksbeard) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Epilobium brachycarpum[a] (tall annual willowherb) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Heterotheca villosa (hairy false goldenaster) | Holosteum umbellatum[ai] (jagged chickweed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lithophragma tenellum (slender woodland-star) | Lithospermum ruderale (western stoneseed) | Lomatium triternatum (nineleaf biscuitroot) | Lupinus argenteus (silvery lupine) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 9 | 10 | - | 14 | - | 2 | 21 | 89 | 9 | 54 | - | 10 | 4 | - | 4 | - | 104 |
| 2000 | - | - | 1 | 1 | - | 5 | 6 | 32 | 8 | 21 | - | - | 6 | - | 8 | - | 98 |
| 2005 | - | - | 57 | 21 | - | - | - | 5 | 33 | - | - | - | 3 | - | - | - | 1 |
| 2010 | 1 | - | 1 | - | - | 3 | - | 8 | 27 | - | - | 4 | 2 | - | 2 | - | 2 |
| 2015 | - | - | 1 | 232 | 3 | 2 | - | 9 | 3 | 3 | - | - | 6 | - | - | - | 1 |
| 2020 | - | - | - | - | 2 | - | 2 | 20 | 1 | 4 | - | - | 1 | - | - | - | 3 |
| 2025 | - | - | 5 | 240 | - | - | - | 32 | - | 4 | 43 | - | 1 | 8 | - | 5 | 10 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.1 | - | 0.0 | - | 0.0 | 0.2 | 2.2 | 0.0 | 0.8 | - | 0.0 | 0.0 | - | 0.2 | - | 2.0 |
| 2000 | - | - | 0.0 | 0.0 | - | 0.1 | 0.0 | 1.5 | 0.0 | 0.2 | - | - | 0.0 | - | 0.0 | - | 1.9 |
| 2005 | - | - | 0.2 | 0.0 | - | - | - | 0.8 | 0.1 | - | - | - | 0.0 | - | - | - | 0.0 |
| 2010 | 0.0 | - | 0.0 | - | - | 0.0 | - | 1.0 | 0.1 | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 |
| 2015 | - | - | 0.0 | 3.2 | 0.0 | 0.0 | - | 0.8 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | 0.0 |
| 2020 | - | - | - | - | 0.1 | - | 0.0 | 1.1 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | 0.0 |
| 2025 | - | - | 0.0 | 0.5 | - | - | - | 0.8 | - | 0.8 | 0.1 | - | 0.0 | 0.0 | - | 0.0 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera canescens (hoary tansyaster) | Mertensia oblongifolia (oblongleaf bluebells) | Microsteris gracilis[a] (slender phlox) | Myosotis stricta[ai] (strict forget-me-not) | Oenothera pallida[a] (pale evening primrose) | Orthocarpus tolmiei[a] (Tolmie's owl's-clover) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox longifolia (longleaf phlox) | Phlox multiflora (flowery phlox) | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | 37 | - | 34 | 3 | 71 | - | 63 | 114 | - | - | 24 | 16 |
| 2000 | - | 1 | - | - | - | 8 | 1 | 18 | 8 | 32 | - | - | 25 | 6 | - | - | 7 |
| 2005 | - | - | - | - | - | - | - | - | 2 | - | - | 5 | 12 | - | 1 | 2 | 7 |
| 2010 | 5 | - | - | - | - | - | - | - | 1 | 3 | - | 96 | 1 | - | 8 | 9 | 22 |
| 2015 | 5 | - | 3 | - | - | - | 10 | 3 | - | 1 | 2 | 16 | 6 | - | 22 | 3 | 10 |
| 2020 | - | - | 6 | - | - | - | - | - | - | - | - | 17 | 9 | - | - | - | 3 |
| 2025 | - | 7 | 1 | 25 | 7 | 3 | - | - | - | 4 | - | 103 | 6 | 1 | - | 2 | 24 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | 0.2 | - | 1.4 | 0.0 | 2.3 | - | 0.1 | 0.4 | - | - | 0.1 | 0.0 |
| 2000 | - | 0.0 | - | - | - | 0.0 | 0.0 | 0.9 | 0.0 | 0.3 | - | - | 0.1 | 0.0 | - | - | 0.0 |
| 2005 | - | - | - | - | - | - | - | - | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 |
| 2010 | 0.0 | - | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.9 | 0.0 | - | 0.1 | 0.1 | 0.1 |
| 2015 | 0.0 | - | 0.0 | - | - | - | 0.2 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.1 |
| 2020 | - | - | 0.0 | - | - | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 |
| 2025 | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - | - | - | 0.1 | - | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Verbascum thapsus[ai] (common mullein) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|
| year | Nested | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | - | - |
| 2010 | - | - |
| 2015 | - | 3 |
| 2020 | 3 | - |
| 2025 | 4 | 4 |
| year | Average Cover (%) | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | - | - |
| 2010 | - | - |
| 2015 | - | 0.0 |
| 2020 | 0.1 | - |
| 2025 | 0.1 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08C-03.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Ceanothus fendleri (Fendler's ceanothus) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Pediocactus simpsonii (mountain ball cactus) | Purshia tridentata[p] (antelope bitterbrush) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 0.4 | - | 0.3 | 0.2 | - | - | 0.1 | 0.1 |
| 2010 | 0.3 | - | 1.4 | 1 | - | 0 | 0.2 | 0.6 |
| 2015 | 1.5 | - | 2.3 | 1.6 | - | 0.1 | 0.1 | 0.5 |
| 2020 | 1.9 | - | 4.3 | 0.8 | - | 0.1 | 0.5 | 1.4 |
| 2025 | 7.9 | - | 7.6 | 0.2 | 0.9 | - | 0.7 | 1.7 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | 14.5 | - | 0.8 | - | 0.1 | 0.0 | 2.6 | 0.0 |
| 2000 | 1.3 | 0.2 | 0.2 | 0.2 | - | 0.0 | 0.0 | 0.0 |
| 2005 | 0.8 | - | 0.1 | 0.4 | - | - | 0.0 | 0.3 |
| 2010 | 0.7 | 0.0 | 0.8 | 0.5 | - | 0.0 | 0.0 | 0.6 |
| 2015 | 2.4 | 0.0 | 1.6 | 1.1 | - | 0.0 | 0.0 | 0.7 |
| 2020 | 2.1 | - | 3.0 | 0.2 | 0.0 | 0.0 | 0.0 | 1.1 |
| 2025 | 9.3 | 0.1 | 6.4 | 0.1 | 0.1 | 0.0 | 0.0 | 1.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-03.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 32/54 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 23/21 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/31 |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 20/30 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 5200 | 40 | 12 | 77 | 11 | 34 | 60 | 4 | 37/74 |
| 2000 | 320 | 20 | 0 | 56 | 44 | 38 | 0 | 31 | 31/74 |
| 2005 | 240 | 140 | 33 | 33 | 33 | 17 | 50 | 8 | 31/69 |
| 2010 | 440 | - | 32 | 46 | 23 | 9 | 55 | 23 | 34/65 |
| 2015 | 620 | - | 10 | 84 | 7 | 23 | 3 | 0 | 32/71 |
| 2020 | 880 | 40 | 25 | 59 | 16 | 21 | 14 | 16 | 41/77 |
| 2025 | 13240 | 22300 | 67 | 33 | 0 | 2 | 0 | 4 | - / - |
| Ceanothus fendleri -- (Fendler's ceanothus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/45 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/45 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 19/72 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/42 |
| 2020 | - | - | - | - | - | - | - | - | 21/75 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 940 | - | 4 | 94 | 2 | 0 | 0 | 0 | 24/36 |
| 2000 | 880 | - | 34 | 66 | 0 | 0 | 0 | 0 | 9/14 |
| 2005 | 360 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/37 |
| 2010 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 34/63 |
| 2015 | 1240 | 20 | 34 | 66 | 0 | 7 | 0 | 0 | 31/61 |
| 2020 | 2180 | - | 5 | 94 | 2 | 0 | 0 | 2 | 32/64 |
| 2025 | 6160 | 3300 | 63 | 33 | 4 | 0 | 0 | 4 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 10/10 |
| 2000 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/34 |
| 2005 | 1080 | - | 61 | 37 | 2 | 0 | 0 | 0 | 17/29 |
| 2010 | 860 | 220 | 28 | 61 | 12 | 0 | 0 | 12 | 19/34 |
| 2015 | 1200 | 40 | 12 | 88 | 0 | 0 | 0 | 0 | 18/28 |
| 2020 | 580 | 40 | 10 | 90 | 0 | 0 | 0 | 0 | 16/24 |
| 2025 | 1180 | 20 | 68 | 32 | 0 | 0 | 0 | 0 | - / - |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 220 | - | 9 | 91 | 0 | 0 | 0 | 0 | 5/8 |
| 2000 | 160 | 20 | 25 | 63 | 13 | 0 | 0 | 13 | 6/46 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/7 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/10 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/14 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 120 | - | 0 | 100 | 0 | 33 | 50 | 0 | 53/184 |
| 2000 | 20 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 9/24 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 24/68 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 41/118 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/119 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 39/184 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 120 | - | 0 | 83 | 17 | 0 | 0 | 0 | 25/34 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 20/41 |
| 2010 | 120 | - | 0 | 100 | 0 | 83 | 0 | 0 | 28/51 |
| 2015 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 33/70 |
| 2020 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 37/65 |
| 2025 | 140 | - | 0 | 86 | 14 | 57 | 0 | 14 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

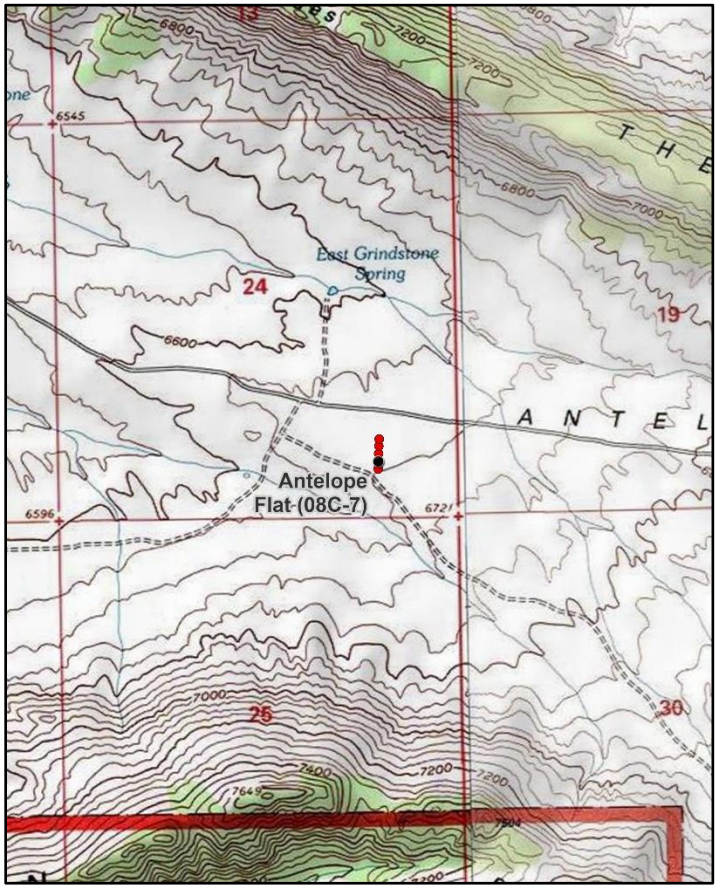
**Table 08C-03.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

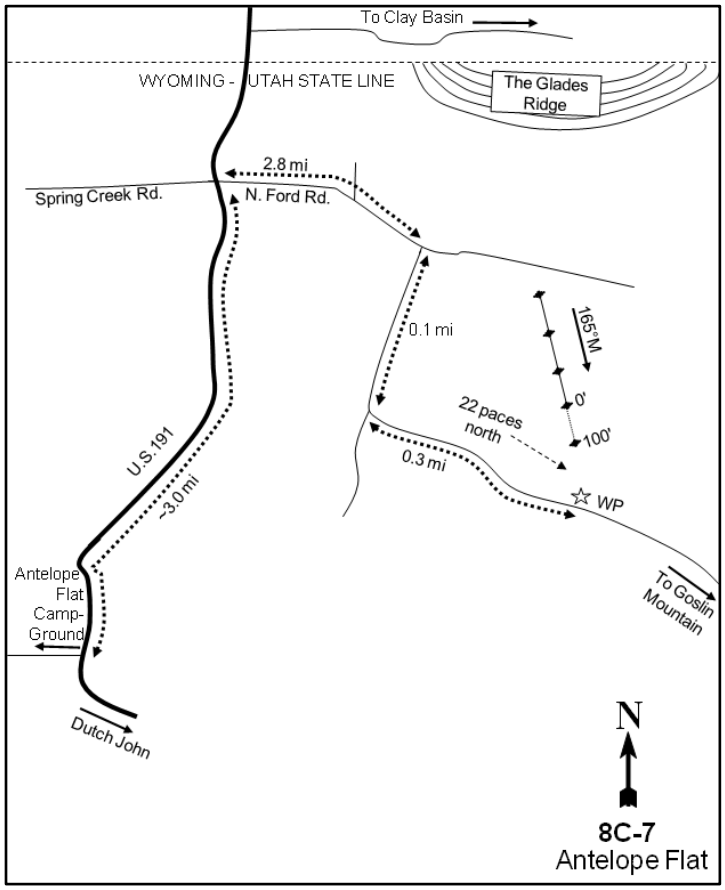
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 4 | - | 50 | 50 | - | - | 10.5 |
| 2025 | 5 | - | 50 | 50 | - | - | 4.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2025 | 1 | - | 100 | - | - | - | 2.0 |

**Table 08C-03.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 22.0 | 12.3 | 5.2 | 16.3 | -0.2 | 10.0 | 0.0 | **65.6** | Fair |
| 2000 | 1.6 | 0.0 | 0.0 | 27.0 | -0.5 | 10.0 | 0.0 | **38.1** | Very Poor-Poor |
| 2005 | 0.7 | 0.0 | 0.0 | 30.0 | -0.1 | 2.1 | 0.0 | **32.7** | Very Poor |
| 2010 | 0.7 | 0.0 | 0.0 | 30.0 | -12.2 | 5.1 | 0.0 | **23.6** | Very Poor |
| 2015 | 2.0 | 0.0 | 0.0 | 30.0 | -16.5 | 4.5 | 0.0 | **20.0** | Very Poor |
| 2020 | 3.1 | 0.0 | 0.0 | 30.0 | -7.6 | 3.1 | -2.0 | **26.6** | Very Poor |
| 2025 | 10.9 | 14.9 | 15.0 | 30.0 | -0.2 | 6.4 | -2.0 | **75.0** | Good |

# ANTELOPE FLAT - STUDY NO. 08C-7




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Dutch John NE; Township 3N, Range 22E, Section 24 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 636313 East 4537522 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 153 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 2: 1ft |

## Directions to Site

From Dutch John, proceed north toward Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before reaching the Wyoming-Utah border, turn east on the Antelope Flat Road towards Goslin Mountain, then go 2.8 miles and turn right towards Goslin Mountain. Go 0.1 miles to a fork. Bear left on the main fork toward the mountain and proceed 0.3 miles to a witness post on the north side of the road. Walk approximately 100 feet (22 paces) from the witness post north into the sagebrush to the 100-foot end of the baseline. The 0-foot end of the frequency baseline is 100 feet north and is marked with browse tag #153.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | GOSLIN MOUNTAIN |
| Elevation | 6,650ft (2,027m) |
| Aspect | Northwest |
| Slope | 2-3% |
| Sample Dates | 08/17/1995, 07/06/2000, 07/13/2005, 08/04/2010, 06/24/2015, 07/20/2020, 07/16/2025 |

**Table 08C-07.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Goslin Mountain P/J Encroachment Removal | 297 | August 2006 | 1677 |

## Wildlife Habitat and Vegetation History

**Table 08C-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | substantial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | crucial | year-long |

**Table 08C-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Wyoming Big Sagebrush | No Encroachment |
| 1995 | Wyoming Big Sagebrush | No Encroachment |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush | Early Phase I |
| 2010 | Wyoming Big Sagebrush | No Encroachment |
| 2015 | Wyoming Big Sagebrush/Annual Grass | No Encroachment |
| 2020 | Wyoming Big Sagebrush | No Encroachment |
| 2025 | Wyoming Big Sagebrush | No Encroachment |

## Site Notes

Deer and antelope can be found in the valley year round, while elk from Goslin Mountain also utilize the lower valleys as winter range. Due to difficulties in differentiating between species, deer and antelope pellets were all classified as a combined group.

## Soils

**Table 08C-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.0 | 65.4 | 17.0 | 17.6 | 1.7 | 4.9 | 118.4 | 0.8 | 07/06/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R047XB222UT |
| States and Transitions | 1988-2000 - Current Potential State: Community Phase 2.1<br>2010-2020 - Sagebrush With Depleted Understory State: Community Phase 6.1<br>2025 - Current Potential State: Community Phase 2.1 |

Since study establishment in 1988, the plant community on this site has remained in a generally stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) as the dominant vegetation component. Other shrub species have been observed on the transect over the study period, but preferred browse species other than sagebrush have remained rare (Pre-1992 Data, Table 08C-07.12, Table 08C-07.13). Utah juniper (*Juniperus osteosperma*) was present in the area in 2000 and 2005, placing the site in Early Phase I of woodland succession. However, any trees present were removed by a 2006 lop and scatter treatment, and there has been no encroachment since 2010 (Photos, Table 08C-07.1, Table 08C-07.4). The herbaceous understory has remained diverse and has provided good cover throughout the sample period. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been present on this site and has exhibited an overall increase; cheatgrass was considered to be a co-dominant vegetation component in 2015. Although annual grasses have decreased since 2015, they could pose a threat to the plant community's ecological resilience should they increase again in the future (Table 08C-07.7, Table 08C-07.10, Table 08C-07.11).

Condition of mule deer winter range on this site has ranged between poor-fair and good since 1995; winter range condition was considered to be fair in 2025. Negative factors contributing to this fair condition include the lack of recruitment to the preferred browse community; reduced perennial grass and forb cover; and the amount of annual grass cover (Table 08C-07.7, Table 08C-07.13, Table 08C-07.15). Pellet transect data indicates that deer/antelope presence has been low for most years sampled; however, deer/antelope presence was high in 2020. Elk presence was moderate in 2000, but it has since remained low. Cattle presence has been moderate in most sample years. Sagebrush plants have shown signs of increasing utilization with decadence showing a similar, yet less pronounced trend (Table 08C-07.9, Table 08C-07.13). On-site observations for 2025 note that little to no utilization was evidenton herbaceous species. Additional observations in 2025 mention that the area may be affected by drought as made evident by stunted primary growth and restricted flowering on all vegetation life forms.

## Trend Summary Tables

**Table 08C-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 16.0 | 5.5 | - | - | - | - |
| 2000 | 19.4 | 7.0 | - | - | - | - |
| 2005 | 22.3 | 6.4 | - | 21.9 | 4.9 | - |
| 2010 | 20.0 | 5.1 | - | 24.0 | 5.6 | - |
| 2015 | 23.0 | 4.4 | - | 22.4 | 4.2 | - |
| 2020 | 24.3 | 7.2 | - | 26.9 | 6.8 | - |
| 2025 | 23.9 | 6.1 | - | 24.4 | 3.9 | - |

**Table 08C-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 76 | 363 | 313 | 249 | 0.5 | 5.7 | 6.9 | 2.8 |
| 2000 | 139 | 369 | 131 | 256 | 2.8 | 9.6 | 0.5 | 5.4 |
| 2005 | 166 | 352 | 156 | 204 | 0.9 | 11.9 | 1.0 | 2.7 |
| 2010 | 330 | 312 | 34 | 119 | 10.0 | 8.6 | 0.1 | 2.0 |
| 2015 | 400 | 271 | 236 | 177 | 23.4 | 7.3 | 6.6 | 2.8 |
| 2020 | 350 | 255 | 202 | 174 | 11.0 | 5.1 | 1.4 | 3.2 |
| 2025 | 289 | 263 | 395 | 262 | 4.2 | 9.0 | 6.3 | 4.9 |

**Table 08C-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 26.2 | 7.7 | 42.2 | 0.6 | 0.2 | 36.5 |
| 2000 | 35.5 | 5.1 | 46.5 | 0.4 | 0.0 | 46.6 |
| 2005 | 41.8 | 5.3 | 26.3 | 0.9 | 0.1 | 37.6 |
| 2010 | 27.3 | 3.7 | 39.2 | 0.9 | 0.1 | 44.0 |
| 2015 | 20.9 | 6.5 | 48.9 | 0.3 | 0.0 | 48.6 |
| 2020 | 27.4 | 12.2 | 41.9 | 1.0 | 0.0 | 46.2 |
| 2025 | 27.2 | 9.8 | 36.8 | 0.9 | 0.4 | 48.5 |

**Table 08C-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer/Pronghorn | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 1 | 38 | 5 | - | 8 |
| 2000 | 1 | 1 | 5 | - | 4 |
| 2005 | 6 | 11 | 8 | - | 55 |
| 2010 | 1 | 2 | - | 2 | 3 |
| 2015 | 1 | 7 | - | 3 | 66 |
| 2020 | 2 | 25 | 3 | 1 | 28 |
| 2025 | 1 | 7 | 3 | 3 | 4 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 10.2 (25.1) | 7.4 (18.2) | 22.1 (54.6) | 26.2 (64.6)* | - |
| 2005 | 16.0 (39.5) | 8.1 (19.9) | 8.7 (21.5) | 8.7 (21.5)* | - |
| 2010 | 14.5 (35.9) | 12.8 (31.5) | 4.0 (9.9) | - | - |
| 2015 | 4.4 (10.8) | 12.8 (31.5) | 1.3 (3.3) | 278.8 (688.6)* | - |
| 2020 | 10.9 (26.9) | 84.5 (208.6) | - | 26.2 (64.6)* | - |
| 2025 | 7.2 (17.9) | 9.4 (23.2) | 6.7 (16.6) | 26.2 (64.6)* | - |

*Pellets per acre (ha)

**Table 08C-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 21 | 75 | - | 35 | 211 | 35 | - | - | 35 | 183 | 123 | 1 |
| 2000 | 13 | 139 | 3 | 38 | 178 | 6 | 40 | - | 127 | 195 | 23 | 3 |
| 2005 | 14 | 160 | - | 45 | 225 | 24 | 7 | - | 80 | 183 | 37 | 10 |
| 2010 | 7 | 330 | - | 11 | 183 | 35 | 1 | - | 9 | 242 | - | - |
| 2015 | 2 | 400 | 1 | 30 | 91 | 68 | 14 | - | - | 165 | 26 | 10 |
| 2020 | 30 | 348 | 2 | 30 | 80 | 106 | 5 | - | 7 | 106 | 4 | 9 |
| 2025 | 5 | 287 | 3 | 47 | 87 | 70 | 10 | 2 | 19 | 132 | 25 | 6 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.2 | 0.5 | - | 0.3 | 0.8 | 0.3 | - | - | 0.4 | 3.0 | 0.6 | 0.0 |
| 2000 | 0.3 | 2.7 | 0.0 | 1.1 | 2.5 | 0.0 | 0.6 | - | 2.9 | 1.9 | 0.3 | 0.0 |
| 2005 | 0.3 | 0.8 | - | 0.7 | 2.6 | 0.7 | 0.2 | - | 2.3 | 4.5 | 0.6 | 0.0 |
| 2010 | 0.0 | 10.0 | - | 0.1 | 2.2 | 0.7 | 0.0 | - | 0.1 | 5.5 | - | - |
| 2015 | 0.0 | 23.4 | 0.0 | 0.5 | 0.3 | 1.5 | 0.4 | - | - | 3.5 | 1.0 | 0.0 |
| 2020 | 0.1 | 11.0 | 0.0 | 0.4 | 0.8 | 1.9 | 0.1 | - | 0.1 | 1.7 | 0.1 | 0.0 |
| 2025 | 0.2 | 4.2 | 0.0 | 1.2 | 0.8 | 1.8 | 0.4 | 0.0 | 0.4 | 3.1 | 1.0 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08C-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Antennaria dimorpha (low pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Cordylanthus ramosus[a] (bushy bird's beak) | Crepis acuminata (tapertip hawksbeard) | Cymopterus longipes (longstalk springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 24 | 11 | - | 1 | 10 | 23 | - | - | 61 | - | 203 | 4 | 16 | 3 | - | 19 | - |
| 2000 | 1 | - | - | 30 | 8 | 30 | 3 | - | 27 | - | 62 | - | 41 | - | - | 49 | 3 |
| 2005 | 6 | - | - | 2 | 2 | 29 | 37 | 1 | 75 | - | 16 | - | 39 | - | - | 11 | 1 |
| 2010 | - | 1 | - | - | 2 | 13 | - | - | 1 | - | - | - | 10 | - | - | 8 | 12 |
| 2015 | - | - | 228 | 3 | 5 | 9 | - | - | - | - | - | - | 1 | 1 | 7 | 6 | - |
| 2020 | - | - | 185 | 2 | - | 6 | 4 | - | 46 | 10 | - | - | 7 | - | - | 2 | 15 |
| 2025 | 11 | - | 388 | 6 | 3 | 22 | 56 | - | 124 | 3 | 3 | 1 | 20 | 5 | - | 11 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.3 | - | - | 0.3 | - | 6.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | - |
| 2000 | 0.0 | - | - | 0.5 | 0.0 | 0.3 | 0.0 | - | 0.1 | - | 0.3 | - | 0.3 | - | - | 0.5 | 0.0 |
| 2005 | 0.0 | - | - | 0.0 | 0.0 | 0.5 | 0.1 | 0.0 | 0.3 | - | 0.3 | - | 0.1 | - | - | 0.1 | 0.0 |
| 2010 | - | 0.0 | - | - | 0.0 | 0.3 | - | - | 0.0 | - | - | - | 0.0 | - | - | 0.1 | 0.2 |
| 2015 | - | - | 6.5 | 0.0 | 0.0 | 0.1 | - | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - |
| 2020 | - | - | 1.1 | 0.0 | - | 0.0 | 0.0 | - | 0.3 | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.1 |
| 2025 | 0.1 | - | 5.5 | 0.2 | 0.0 | 0.5 | 0.1 | - | 0.6 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gilia inconspicua[a] (shy gilia) | Lepidium[a] (pepperweed) | Machaeranthera canescens (hoary tansyaster) | Microsteris gracilis[a] (slender phlox) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Trifolium gymnocarpon (hollyleaf clover) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1995 | 20 | 11 | 4 | 5 | 135 | - | 57 | 101 | 100 | - | 47 | 14 | 29 | 58 | - |
| 2000 | - | 1 | - | - | 43 | - | 24 | 101 | 87 | - | 8 | 5 | 27 | 81 | - |
| 2005 | 2 | 2 | - | - | 111 | - | 18 | 43 | 46 | - | - | 1 | 31 | 83 | 0 |
| 2010 | 2 | - | 25 | - | 5 | - | 2 | 50 | 3 | - | - | - | 28 | 19 | - |
| 2015 | - | - | - | - | - | 3 | 24 | 60 | 51 | 13 | - | 2 | 38 | 49 | - |
| 2020 | - | - | - | 1 | 11 | - | 25 | 57 | 108 | 1 | - | - | 46 | - | - |
| 2025 | - | - | - | - | 11 | - | 35 | 63 | 154 | - | 2 | 12 | 51 | 40 | 0 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | - | 0.5 | 1.2 | 0.2 | - | 0.1 | 0.0 | 0.2 | 0.1 | - |
| 2000 | - | 0.0 | - | - | 0.1 | - | 0.1 | 2.4 | 0.3 | - | 0.0 | 0.0 | 0.3 | 0.5 | - |
| 2005 | 0.0 | 0.0 | - | - | 0.4 | - | 0.3 | 0.6 | 0.1 | - | - | 0.0 | 0.4 | 0.5 | 0.0 |
| 2010 | 0.0 | - | 0.1 | - | 0.0 | - | 0.1 | 1.0 | 0.0 | - | - | - | 0.3 | 0.0 | - |
| 2015 | - | - | - | - | - | 0.0 | 0.8 | 0.6 | 0.2 | 0.5 | - | 0.0 | 0.4 | 0.2 | - |
| 2020 | - | - | - | 0.0 | 0.0 | - | 0.5 | 1.3 | 0.9 | 0.0 | - | - | 0.3 | - | - |
| 2025 | - | - | - | - | 0.0 | - | 0.6 | 1.8 | 0.8 | - | 0.0 | 0.0 | 0.5 | 0.2 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08C-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2005 | 21.9 | 4.6 | - | - | 0.1 | - | 0.2 |
| 2010 | 24 | 5.2 | - | 0 | 0.2 | - | 0.2 |
| 2015 | 22.4 | 3.4 | - | - | 0.1 | - | 0.7 |
| 2020 | 26.9 | 6 | - | - | 0.1 | - | 0.7 |
| 2025 | 24.4 | 3.3 | - | - | - | - | 0.6 |
| year | Quadrat Cover (%) | | | | | | |
| 1995 | 16.0 | 5.2 | - | 0.0 | - | - | 0.4 |
| 2000 | 19.4 | 6.0 | - | 0.0 | 0.1 | - | 0.8 |
| 2005 | 22.2 | 5.9 | - | 0.0 | 0.0 | - | 0.5 |
| 2010 | 20.0 | 4.6 | - | 0.0 | 0.1 | - | 0.5 |
| 2015 | 23.0 | 3.6 | - | 0.0 | 0.2 | - | 0.6 |
| 2020 | 24.3 | 5.6 | 0.6 | 0.0 | 0.2 | 0.0 | 0.7 |
| 2025 | 23.8 | 5.1 | - | 0.1 | 0.0 | - | 1.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 5620 | 60 | 10 | 68 | 22 | 54 | 35 | 7 | 45/80 |
| 2000 | 5820 | 20 | 8 | 46 | 46 | 22 | 4 | 20 | 49/78 |
| 2005 | 5000 | 7100 | 8 | 66 | 26 | 5 | 1 | 16 | 51/73 |
| 2010 | 5500 | 560 | 29 | 44 | 27 | 31 | 1 | 40 | 50/79 |
| 2015 | 7720 | - | 20 | 56 | 24 | 19 | 37 | 23 | 43/71 |
| 2020 | 7460 | 160 | 26 | 44 | 30 | 28 | 15 | 33 | 50/69 |
| 2025 | 7140 | - | 4 | 52 | 45 | 16 | 78 | 56 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 5840 | 60 | 12 | 87 | 1 | 2 | 0 | 1 | 26/40 |
| 2000 | 6000 | - | 5 | 82 | 13 | 0 | 0 | 9 | 25/40 |
| 2005 | 4700 | - | 3 | 85 | 12 | 0 | 0 | 3 | 22/33 |
| 2010 | 4260 | - | 9 | 76 | 16 | 0 | 0 | 16 | 30/40 |
| 2015 | 4680 | 20 | 8 | 92 | 0 | 18 | 6 | 2 | 21/27 |
| 2020 | 4740 | - | 4 | 83 | 13 | 5 | 12 | 22 | 22/33 |
| 2025 | 3700 | - | 3 | 85 | 12 | 7 | 0 | 18 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 60 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 14/21 |
| 2000 | 80 | - | 75 | 25 | 0 | 0 | 0 | 0 | 14/11 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/13 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/14 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/17 |
| 2020 | - | - | - | - | - | - | - | - | 8/24 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 56/77 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 45/64 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 33/50 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/33 |
| 2000 | 480 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/18 |
| 2005 | 180 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 17/16 |
| 2010 | 560 | - | 7 | 86 | 7 | 0 | 0 | 7 | 22/25 |
| 2015 | 320 | - | 0 | 100 | 0 | 6 | 0 | 6 | 19/19 |
| 2020 | 360 | - | 11 | 89 | 0 | 0 | 0 | 0 | 18/21 |
| 2025 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 8/19 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

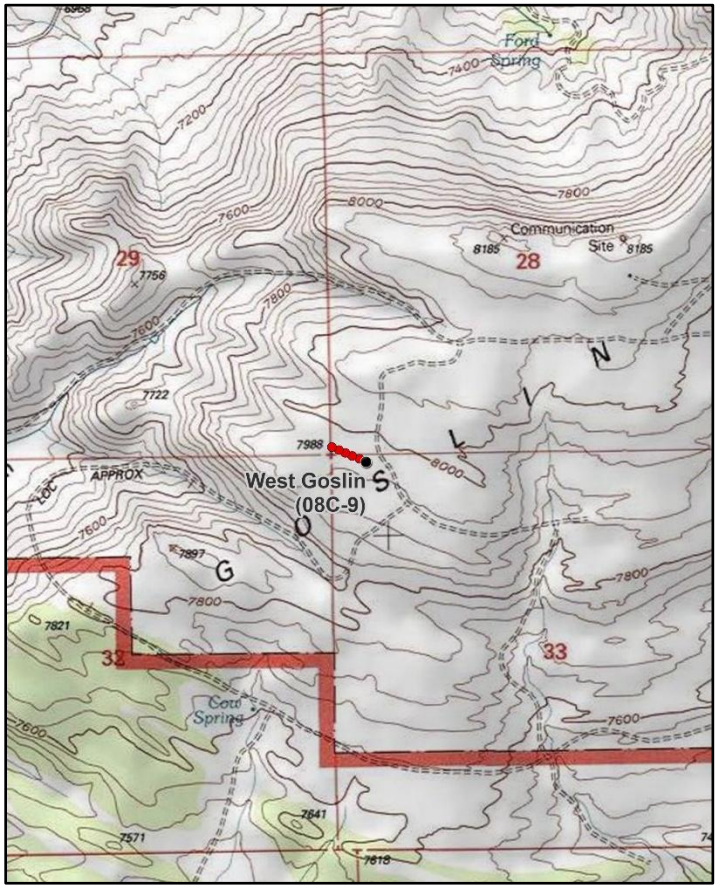
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 14/33 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/8 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 560 | - | 4 | 96 | 0 | 0 | 0 | 0 | 9/30 |
| 2000 | 520 | 20 | 4 | 85 | 12 | 0 | 0 | 12 | 11/25 |
| 2005 | 620 | - | 0 | 84 | 16 | 0 | 0 | 0 | 12/33 |
| 2010 | 500 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/35 |
| 2015 | 740 | - | 3 | 97 | 0 | 0 | 0 | 0 | 13/36 |
| 2020 | 660 | - | 3 | 97 | 0 | 0 | 0 | 0 | 12/34 |
| 2025 | 1300 | 20 | 2 | 91 | 8 | 3 | 0 | 12 | - / - |

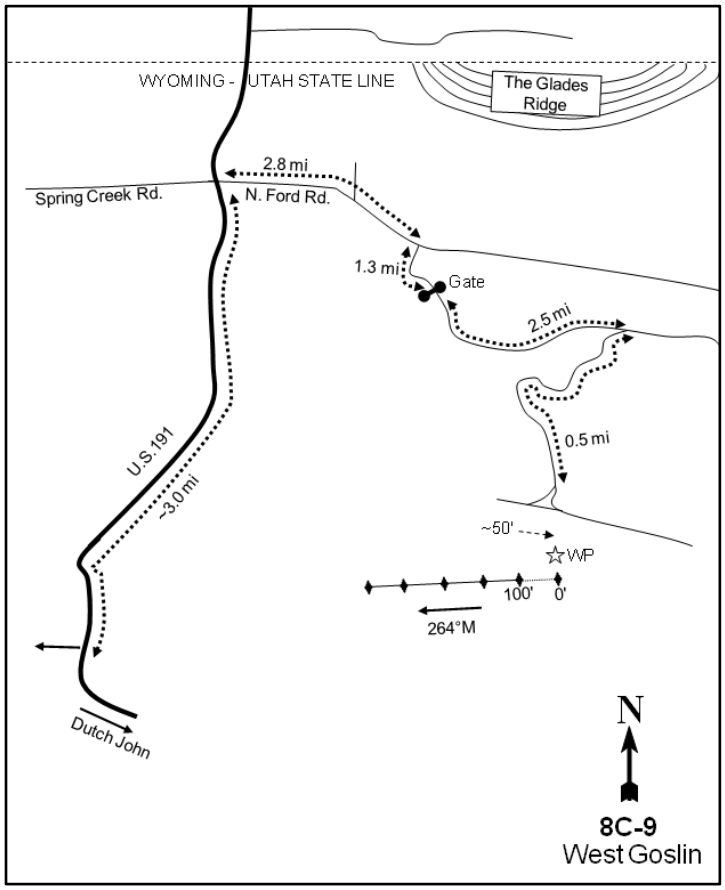
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-07.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 20.0 | 8.5 | 5.2 | 11.3 | -0.4 | 5.5 | 0.0 | **50.1** | Good |
| 2000 | 24.3 | 1.2 | 3.9 | 19.3 | -2.1 | 10.0 | 0.0 | **56.6** | Good |
| 2005 | 27.4 | 7.3 | 4.0 | 23.9 | -0.6 | 5.4 | 0.0 | **67.4** | Excellent |
| 2010 | 30.0 | 6.8 | 14.6 | 17.2 | -7.5 | 3.9 | 0.0 | **65.0** | Good-Excellent |
| 2015 | 28.0 | 7.8 | 10.1 | 14.6 | -17.5 | 5.5 | 0.0 | **48.5** | Good |
| 2020 | 30.0 | 6.0 | 13.0 | 10.1 | -8.3 | 6.3 | 0.0 | **57.1** | Good |
| 2025 | 30.0 | 1.6 | 1.8 | 18.0 | -3.1 | 9.8 | 0.0 | **58.1** | Good |

# WEST GOSLIN - STUDY NO. 08C-9




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Goslin Mountain NW; Township 3N, Range 23E, Section 33 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 640111 East 4535748 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 34 |
| Transect Bearing | 284° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before reaching the Wyoming-Utah border, turn east on the Antelope Flat Road and go towards Goslin Mountain. Travel 2.8 miles and turn right toward Goslin Mountain. Turn right and drive 1.3 miles to a gate. Go through the gate and continue 2.5 miles to a fork. Proceed to the right and continue for 0.5 miles to an intersection. The witness post is located on the east side of the "Y" shaped intersection about 50 feet south of the road. Full-sized posts are used to mark the site. The 0-foot post is marked with browse tag #34.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | GOSLIN MOUNTAIN |
| Elevation | 7,986ft (2,434m) |
| Aspect | Southwest |
| Slope | 2-4% |
| Sample Dates | 07/10/1995, 07/05/2000, 07/28/2005, 08/09/2010, 06/24/2015, 07/21/2020, 07/22/2025 |

**Table 08C-09.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Mustang | - | 2002 | 21638 |

## Wildlife Habitat and Vegetation History

**Table 08C-09.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | crucial | summer |

**Table 08C-09.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Perennial Grass-Forb | No Encroachment |
| 2010 | Perennial Grass | No Encroachment |
| 2015 | Perennial Grass/Mountain Big Sagebrush | No Encroachment |
| 2020 | Mountain Big Sagebrush | No Encroachment |
| 2025 | Mountain Big Sagebrush | No Encroachment |

## Site Notes

The site was burned in 2002 as part of the Mustang fire which burned the west face of Goslin Mountain, but did not extend to the east side of the mountain where the Goslin Mountain site (08C-02) is located. In addition, the site was seeded following either the fire or when a pipeline was put in that runs through the 0-100-foot portion of the transect. Deer, elk, and antelope use the area, and elk and antelope have been seen using the site during multiple readings. Due to difficulties in differentiating between species, deer and antelope pellets were all classified together.

## Soils

**Table 08C-09.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.1 | 64.0 | 21.4 | 14.6 | 3.0 | 4.7 | 134.4 | 0.6 | 07/05/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1995-2000 - Mountain Big Sagebrush Super-Dominance State: Community Phase 3.1<br>2005-2010 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.2<br>2015 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1<br>2020-2025 - Mountain Big Sagebrush Super-Dominance State: Community Phase 3.1 |

When the study was established in 1995, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) was the dominant vegetation component (Photos, Table 08C-09.12). A 2002 fire (Table 08C-09.1) removed most of the shrubs, causing the site to transition to a community dominated by a diverse number of native perennial grasses and forbs (Table 08C-09.7, Table 08C-09.10, Table 08C-09.11). Sagebrush began to re-establish and became co-dominant with perennial grasses in 2015, and the community transitioned back to a sagebrush-dominated state in 2020 (Table 08C-09.12). The introduced perennial grass species bulbous bluegrass (*Poa bulbosa*) was observed for the first time in 2020 and increased in cover and frequency in 2025. Although abundance is low as of the most recent sample year (Table 08C-09.10), bulbous bluegrass could lead to reduced diversity in the understory should it continue to increase in the future.

This site likely serves as adequate summer range for mule deer due to the abundant and/or diverse shrub and herbaceous components (Table 08C-09.10, Table 08C-09.11, Table 08C-09.12). Deer presence was low in most sample years but was moderate in 2005 according to pellet transect data. Elk presence appears to have decreased over time with presence being moderate in 2000 and 2005,but presence has been considered low in subsequent years. Cattle presence has varied between absent and high over the sample period; cattle presence was low in 2025. Utilization of preferred browse follows no clear trend, but mountain big sagebrush showed

signs of high utilization in 1995 and 2015. However, on-site observations in 2025 noted that there was little to no utilization: this may reflect the decrease in wildlife and cattle presence, but it may also highlight the relationship between utilization and browse density (Table 08C-09.9, Table 08C-09.13).

## Trend Summary Tables

**Table 08C-09.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 25.9 | 0.7 | - | - | - | - |
| 2000 | 24.9 | 0.2 | - | - | - | - |
| 2005 | 3.2 | 0.5 | - | 3.2 | 2.7 | - |
| 2010 | 9.4 | 2.2 | - | 12.7 | 4.9 | - |
| 2015 | 18.3 | 2.3 | - | 25.2 | 6.0 | - |
| 2020 | 27.7 | 2.3 | - | 33.6 | 3.2 | - |
| 2025 | 34.3 | 2.8 | - | 41.5 | 2.9 | - |

**Table 08C-09.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 431 | 270 | 383 | - | 13.1 | 2.4 | 21.2 |
| 2000 | - | 419 | 48 | 329 | - | 17.1 | 0.3 | 20.4 |
| 2005 | - | 342 | 379 | 291 | - | 18.0 | 9.0 | 14.9 |
| 2010 | 96 | 435 | 206 | 229 | 2.7 | 34.4 | 1.3 | 8.6 |
| 2015 | 148 | 438 | 170 | 294 | 0.8 | 24.5 | 0.9 | 9.2 |
| 2020 | 43 | 403 | 321 | 276 | 0.3 | 17.5 | 3.7 | 11.8 |
| 2025 | 7 | 348 | 340 | 260 | 0.0 | 17.6 | 7.3 | 12.4 |

**Table 08C-09.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 8.7 | 0.1 | 61.2 | 0.1 | 1.8 | 55.0 |
| 2000 | 6.6 | 0.0 | 70.0 | 1.2 | 1.4 | 61.1 |
| 2005 | 36.6 | 0.0 | 21.0 | 2.4 | 2.1 | 44.6 |
| 2010 | 6.6 | - | 56.8 | 1.0 | 1.6 | 61.9 |
| 2015 | 15.3 | 1.7 | 36.1 | 0.9 | 1.4 | 57.1 |
| 2020 | 15.1 | 1.1 | 46.9 | 7.7 | 1.7 | 52.6 |
| 2025 | 17.7 | 0.6 | 44.4 | 3.7 | 2.2 | 58.4 |

**Table 08C-09.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer/Pronghorn | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 3 | 7 | - | - |
| 2000 | 5 | 4 | 7 | - | 3 |
| 2005 | 3 | 8 | 9 | 1 | 20 |
| 2010 | 5 | 21 | 4 | - | 4 |
| 2015 | 1 | 11 | 14 | 3 | 15 |
| 2020 | 9 | 11 | 4 | - | 3 |
| 2025 | 2 | 6 | 2 | - | 4 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 4.4 (10.8) | 6.7 (16.6) | 30.2 (74.5) | - | - |
| 2005 | 14.5 (35.9) | 32.8 (81.1) | 30.2 (74.5) | 52.3 (129.1)* | - |
| 2010 | 19.6 (48.4) | 8.1 (19.9) | 14.1 (34.8) | 17.4 (43.0)* | - |
| 2015 | - | 8.7 (21.5) | 20.1 (49.7) | - | - |
| 2020 | 29.8 (73.5) | 15.4 (38.1) | 4.0 (9.9) | 8.7 (21.5)* | - |
| 2025 | 5.1 (12.6) | 8.1 (19.9) | 5.3 (13.2) | 8.7 (21.5)* | - |

*Pellets per acre (ha)

**Table 08C-09.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Dactylis glomerata[i] (orchardgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Melica bulbosa (oniongrass) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1995 | 174 | 96 | - | 39 | 49 | 28 | 180 | 26 | 16 | - | 213 | - | 43 | 13 | 15 | - |
| 2000 | 141 | 72 | - | 33 | - | 34 | 116 | 17 | 66 | - | 80 | - | 188 | 50 | - | - |
| 2005 | 57 | 51 | - | 19 | - | 11 | 232 | - | 50 | 3 | 6 | - | 58 | 35 | 13 | 16 |
| 2010 | 25 | 55 | 96 | 40 | - | 22 | 308 | 88 | 83 | 4 | 18 | - | 185 | 29 | 30 | 4 |
| 2015 | 6 | 11 | 148 | 17 | - | 7 | 244 | 5 | 67 | 6 | 22 | - | 135 | 115 | 226 | 3 |
| 2020 | 44 | 8 | 43 | 8 | - | 32 | 222 | 10 | 181 | 1 | 23 | 13 | 62 | 77 | 167 | 9 |
| 2025 | 57 | 8 | 7 | 26 | - | 9 | 145 | - | 145 | - | 38 | 56 | 58 | 35 | 82 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1995 | 3.5 | 1.7 | - | 0.6 | 0.3 | 0.2 | 0.8 | 0.4 | 0.1 | - | 4.5 | - | 0.9 | 0.1 | 0.1 | - |
| 2000 | 4.3 | 1.4 | - | 1.0 | - | 0.6 | 1.0 | 0.3 | 1.9 | - | 1.9 | - | 3.4 | 1.4 | - | - |
| 2005 | 1.1 | 2.5 | - | 0.3 | - | 0.3 | 7.4 | - | 1.5 | 0.0 | 0.0 | - | 2.4 | 1.7 | 0.1 | 0.5 |
| 2010 | 1.2 | 2.9 | 2.7 | 1.4 | - | 0.5 | 9.4 | 3.5 | 5.5 | 0.3 | 0.1 | - | 6.5 | 2.4 | 0.3 | 0.4 |
| 2015 | 0.1 | 0.3 | 0.8 | 0.5 | - | 0.1 | 5.1 | 0.0 | 3.6 | 0.2 | 0.8 | - | 3.9 | 4.4 | 5.4 | 0.0 |
| 2020 | 0.7 | 0.0 | 0.3 | 0.0 | - | 0.5 | 1.7 | 0.0 | 5.3 | 0.0 | 0.6 | 0.3 | 1.4 | 2.3 | 4.7 | 0.0 |
| 2025 | 1.0 | 0.1 | 0.0 | 0.6 | - | 0.1 | 2.7 | - | 7.2 | - | 0.4 | 2.5 | 1.0 | 1.2 | 0.8 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08C-09.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Antennaria (pussytoes) | Arabis drummondii (Drummond's rockcress) | Arenaria (sandwort) | Artemisia dracunculus (tarragon) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Camelina microcarpa[ai] (littlepod false flax) | Castilleja flava (yellow Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 151 | 86 | - | 4 | 9 | 16 | - | 8 | 4 | 4 | - | - | 4 | - | - | 154 | 169 |
| 2000 | 9 | 13 | - | - | 6 | 16 | - | 4 | 8 | 3 | - | - | 8 | - | - | 5 | 3 |
| 2005 | 59 | 29 | - | - | - | 1 | - | - | 11 | - | - | - | - | 10 | 2 | 78 | 73 |
| 2010 | 47 | 7 | - | - | 5 | 3 | - | - | 10 | - | - | - | - | - | - | 110 | 62 |
| 2015 | 63 | 4 | 4 | 1 | 1 | 6 | 1 | - | 11 | - | - | 1 | - | - | - | 1 | 94 |
| 2020 | 9 | 10 | - | 3 | 1 | 3 | - | - | 7 | - | 3 | - | - | - | - | 300 | 88 |
| 2025 | 25 | 27 | 4 | - | - | 13 | - | 3 | 12 | - | - | - | 1 | 45 | - | 315 | 59 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.9 | 0.4 | - | 0.0 | 0.0 | 0.5 | - | 0.0 | 0.2 | 0.0 | - | - | 0.0 | - | - | 1.0 | 1.1 |
| 2000 | 0.2 | 0.0 | - | - | 0.0 | 0.1 | - | 0.1 | 0.2 | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.0 |
| 2005 | 0.5 | 0.1 | - | - | - | 0.0 | - | - | 0.3 | - | - | - | - | 0.0 | 0.0 | 0.4 | 0.2 |
| 2010 | 0.4 | 0.0 | - | - | 0.0 | 0.0 | - | - | 0.2 | - | - | - | - | - | - | 0.4 | 0.2 |
| 2015 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | 0.0 | 0.4 |
| 2020 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | - | - | 0.2 | - | 0.0 | - | - | - | - | 2.7 | 0.8 |
| 2025 | 0.1 | 0.1 | 0.0 | - | - | 0.6 | - | 0.0 | 0.1 | - | - | - | 0.0 | 0.3 | - | 5.2 | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Heterotheca villosa (hairy false goldenaster) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lomatium triternatum (nineleaf biscuitroot) | Lupinus argenteus (silvery lupine) | Mertensia oblongifolia (oblongleaf bluebells) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 36 | - | 11 | 18 | - | 2 | 11 | 132 | 52 | - | 3 | - | - | - | 9 | 197 | 3 |
| 2000 | 8 | - | 16 | - | - | - | 5 | 146 | 59 | - | 9 | - | - | - | - | 184 | - |
| 2005 | 4 | - | 7 | 6 | 12 | - | - | 31 | - | 120 | 13 | 44 | 44 | - | 3 | 115 | 2 |
| 2010 | 3 | 4 | - | - | - | - | 3 | 35 | 13 | - | 22 | 2 | 4 | - | - | 111 | - |
| 2015 | 11 | 4 | 2 | 42 | - | 42 | 3 | 44 | 26 | 6 | 25 | 29 | 26 | 2 | - | 108 | 1 |
| 2020 | 0 | - | - | 2 | - | 4 | 6 | 62 | 7 | - | 19 | 4 | 2 | 4 | 3 | 137 | - |
| 2025 | - | 4 | - | - | 10 | 3 | 5 | 57 | 13 | 21 | 9 | 6 | 3 | 2 | 3 | 130 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.3 | - | 0.1 | 0.0 | - | 0.0 | 0.0 | 7.4 | 1.3 | - | 0.0 | - | - | - | 0.0 | 6.8 | 0.0 |
| 2000 | 0.1 | - | 0.1 | - | - | - | 0.0 | 7.9 | 1.6 | - | 0.2 | - | - | - | - | 6.9 | - |
| 2005 | 0.2 | - | 0.0 | 0.0 | 0.2 | - | - | 1.9 | - | 1.9 | 0.6 | 1.0 | 0.8 | - | 0.0 | 7.4 | 0.0 |
| 2010 | 0.0 | 0.0 | - | - | - | - | 0.0 | 2.3 | 0.2 | - | 0.9 | 0.0 | 0.0 | - | - | 2.8 | - |
| 2015 | 0.1 | 0.0 | 0.0 | 1.1 | - | 0.2 | 0.0 | 1.7 | 0.6 | 0.0 | 0.9 | 0.1 | 0.1 | 0.0 | - | 2.1 | 0.0 |
| 2020 | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | 2.8 | 0.2 | - | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 | - |
| 2025 | - | 0.0 | - | - | 0.0 | 0.0 | 0.1 | 2.6 | 0.2 | 0.1 | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | 6.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Microsteris gracilis[a] (slender phlox) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla (cinquefoil) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) | Trifolium longipes (longstalk clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 9 | - | 27 | 129 | 69 | - | - | - | 9 | 16 | - | - | 58 | 2 | - | 75 |
| 2000 | - | - | - | 36 | 47 | 27 | - | - | - | 11 | 13 | - | - | 3 | - | - | 59 |
| 2005 | 10 | 8 | - | 7 | 163 | 294 | - | 1 | 7 | - | 5 | - | 3 | 9 | - | - | 69 |
| 2010 | 1 | - | - | 2 | 48 | 137 | - | - | - | - | - | - | 3 | 3 | - | - | 54 |
| 2015 | 17 | 0 | 2 | 13 | 103 | 1 | 4 | - | - | 2 | 3 | - | 3 | 62 | 1 | 1 | 47 |
| 2020 | 55 | 3 | - | 9 | 118 | 49 | - | - | - | - | - | 7 | 4 | 5 | - | - | 59 |
| 2025 | 116 | 5 | 1 | 7 | 76 | 144 | - | - | - | 6 | - | 10 | - | 2 | 3 | - | 80 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | 0.6 | 1.4 | 0.2 | - | - | - | 0.1 | 0.1 | - | - | 0.2 | 0.0 | - | 0.7 |
| 2000 | - | - | - | 1.3 | 0.4 | 0.3 | - | - | - | 0.1 | 0.1 | - | - | 0.0 | - | - | 1.0 |
| 2005 | 0.1 | 0.1 | - | 0.3 | 2.5 | 4.4 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.2 | - | - | 0.6 |
| 2010 | 0.0 | - | - | 0.0 | 0.6 | 0.7 | - | - | - | - | - | - | 0.4 | 0.0 | - | - | 0.5 |
| 2015 | 0.1 | 0.0 | 0.0 | 0.4 | 0.7 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.5 | 0.0 | 0.0 | 0.3 |
| 2020 | 0.1 | 0.0 | - | 0.2 | 0.6 | 0.1 | - | - | - | - | - | 0.0 | 0.4 | 0.0 | - | - | 1.3 |
| 2025 | 0.8 | 0.2 | 0.0 | 0.2 | 0.6 | 0.6 | - | - | - | 0.2 | - | 0.1 | - | 0.0 | 0.0 | - | 0.6 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | unknown annual forb[a] (unknown forb) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|
| year | Nested | |
| 1995 | 3 | - |
| 2000 | - | - |
| 2005 | - | 2 |
| 2010 | - | - |
| 2015 | - | - |
| 2020 | - | - |
| 2025 | - | - |
| year | Average Cover (%) | |
| 1995 | 0.0 | - |
| 2000 | - | - |
| 2005 | - | 0.0 |
| 2010 | - | - |
| 2015 | - | - |
| 2020 | - | - |
| 2025 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08C-09.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum microtheceum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.3 | - | 1.7 | 0.4 | 2.3 | - | - | - | 0.1 | 1.1 |
| 2010 | 0.4 | - | 11.2 | 2.1 | 2.8 | - | - | - | - | 1.1 |
| 2015 | 0.4 | - | 23.7 | 3.9 | 2.1 | - | - | - | 0.2 | 0.9 |
| 2020 | 0.5 | - | 32.3 | 3.2 | - | - | - | - | 0.3 | 0.5 |
| 2025 | 0.5 | - | 39.8 | 2.9 | - | - | - | 0 | 0.5 | 0.7 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | 0.2 | 0.0 | 24.7 | 0.5 | - | - | 0.1 | - | - | 1.0 |
| 2000 | 0.2 | - | 23.5 | 0.2 | - | - | - | - | 0.0 | 1.2 |
| 2005 | 0.0 | - | 1.2 | 0.5 | 0.0 | - | - | - | 0.1 | 1.8 |
| 2010 | 0.0 | - | 7.8 | 2.2 | 0.0 | - | 0.0 | - | 0.0 | 1.6 |
| 2015 | 0.2 | - | 17.3 | 2.3 | 0.0 | - | 0.0 | - | 0.1 | 0.7 |
| 2020 | 0.1 | - | 26.8 | 2.3 | - | - | 0.0 | 0.0 | 0.0 | 0.7 |
| 2025 | 0.1 | - | 33.2 | 2.7 | - | 0.0 | - | 0.1 | 0.2 | 0.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-09.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

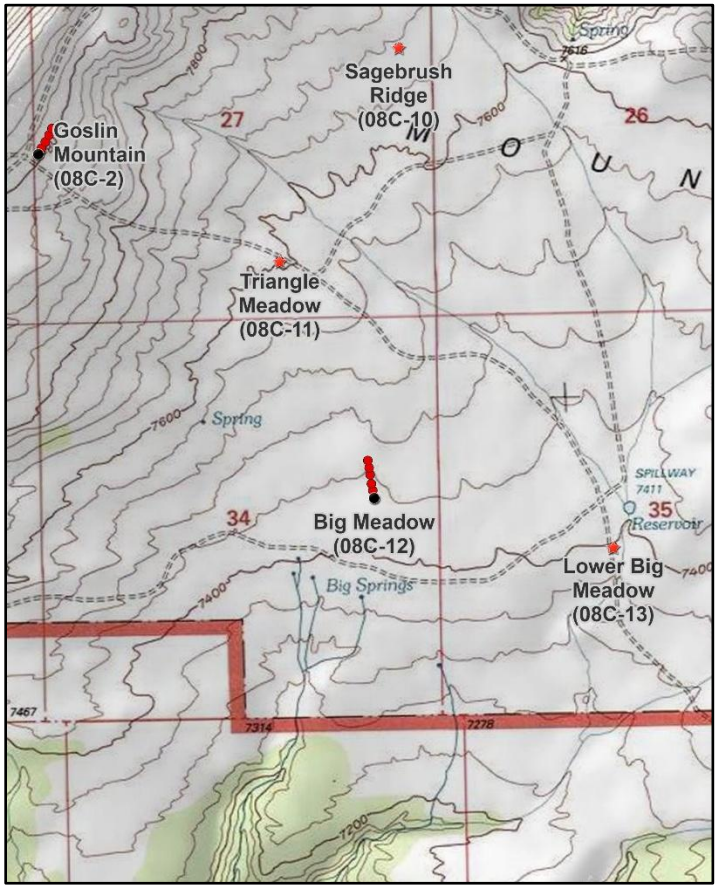
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 260 | - | 23 | 69 | 8 | 23 | 8 | 0 | 59/102 |
| 2000 | 80 | - | 0 | 100 | 0 | 25 | 50 | 0 | 69/85 |
| 2005 | 80 | - | 50 | 50 | 0 | 0 | 75 | 0 | 34/58 |
| 2010 | 120 | - | 67 | 33 | 0 | 17 | 33 | 17 | 30/61 |
| 2015 | 120 | - | 17 | 83 | 0 | 17 | 83 | 17 | 36/73 |
| 2020 | 60 | - | 0 | 100 | 0 | 33 | 67 | 33 | 26/70 |
| 2025 | 100 | - | 20 | 80 | 0 | 60 | 0 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 80 | - | 0 | 75 | 25 | 50 | 50 | 25 | 14/24 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 3380 | 20 | 7 | 80 | 14 | 25 | 2 | 4 | 76/109 |
| 2000 | 3600 | 200 | 7 | 64 | 29 | 7 | 1 | 9 | 72/108 |
| 2005 | 1880 | 40 | 69 | 31 | 0 | 3 | 3 | 1 | 19/28 |
| 2010 | 2520 | - | 4 | 96 | 0 | 46 | 17 | 2 | 39/65 |
| 2015 | 2560 | 20 | 12 | 88 | 1 | 47 | 10 | 9 | 41/88 |
| 2020 | 5660 | 1420 | 51 | 46 | 4 | 19 | 10 | 3 | 49/102 |
| 2025 | 5780 | 2020 | 14 | 85 | 2 | 34 | 2 | 9 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 174/215 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 38/59 |
| 2010 | - | - | - | - | - | - | - | - | 48/62 |
| 2015 | - | - | - | - | - | - | - | - | 74/91 |
| 2020 | - | - | - | - | - | - | - | - | 75/116 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 200 | - | 10 | 90 | 0 | 0 | 0 | 0 | 21/33 |
| 2000 | 260 | - | 23 | 69 | 8 | 0 | 0 | 0 | 24/35 |
| 2005 | 240 | 20 | 8 | 92 | 0 | 0 | 0 | 0 | 26/43 |
| 2010 | 2020 | - | 14 | 86 | 0 | 0 | 0 | 10 | 21/30 |
| 2015 | 2920 | 60 | 21 | 77 | 1 | 27 | 1 | 6 | 22/36 |
| 2020 | 1840 | 40 | 3 | 80 | 16 | 37 | 17 | 24 | 19/32 |
| 2025 | 1380 | 20 | 6 | 81 | 13 | 7 | 0 | 13 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 10/37 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

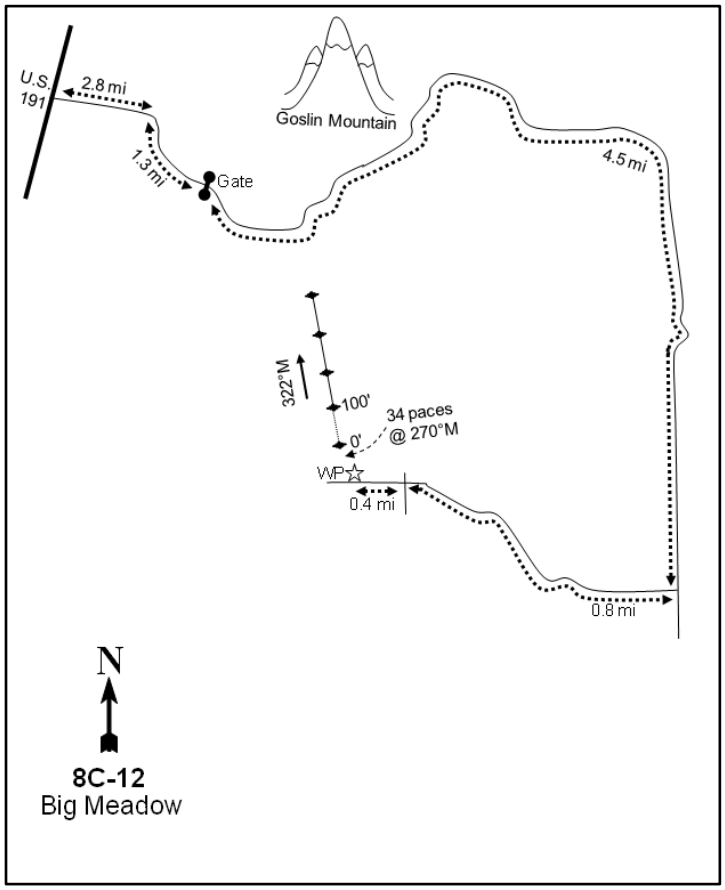
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | 5440 | - | 1 | 99 | 0 | 0 | 0 | 0 | 29/36 |
| 2000 | 6360 | - | 18 | 82 | 0 | 0 | 0 | 0 | 11/25 |
| 2005 | 1260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/39 |
| 2010 | 1740 | - | 2 | 98 | 0 | 13 | 0 | 0 | 12/48 |
| 2015 | 1480 | 500 | 10 | 91 | 0 | 0 | 0 | 4 | 9/36 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/17 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/28 |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 4/8 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/23 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Holodiscus dumosus -- (rockspirea) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 53/92 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 8/24 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/27 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/18 |
| 2020 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | 6/13 |
| 2025 | 460 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 41/101 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 42/78 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 17/60 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 26/123 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/140 |
| 2020 | 40 | - | 0 | 50 | 50 | 0 | 100 | 50 | 41/144 |
| 2025 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 340 | - | 0 | 100 | 0 | 41 | 0 | 0 | 50/118 |
| 2000 | 320 | - | 6 | 94 | 0 | 0 | 0 | 0 | 52/105 |
| 2005 | 220 | - | 9 | 91 | 0 | 0 | 0 | 0 | 37/115 |
| 2010 | 400 | - | 5 | 95 | 0 | 5 | 0 | 0 | 41/104 |
| 2015 | 380 | - | 21 | 79 | 0 | 47 | 0 | 0 | 38/90 |
| 2020 | 280 | - | 0 | 86 | 14 | 14 | 79 | 21 | 39/105 |
| 2025 | 360 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 26/57 |
| 2010 | - | - | - | - | - | - | - | - | 29/69 |
| 2015 | - | - | - | - | - | - | - | - | 28/41 |
| 2020 | - | - | - | - | - | - | - | - | 27/87 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# BIG MEADOW - STUDY NO. 08C-12




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Goslin Mountain NE; Township 3N, Range 23E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 642944 East 4535095 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 172 |
| Transect Bearing | 358° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Belt 2: No Rebar |

## Directions to Site

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before reaching the Wyoming-Utah border, turn east on the Antelope Flat Road toward Goslin Mountain. Go 2.8 miles and turn right toward Goslin Mountain. Bear left and drive 1.3 miles to a gate. Pass through the gate and continue 4.5 miles to a fork. Bear right and proceed 0.8 miles to a four-way intersection. Continue straight west and drive 0.4 miles to a witness post that is located 50 feet off of the north side of the road. From the witness post, walk 34 paces at 270 degrees magnetic to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | GOSLIN MOUNTAIN |
| Elevation | 7,450ft (2,271m) |
| Aspect | Southeast |
| Slope | 2-3% |
| Sample Dates | 07/06/1995, 07/06/2000, 08/04/2010, 06/24/2015, 07/20/2020, 07/15/2025 |

## Wildlife Habitat and Vegetation History

**Table 08C-12.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | crucial | summer |

**Table 08C-12.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1995 | Semi-Wet Meadow | No Encroachment |
| 2000 | Semi-Wet Meadow | No Encroachment |
| 2010 | Semi-Wet Meadow | No Encroachment |
| 2015 | Semi-Wet Meadow | No Encroachment |
| 2020 | Semi-Wet Meadow | No Encroachment |
| 2025 | Semi-Wet Meadow | No Encroachment |

## Site Notes

The study was established to monitor concentrated use by wildlife and livestock on the small meadows in the area. Water is found on the surface of the meadow until sometime in June or July depending on weather conditions. The surrounding area was treated by a lop and scatter to remove encroaching twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) in the fall of 2006 as part of the Goslin Mountain P/J Encroachment Removal (WRI Project #297). The area is administered by the Utah Division of Wildlife Resources (DWR), but grazing is managed by the Bureau of Land Management (BLM) as part of the Goslin Mountain allotment. Sage-grouse were seen on the road next to the site in 2015. In addition, cattle were seen on and/or by the transect and graminoids were heavily grazed in 2020 and 2025.

## Soils

**Table 08C-12.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.4 | 34.0 | 33.7 | 32.3 | 6.1 | 5.5 | 256.0 | 1.2 | 07/06/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Semiwet (Fresh Meadow) |
| NRCS Ecological Site # | R047XC004UT |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1995, this site has existed as a semi-wet meadow plant community (Table 08C-12.4). The dominant plant species shifted from arctic rush (*Juncus arcticus*) to Kentucky bluegrass (*Poa pratensis*) in 2015, possibly due to high grazing pressure; pellet group data indicates that cattle presence was high during the 2020 and 2025 sample years (Table 08C-12.9). However, Kentucky bluegrass and arctic rush were co-dominant in 2025 (Table 08C-12.10). Without a major disturbance, this site will likely continue to exist as a semi-wet meadow plant community in the future.

This site likely serves as adequate summer range for mule deer due to the abundant and diverse herbaceous component (Table 08C-12.10, Table 08C-12.11, Table 08C-12.12). According to pellet transect data deer presence has been low to absent in most sample years. Excluding 2000 and 2015, cattle presence has been very high over the sample period (Table 08C-12.9). On-site observations in 2025 noted that there was heavy utilization (>40%) of grasses and moderate utilization (>20-40%) of forbs. Observations also state that cattle were seen in 2025 and that hummocking was occurring on over half of the site.

## Trend Summary Tables

**Table 08C-12.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2010 | - | - | - | - | - | - |
| 2015 | - | - | - | - | - | - |
| 2020 | - | - | - | - | - | - |
| 2025 | 0.0 | - | - | - | - | - |

**Table 08C-12.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 496 | 11 | 433 | - | 40.8 | 0.2 | 28.5 |
| 2000 | - | 492 | - | 339 | - | 59.5 | - | 13.6 |
| 2010 | - | 479 | 13 | 252 | - | 68.0 | 0.3 | 11.0 |
| 2015 | - | 492 | 24 | 314 | - | 61.0 | 0.1 | 20.0 |
| 2020 | - | 492 | 20 | 402 | - | 54.2 | 0.4 | 25.8 |
| 2025 | - | 492 | 0 | 416 | - | 53.8 | 0.0 | 34.7 |

**Table 08C-12.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | - | 5.2 | 76.7 | - | - | 69.0 |
| 2000 | 0.2 | 4.8 | 85.8 | - | - | 70.1 |
| 2010 | 0.5 | - | 77.4 | - | - | 67.5 |
| 2015 | 0.0 | 0.0 | 41.4 | - | - | 78.3 |
| 2020 | 0.0 | 0.1 | 49.2 | - | 1.5 | 72.6 |
| 2025 | 2.0 | 0.2 | 64.3 | 0.9 | 0.0 | 69.5 |

**Table 08C-12.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 21 | - | - | - | - |
| 2000 | 2 | 1 | 1 | - | - |
| 2010 | 40 | 2 | 3 | - | 5 |
| 2015 | 17 | 2 | - | - | 1 |
| 2020 | 56 | 2 | - | - | 5 |
| 2025 | 62 | 3 | - | 4 | 30 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 10.9 (26.9) | - | - | - | - |
| 2010 | 164.1 (405.3) | 20.8 (51.3) | - | - | - |
| 2015 | - | - | - | - | - |
| 2020 | 99.5 (245.7) | 2.7 (6.6) | - | - | - |
| 2025 | 70.4 (173.9) | 2.7 (6.6) | 1.3 (3.3) | 43.6 (107.6)* | - |

*Pellets per acre (ha)

**Table 08C-12.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Carex (sedge) | Carex nebrascensis (Nebraska sedge) | Deschampsia cespitosa (tufted hairgrass) | Elymus trachycaulus (slender wheatgrass) | Hordeum brachyantherum (meadow barley) | Juncus arcticus (arctic rush) | Muhlenbergia richardsonis (mat muhly) | Phleum pratense[i] (timothy) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | - | 146 | 233 | 88 | 89 | 9 | 410 | 16 | - | 440 | - | - |
| 2000 | - | 39 | 303 | 47 | 29 | 31 | 444 | 1 | 2 | 223 | - | - |
| 2010 | - | 59 | 135 | 63 | 7 | - | 403 | - | - | 354 | - | 3 |
| 2015 | 1 | 6 | 156 | - | 42 | - | 220 | 11 | - | 484 | 4 | 25 |
| 2020 | - | 41 | 169 | 2 | 44 | - | 401 | 37 | - | 430 | 2 | 15 |
| 2025 | - | 247 | 24 | - | 79 | - | 422 | 67 | - | 445 | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | - | 2.9 | 2.8 | 1.9 | 0.7 | 0.0 | 16.4 | 0.1 | - | 16.1 | - | - |
| 2000 | - | 1.4 | 14.0 | 0.8 | 0.2 | 0.3 | 34.3 | 0.0 | 0.0 | 8.5 | - | - |
| 2010 | - | 1.2 | 8.4 | 1.4 | 0.1 | - | 33.8 | - | - | 23.0 | - | 0.1 |
| 2015 | 0.0 | 0.2 | 5.2 | - | 0.2 | - | 6.0 | 0.0 | - | 48.9 | 0.0 | 0.3 |
| 2020 | - | 0.6 | 4.9 | 0.0 | 0.3 | - | 16.0 | 0.5 | - | 31.3 | 0.0 | 0.6 |
| 2025 | - | 8.8 | 0.3 | - | 2.9 | - | 17.6 | 0.6 | - | 23.6 | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08C-12.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Argentina anserina (silverweed cinquefoil) | Astragalus agrestis (purple milkvetch) | Astragalus drummondii (Drummond's milkvetch) | Ceratocephala testiculata[ai] (curveseed butterwort) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Equisetum laevigatum (smooth horsetail) | Erigeron (fleabane) | Gentiana (gentian) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Myosotis asiatica (Asian forget-me-not) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 48 | 10 | - | 26 | 3 | 200 | 37 | - | 11 | 95 | - | 72 | 3 | - | - | - | 13 |
| 2000 | 8 | 3 | - | 3 | - | 199 | - | - | - | - | - | 90 | 5 | - | - | - | 52 |
| 2010 | 27 | 7 | - | 15 | - | 23 | 30 | - | - | 10 | 8 | 70 | 12 | 20 | 1 | - | 5 |
| 2015 | 32 | 78 | 3 | 12 | - | 24 | 94 | - | - | 15 | 11 | 55 | - | - | 2 | - | - |
| 2020 | 65 | 99 | - | 28 | 1 | 43 | 133 | - | - | 162 | - | 86 | - | 8 | 15 | 1 | - |
| 2025 | 116 | 91 | - | 45 | - | 20 | 244 | 35 | - | 108 | - | 66 | - | 19 | - | 4 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 1.4 | 0.1 | - | 0.9 | 0.0 | 3.9 | 0.1 | - | 0.2 | 1.5 | - | 0.3 | 0.0 | - | - | - | 0.0 |
| 2000 | 0.1 | 0.0 | - | 0.0 | - | 5.1 | - | - | - | - | - | 1.7 | 0.0 | - | - | - | 0.8 |
| 2010 | 1.4 | 0.1 | - | 1.1 | - | 0.2 | 0.8 | - | - | 0.5 | 0.3 | 0.5 | 0.1 | 0.3 | 0.0 | - | 0.0 |
| 2015 | 0.5 | 2.7 | 0.0 | 0.8 | - | 0.3 | 6.1 | - | - | 0.5 | 0.0 | 0.3 | - | - | 0.0 | - | - |
| 2020 | 1.8 | 1.0 | - | 1.2 | 0.0 | 0.8 | 1.6 | - | - | 6.8 | - | 0.3 | - | 0.0 | 0.2 | 0.0 | - |
| 2025 | 2.4 | 1.7 | - | 2.1 | - | 0.1 | 4.5 | 0.7 | - | 1.5 | - | 0.2 | - | 0.7 | - | 0.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Oxytropis deflexa (nodding locoweed) | Packera multilobata (lobeleaf groundsel) | Packera paupercula (balsam groundsel) | Phlox longifolia (longleaf phlox) | Potentilla gracilis (slender cinquefoil) | Pseudostellaria jamesiana (tuber starwort) | Silene drummondii (Drummond's campion) | Sisyrinchium idahoense (Idaho blue-eyed grass) | Stellaria longipes (longstalk starwort) | Symphyotrichum (aster) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) | Viola adunca (hookedspur violet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1995 | - | - | 97 | - | 69 | - | - | 104 | 5 | 36 | 146 | 316 | - | - | - | 124 |
| 2000 | - | - | - | - | 25 | - | - | - | 0 | - | 35 | 30 | - | - | - | 171 |
| 2010 | - | 29 | - | - | 70 | - | - | - | 10 | 35 | 81 | 67 | 3 | 4 | - | 3 |
| 2015 | 1 | 29 | 15 | - | 54 | 16 | - | 1 | 24 | 11 | 89 | 124 | - | 8 | - | 41 |
| 2020 | 3 | 9 | 42 | - | 59 | 38 | - | 22 | - | 9 | 222 | 139 | - | 5 | 8 | 63 |
| 2025 | 19 | - | 75 | 1 | 77 | - | 1 | 54 | 91 | 5 | 261 | 143 | - | 0 | 14 | 123 |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | - | 2.7 | - | 1.6 | - | - | 1.2 | 0.0 | 0.7 | 3.1 | 8.5 | - | - | - | 2.3 |
| 2000 | - | - | - | - | 0.4 | - | - | - | 0.0 | - | 0.9 | 0.8 | - | - | - | 3.8 |
| 2010 | - | 0.5 | - | - | 1.3 | - | - | - | 0.3 | 0.6 | 2.2 | 1.1 | 0.0 | 0.0 | - | 0.0 |
| 2015 | 0.1 | 0.3 | 0.7 | - | 1.4 | 0.1 | - | 0.0 | 0.4 | 0.1 | 1.7 | 3.5 | - | 0.1 | - | 0.4 |
| 2020 | 0.0 | 0.0 | 0.6 | - | 1.0 | 0.2 | - | 0.0 | - | 0.2 | 7.3 | 2.5 | - | 0.2 | 0.0 | 0.6 |
| 2025 | 0.5 | - | 1.8 | 0.0 | 2.2 | - | 0.0 | 0.5 | 1.3 | 0.4 | 9.4 | 2.6 | - | 0.0 | 0.2 | 1.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08C-12.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) |
|---|---|
| year | Line |
| 1995 | - |
| 2000 | - |
| 2010 | - |
| 2015 | - |
| 2020 | - |
| 2025 | - |
| year | Quadrat Cover (%) |
| 1995 | - |
| 2000 | - |
| 2010 | - |
| 2015 | - |
| 2020 | - |
| 2025 | 0.0 |

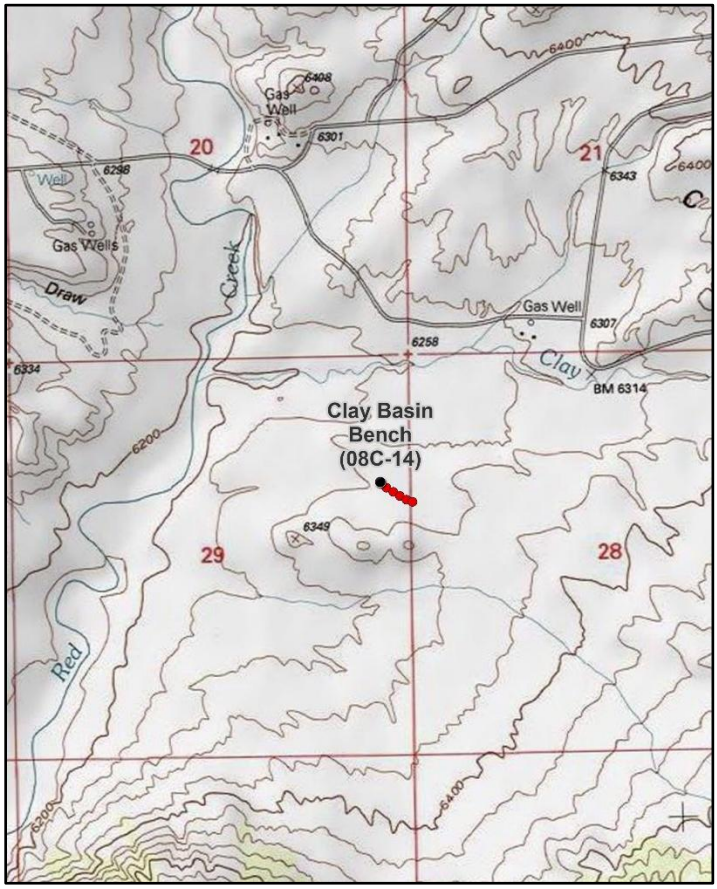
t - Tree Species; p - Preferred Browse; i - Introduced Species

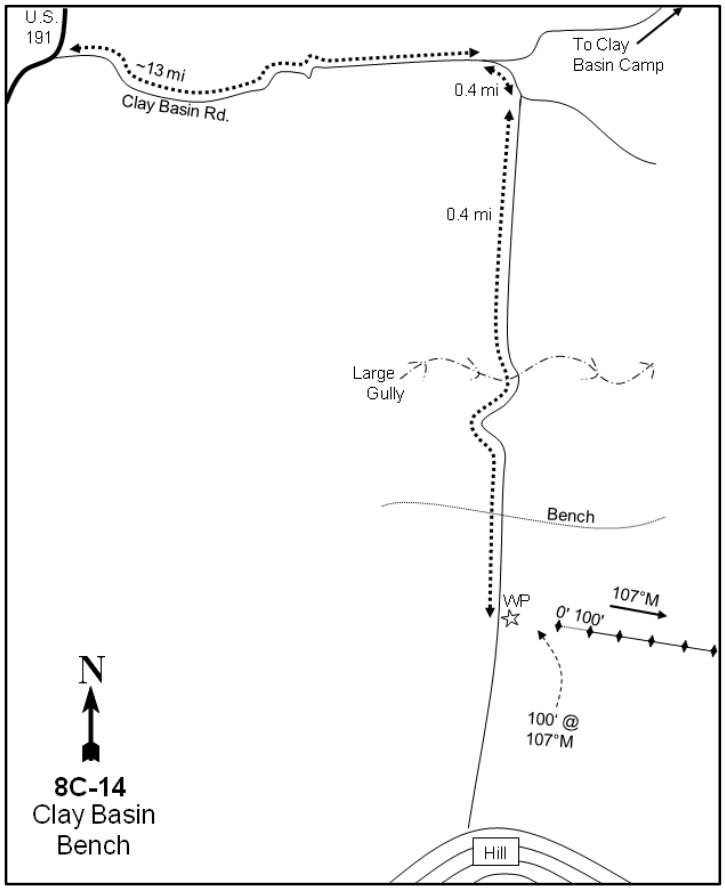
**Table 08C-12.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2025 | 40 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# CLAY BASIN BENCH - STUDY NO. 08C-14




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Clay Basin NW; Township 3N, Range 24E, Section 29 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 649495 East 4537023 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 102 |
| Transect Bearing | 107° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191. Continue over the state line into Wyoming and turn right just after Minnies Gap onto Clay Basin Road. Drive approximately 13 miles toward Clay Basin to the turn off to Clay Basin Camp. Turn right and proceed 0.4 miles to another intersection. Turn right again and travel 0.4 miles, going through the large gully and onto the bench. The witness post is on the left (east) side of the road. From the witness post, the 0-foot baseline stake is located 100 feet (17 paces) away at 115 degrees magnetic. The 0-foot stake is marked with browse tag #102.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | CLAY BASIN |
| Elevation | 6,300ft (1,920m) |
| Aspect | West |
| Slope | 3% |
| Sample Dates | 09/20/2000, 07/28/2005, 07/27/2010, 06/24/2015, 07/21/2020, 07/15/2025 |

**Table 08C-14.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Utility - Natural Gas Pipeline | - | - | 2013 | - |

## Wildlife Habitat and Vegetation History

**Table 08C-14.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | crucial | year-long |

**Table 08C-14.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2000 | Wyoming Big Sagebrush | No Encroachment |
| 2005 | Perennial Grass/Wyoming Big Sagebrush | No Encroachment |
| 2010 | Perennial Grass/Wyoming Big Sagebrush | No Encroachment |
| 2015 | Perennial Grass/Wyoming Big Sagebrush | No Encroachment |
| 2020 | Broom Snakeweed/Wyoming Big Sagebrush | No Encroachment |
| 2025 | Broom Snakeweed/Wyoming Big Sagebrush | No Encroachment |

## Site Notes

Between 2005 and 2015, an underground pipeline was laid next to the road that is adjacent to the transect, and the trenching affected the first belt of the transect. Deer and elk have used the area primarily as winter range with antelope also using the area. Deer and antelope pellets were all classified as a combined group due to difficulties in differentiating between species.

## Soils

**Table 08C-14.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.3 | 65.6 | 17.1 | 17.3 | 1.2 | 6.3 | 89.6 | 0.5 | 09/20/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R047XB222UT |
| States and Transitions | 2000 - Current Potential State: Community Phase 2.1<br>2005-2015 - Current Potential State: Community Phase 2.2<br>2020-2025 - Current Potential State: Community Phase Undefined |

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has been a dominant shrub species on this site since the study period began in 2000. Over time, sagebrush has decreased in both cover and density: the initial decrease between 2000 and 2005 could possibly be attributed to the drought in 2002/2003 that affected sagebrush populations in other parts of the state. Other shrub species have also been present on this site. Broom snakeweed (*Gutierrezia sarothrae*) in particular has increased over time and was considered to be co-dominant with sagebrush in 2020 and 2025 (Table 08C-14.12, Table 08C-14.13). The herbaceous understory has fluctuated in cover over the sample period. Perennial grasses -- namely Sandberg bluegrass (*Poa secunda*), needle and thread (*Hesperostipa comata*), and/or western wheatgrass (*Pascopyrum smithii*) -- have provided most of the herbaceous cover and were co-dominant with sagebrush between 2005 and 2015, but have since decreased. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed on this site. Although cover has been low in most sample years, there may be potential for cheatgrass to increase if perennial grasses continue to decrease over time (Table 08C-14.7, Table 08C-14.10).

Condition of mule deer winter range on this site has ranged between very poor-poor and fair since 2000; winter range condition was considered to be very poor-poor in 2025. Negative factors contributing to these conditions include a lack of preferred browse cover; reduced perennial grass and forb cover; and the amount of annual grass cover (Table 08C-14.6, Table 08C-14.7, Table 08C-14.15). Pellet transect data indicates that deer/antelope presence has ranged between low and high over the sample period; deer/antelope presence was high in 2025. Cattle have had a moderate presence since 2000. Sagebrush plants have shown signs of varying utilization with no clear trend associated with wildlife or cattle presence (Table 08C-14.9, Table 08C-14.13). On-site observations for 2025 note that heavy utilization (>40%) was evident on grass species.

## Trend Summary Tables

**Table 08C-14.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2000 | 15.8 | 5.7 | - | - | - | - |
| 2005 | 3.0 | 2.7 | - | 1.8 | 1.9 | - |
| 2010 | 2.5 | 4.4 | - | 2.1 | 3.0 | - |
| 2015 | 2.1 | 4.7 | - | 2.7 | 4.4 | - |
| 2020 | 2.3 | 14.8 | - | 1.5 | 15.0 | - |
| 2025 | 3.0 | 25.0 | - | 2.7 | 26.4 | - |

**Table 08C-14.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2000 | 18 | 326 | - | 139 | 0.1 | 5.3 | - | 2.0 |
| 2005 | 2 | 375 | 57 | 16 | 0.0 | 19.5 | 0.8 | 0.2 |
| 2010 | 128 | 396 | 65 | 33 | 2.7 | 29.0 | 1.7 | 0.2 |
| 2015 | 170 | 371 | 269 | 28 | 9.9 | 23.5 | 9.5 | 0.4 |
| 2020 | 130 | 244 | 57 | 39 | 0.8 | 3.1 | 0.5 | 0.7 |
| 2025 | 148 | 154 | 164 | 43 | 1.8 | 2.8 | 4.1 | 0.4 |

**Table 08C-14.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2000 | 43.3 | 22.6 | 29.4 | 0.6 | 0.2 | 28.3 |
| 2005 | 46.2 | 9.3 | 28.9 | 0.1 | 0.2 | 24.2 |
| 2010 | 29.1 | 5.8 | 43.2 | 0.2 | - | 43.8 |
| 2015 | 33.9 | 8.1 | 36.2 | 0.3 | 0.0 | 44.1 |
| 2020 | 43.9 | 5.7 | 42.8 | 0.5 | 0.1 | 24.7 |
| 2025 | 40.3 | 1.9 | 33.0 | 0.7 | 0.1 | 36.8 |

**Table 08C-14.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer/Pronghorn | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit | White-tailed Prairie Dog |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 2000 | 4 | 47 | 3 | - | 9 | - |
| 2005 | 7 | 18 | 2 | - | 83 | - |
| 2010 | 3 | 8 | 1 | - | 6 | - |
| 2015 | 3 | 17 | - | - | 51 | - |
| 2020 | 7 | 29 | - | - | 25 | 74 |
| 2025 | 3 | 47 | 2 | - | 11 | 6 |
| Year | Days Use Per Acre (ha) | | | | | |
| 2000 | 20.3 (50.2) | 53.0 (130.8) | 6.0 (14.9) | - | - | - |
| 2005 | 12.3 (30.5) | 25.5 (62.9) | 3.4 (8.3) | - | - | - |
| 2010 | 15.3 (37.7) | 38.2 (94.4) | - | - | - | - |
| 2015 | 14.5 (35.9) | 6.7 (16.6) | - | - | - | - |
| 2020 | 18.1 (44.8) | 77.1 (190.4) | - | 8.7 (21.5)* | - | - |
| 2025 | 13.1 (32.3) | 59.6 (147.3) | 0.7 (1.7) | - | - | - |

*Pellets per acre (ha)

**Table 08C-14.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Pascopyrum smithii (western wheatgrass) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 2000 | 71 | 18 | 14 | - | 132 | 134 | - | 4 | 80 | - | - | - |
| 2005 | 42 | 2 | 22 | - | 154 | 120 | - | 38 | 269 | 5 | - | - |
| 2010 | 25 | 128 | 14 | - | 187 | 97 | 6 | 25 | 307 | 30 | - | - |
| 2015 | 13 | 132 | 50 | 4 | 226 | 142 | - | - | 209 | - | 3 | 44 |
| 2020 | - | 130 | 3 | 7 | 97 | 106 | - | 3 | 89 | - | 2 | 3 |
| 2025 | 1 | 117 | 1 | 4 | 69 | 75 | - | - | 24 | - | - | 35 |
| year | Average Cover (%) | | | | | | | | | | | |
| 2000 | 1.1 | 0.1 | 0.1 | - | 2.4 | 1.3 | - | 0.0 | 0.4 | - | - | - |
| 2005 | 0.8 | 0.0 | 0.4 | - | 5.8 | 1.7 | - | 0.8 | 10.1 | 0.0 | - | - |
| 2010 | 1.1 | 2.7 | 0.3 | - | 9.1 | 2.9 | 0.2 | 0.9 | 13.4 | 1.0 | - | - |
| 2015 | 0.5 | 9.6 | 0.8 | 0.0 | 13.6 | 4.9 | - | - | 3.5 | - | 0.1 | 0.4 |
| 2020 | - | 0.8 | 0.0 | 0.2 | 1.2 | 0.8 | - | 0.0 | 0.8 | - | 0.0 | 0.0 |
| 2025 | 0.0 | 1.8 | 0.0 | 0.0 | 1.5 | 1.1 | - | - | 0.1 | - | - | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 08C-14.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arabis holboellii[a] (Holboell's rockcress) | Ceratocephala testiculata[ai] (curveseed butterwort) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Erigeron pumilus (shaggy fleabane) | Hymenoxys richardsonii (pingue rubberweed) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Machaeranthera canescens (hoary tansyaster) | Myosotis stricta[ai] (strict forget-me-not) | Penstemon (beardtongue) | Phlox hoodii (spiny phlox) | Physaria (twinpod) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2000 | - | - | - | - | - | - | 2 | 4 | - | - | - | - | 1 | 134 | - | - | - |
| 2005 | - | - | 11 | 3 | - | 14 | - | - | 36 | 8 | 3 | - | - | 12 | - | - | - |
| 2010 | 2 | - | - | 4 | - | 3 | - | - | 12 | 14 | 1 | - | - | 23 | - | - | 33 |
| 2015 | 8 | - | - | - | - | 132 | - | 2 | 177 | 118 | - | - | - | 10 | 13 | - | - |
| 2020 | 14 | - | 2 | 4 | 7 | 3 | - | 2 | 37 | - | - | - | - | 13 | 1 | - | - |
| 2025 | 5 | 1 | - | 3 | - | 38 | - | - | 159 | - | - | 4 | - | 8 | - | 1 | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2000 | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 1.9 | - | - | - |
| 2005 | - | - | 0.0 | 0.0 | - | 0.4 | - | - | 0.3 | 0.0 | 0.0 | - | - | 0.1 | - | - | - |
| 2010 | 0.0 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.1 | 0.0 | - | - | 0.2 | - | - | 1.6 |
| 2015 | 0.0 | - | - | - | - | 2.6 | - | 0.0 | 3.4 | 3.4 | - | - | - | 0.1 | 0.3 | - | - |
| 2020 | 0.0 | - | 0.0 | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.3 | - | - | - | - | 0.6 | 0.0 | - | - |
| 2025 | 0.0 | 0.0 | - | 0.0 | - | 1.9 | - | - | 2.2 | - | - | 0.0 | - | 0.1 | - | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Schoenocrambe linifolia (flaxleaf plainsmustard) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|
| year | Nested Frequency | | |
| 2000 | 2 | 4 | - |
| 2005 | 1 | - | - |
| 2010 | 9 | - | 1 |
| 2015 | 5 | - | 1 |
| 2020 | 24 | - | - |
| 2025 | 38 | - | - |
| year | Average Cover (%) | | |
| 2000 | 0.0 | 0.0 | - |
| 2005 | 0.0 | - | - |
| 2010 | 0.0 | - | 0.0 |
| 2015 | 0.0 | - | 0.0 |
| 2020 | 0.1 | - | - |
| 2025 | 0.3 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 08C-14.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | - | 1.8 | 0.1 | - | - | - | 0 | 1.8 |
| 2010 | 0 | 2 | 0.2 | - | - | 1.5 | 0.1 | 1.3 |
| 2015 | - | 2.6 | - | - | - | 1.6 | 0.1 | 2.8 |
| 2020 | - | 1.4 | 0.2 | - | - | 10.1 | 0.1 | 4.7 |
| 2025 | - | 2.7 | 0.8 | - | - | 16.5 | - | 9.1 |
| year | Quadrat Cover (%) | | | | | | | |
| 2000 | - | 15.6 | 0.0 | - | 0.0 | 3.9 | 0.2 | 1.7 |
| 2005 | - | 2.7 | 0.0 | - | - | - | 0.2 | 2.7 |
| 2010 | 0.0 | 2.2 | 0.1 | - | - | 1.2 | 0.2 | 3.1 |
| 2015 | 0.0 | 2.0 | 0.0 | 0.0 | - | 1.8 | 0.0 | 2.8 |
| 2020 | - | 2.1 | 0.2 | - | - | 10.1 | 0.1 | 4.5 |
| 2025 | - | 2.8 | 0.4 | 0.0 | - | 15.3 | 0.1 | 9.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-14.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/23 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/17 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2000 | 6500 | - | 2 | 66 | 32 | 51 | 8 | 14 | 32/62 |
| 2005 | 1860 | - | 2 | 9 | 89 | 34 | 65 | 82 | 35/45 |
| 2010 | 1620 | 260 | 25 | 27 | 48 | 51 | 5 | 41 | 30/42 |
| 2015 | 1360 | - | 10 | 59 | 31 | 16 | 56 | 25 | 28/47 |
| 2020 | 1340 | 240 | 19 | 33 | 48 | 25 | 42 | 36 | 25/37 |
| 2025 | 1520 | 40 | 7 | 68 | 25 | 24 | 62 | 25 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2000 | 100 | - | 0 | 100 | 0 | 40 | 0 | 0 | 20/19 |
| 2005 | 120 | - | 17 | 83 | 0 | 33 | 0 | 0 | 34/41 |
| 2010 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/62 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/33 |
| 2020 | 80 | - | 25 | 75 | 0 | 0 | 75 | 0 | 23/39 |
| 2025 | 140 | - | 14 | 86 | 0 | 29 | 0 | 0 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 2000 | 140 | - | 0 | 100 | 0 | 14 | 57 | 0 | 9/12 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/13 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 47/473 |
| 2020 | - | - | - | - | - | - | - | - | 40/58 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2000 | 12660 | 80 | 4 | 93 | 3 | 0 | 0 | 1 | 11/19 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 1300 | - | 15 | 85 | 0 | 0 | 0 | 0 | 21/29 |
| 2015 | 9200 | 240 | 43 | 57 | 0 | 1 | 0 | 0 | 16/15 |
| 2020 | 14540 | - | 3 | 95 | 1 | 2 | 1 | 1 | 18/25 |
| 2025 | 18360 | 460 | 5 | 92 | 3 | 1 | 0 | 3 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 2000 | 320 | - | 0 | 81 | 19 | 63 | 25 | 13 | 8/14 |
| 2005 | 380 | - | 11 | 84 | 5 | 5 | 95 | 0 | 18/19 |
| 2010 | 200 | - | 10 | 90 | 0 | 0 | 0 | 0 | 22/21 |
| 2015 | 180 | - | 56 | 44 | 0 | 0 | 33 | 0 | 14/19 |
| 2020 | 180 | 20 | 0 | 100 | 0 | 11 | 11 | 0 | 16/19 |
| 2025 | 180 | - | 0 | 100 | 0 | 11 | 22 | 0 | - / - |

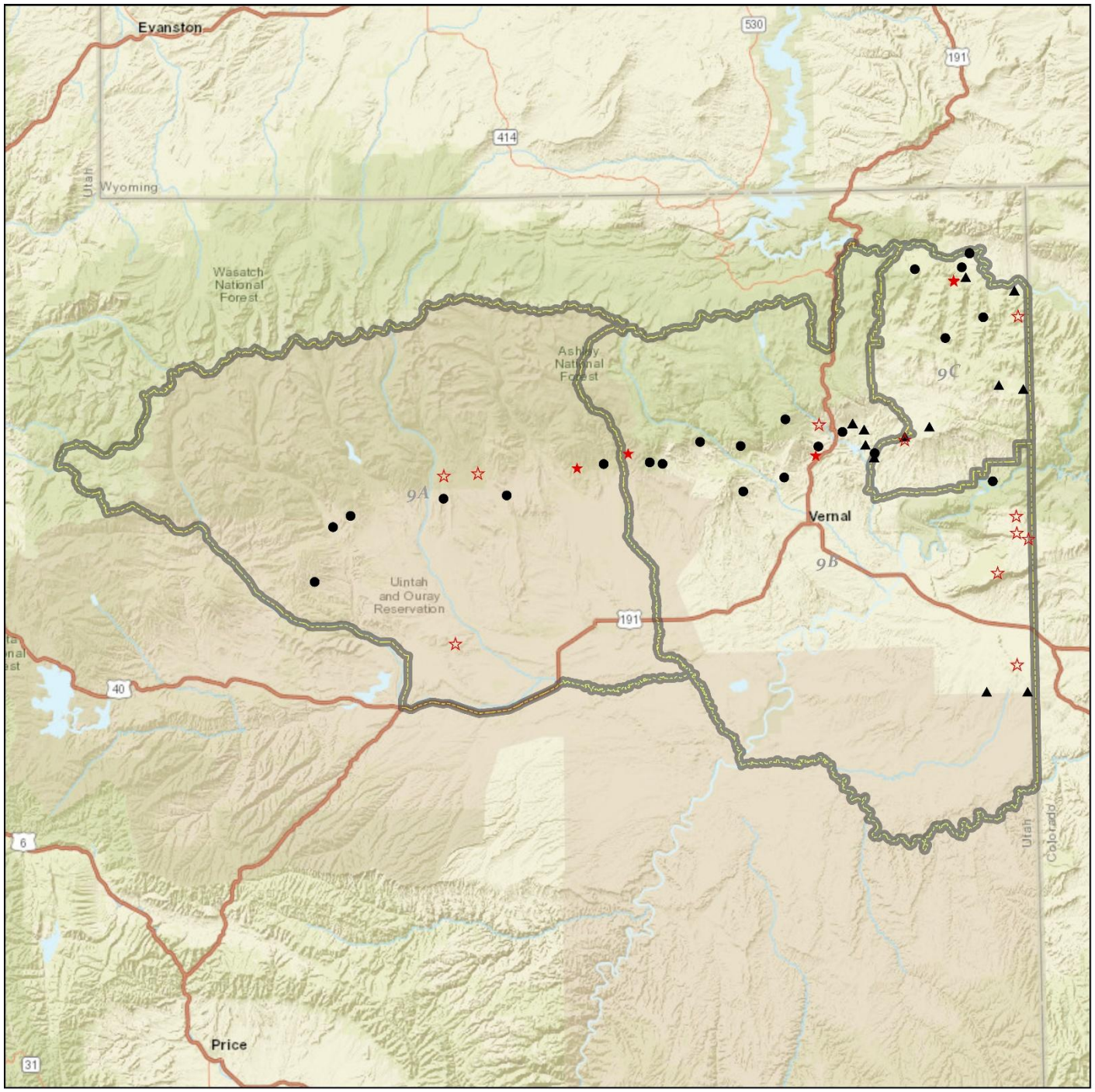
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2000 | 1240 | - | 3 | 84 | 13 | 0 | 0 | 0 | 7/38 |
| 2005 | 2160 | - | 0 | 72 | 28 | 0 | 0 | 3 | 11/41 |
| 2010 | 1620 | 20 | 0 | 88 | 12 | 5 | 0 | 11 | 11/40 |
| 2015 | 2480 | - | 3 | 94 | 2 | 0 | 0 | 2 | 11/34 |
| 2020 | 2360 | 20 | 2 | 98 | 0 | 0 | 0 | 11 | 11/40 |
| 2025 | 4760 | - | 0 | 99 | 0 | 0 | 0 | 0 | - / - |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 54/79 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 08C-14.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

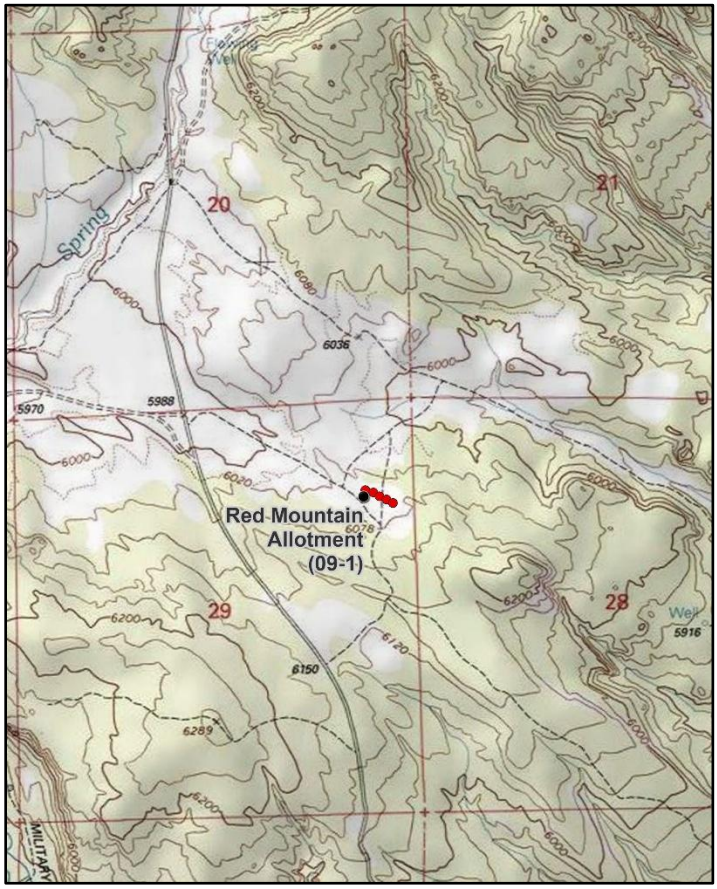
| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2000 | 19.7 | 5.5 | 1.1 | 10.7 | -0.1 | 3.9 | 0.0 | **40.8** | Fair |
| 2005 | 2.3 | 0.0 | 0.0 | 30.0 | 0.0 | 0.4 | 0.0 | **32.7** | Fair |
| 2010 | 2.6 | 0.0 | 0.0 | 30.0 | -2.0 | 0.5 | 0.0 | **31.1** | Fair |
| 2015 | 3.4 | 0.0 | 0.0 | 30.0 | -7.5 | 0.8 | 0.0 | **26.7** | Poor-Fair |
| 2020 | 1.9 | 0.0 | 0.0 | 6.1 | -0.6 | 1.5 | 0.0 | **8.9** | Very Poor-Poor |
| 2025 | 3.4 | 0.0 | 0.0 | 5.6 | -1.4 | 0.8 | 0.0 | **8.4** | Very Poor-Poor |

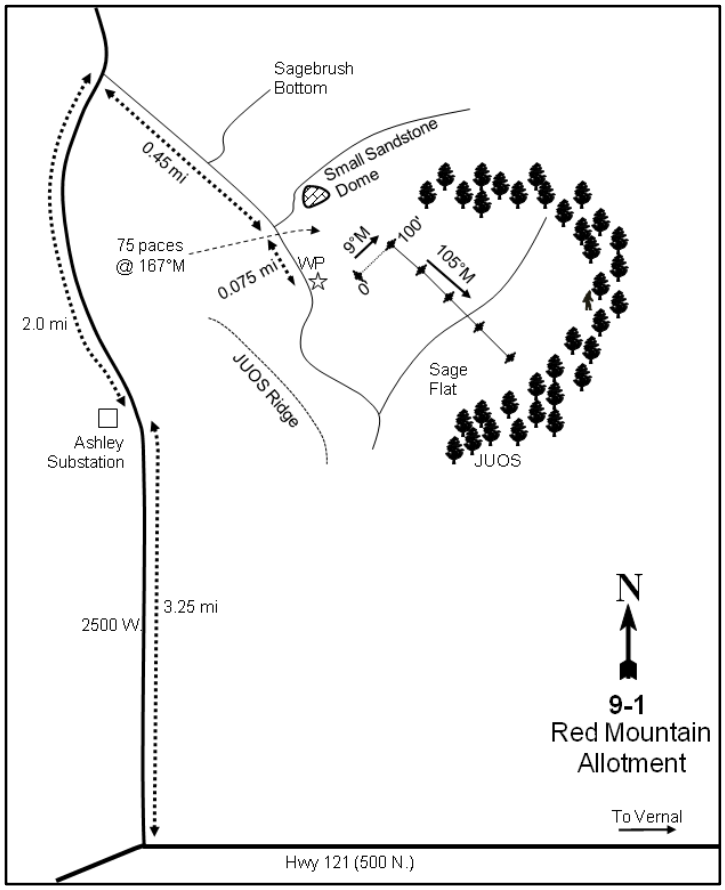
# WILDLIFE MANAGEMENT UNIT 09 – SOUTH SLOPE




Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# RED MOUNTAIN ALLOTMENT - STUDY NO. 09-1




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steinaker Reservoir ; Township 3S, Range 21E, Section 29 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 620329 East 4487869 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 494 |
| Transect Bearing | 23° magnetic (Lines 2-5: 105° magnetic) |
| Length | 500ft |
| Belt Placement | Line 1 (4ft), Line 2 (28ft), Line 3 (45ft), Line 4 (77ft), Line 5 (89ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Highway 121 (500 North) west of Vernal in Maeser, go north on 2500 West for 3.25 miles to the Ashley substation. From there, continue 2.0 miles to a dirt road to the right in the sagebrush bottom. Turn and go east for 0.5 miles to a fork. Stay right and proceed less than 0.1 miles to the witness post on the left (east) side of the road; the 0-foot stake should be visible from the left side of the road. The study can also be located by walking 75 paces at a bearing of 167 degrees magnetic from the east end of the sandstone dome to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SPRING CREEK |
| Elevation | 6,000ft (1,829m) |
| Aspect | Northwest |
| Slope | 2-4% |
| Sample Dates | 08/09/1995, 08/19/2000, 07/19/2005, 07/26/2010, 06/25/2015, 07/06/2020, 06/17/2025 |

**Table 09-01.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Chaining - One-Way Smooth | Taylor Mountain Fire Rehabilitation | 3182 | Fall 2014 | 1100 |
| Hand Crew - Lop and Scatter | Steinaker Draw PJ (CCI) | 28 | September 2005 | 266 |
| Herbicide - Aerial Fixed Wing | 2021-GRD-Herbicide Treatment-Coalmine Basin, Cottonwood | 5721 | August 2021 | 7697 |
| Seeding - Aerial After | Taylor Mountain Fire--BLM ESR Supplement | 3207 | December 2014 | 2019 |
| Fire - Wildfire | Taylor Mountain Road | - | July 2014 | 3147 |

**Table 09-01.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Taylor Mountain fire; drill seed mix | | | Drill | Oct 2014 | 200 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | | 0.50 | 0.00 |
| G | Agropyron cristatum | Crested Wheatgrass | | 1.00 | 0.00 |
| G | Agropyron fragile | Siberian Wheatgrass | | 1.00 | 0.00 |
| F | Medicago sativa | Alfalfa | | 1.00 | 0.00 |
| F | Onobrychis viciifolia | Sainfoin | | 4.00 | 0.00 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Taylor Mountain Fire Sage/Kochia | | | Aerial | Dec 2014 | 2020 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Uintah UT | 1.22 | 0.15 |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Beaver UT | 0.26 | 0.05 |
| S | Bassia prostrata | Forage Kochia | Millard UT | 0.99 | 0.83 |

## Wildlife Habitat and Vegetation History

**Table 09-01.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 09-01.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Wyoming Big Sagebrush | Early Phase I |
| 1988 | Wyoming Big Sagebrush | Early Phase I |
| 1995 | Wyoming Big Sagebrush | Early Phase I |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2010 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2015 | Annual Grass-Forb | No Encroachment |
| 2020 | Perennial Grass | No Encroachment |
| 2025 | Perennial Grass | No Encroachment |

## Site Notes

This study is in the Red Mountain cattle allotment managed by the Bureau of Land Management. A road crosses through line 4 of the transect.

## Soils

**Table 09-01.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.9 | 77.0 | 12.7 | 10.3 | 0.6 | 6.3 | 64.0 | 0.6 | 08/19/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1982-2000 - Current Potential State: Community Phase 2.2<br>2005-2010 - Current Potential State: Community Phase 2.4<br>2015 - Invasive Annuals State: Community Phase 4.1<br>2020-2025 - Seeded State: Community Phase 5.1 |

Between study establishment in 1982 and the 2010 sample year, the dominant plant community on this site was composed of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (Photos, Pre-1992 Data, Table 09-01.12, Table 09-01.13) with a poor herbaceous understory (Table 09-01.7). The introduced annual grass species cheatgrass (*Bromus tectorum*) increased in abundance on the site over the course of the study (Table 09-01.10). The site transitioned to an annual grass/forb community mostly dominated by weedy annual species following a fire in 2014 (Table 09-01.1). However, the perennial grass species crested wheatgrass (*Agropyron cristatum*) increased in 2020 as a result of the fire rehabilitation seeding (Table 09-01.2, Table 09-01.10, Table 09-01.11), and the site has been dominated by perennial grasses since that time.

Deer winter range condition has ranged between very poor and fair since 1995, while generally improving due to increases in perennial grass and a decrease in annual grass cover. In 2025, deer winter range condition was considered to be fair. Further improvement to deer wintering range could be accomplished through efforts that support increased cover and reproduction of preferred browse (Table 09-01.6, Table 09-01.13, Table 09-01.15). Pellet transect data shows that deer presence was high between 1995 and 2010, but it has remained low since 2015 (Table 09-01.9). During the 2024/25 winter season the area just 6 miles north of the study area had concentrated occurrences of collared mule deer, but no occurrences on the site itself (Wildlife Migration Initiative).

## Trend Summary Tables

**Table 09-01.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 21.2 | 4.1 | - | - | - | - |
| 2000 | 20.0 | 2.1 | - | - | - | - |
| 2005 | 14.8 | 0.2 | - | 20.1 | 0.8 | - |
| 2010 | 16.3 | 0.2 | - | 17.6 | 0.6 | - |
| 2015 | - | - | - | - | - | - |
| 2020 | 0.2 | 0.0 | - | 0.1 | 0.3 | - |
| 2025 | 1.4 | 0.8 | - | 0.2 | 0.9 | - |

**Table 09-01.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 408 | 133 | 300 | 69 | 7.5 | 1.7 | 1.7 | 0.3 |
| 2000 | 356 | 99 | 121 | 8 | 7.0 | 1.2 | 0.4 | 0.0 |
| 2005 | 485 | 62 | 170 | 13 | 21.4 | 0.8 | 0.8 | 0.1 |
| 2010 | 405 | 78 | 136 | 9 | 17.6 | 1.6 | 1.6 | 0.2 |
| 2015 | 192 | 180 | 178 | 114 | 17.1 | 4.2 | 21.8 | 3.1 |
| 2020 | 76 | 280 | 163 | 233 | 0.3 | 15.3 | 1.6 | 7.4 |
| 2025 | 15 | 309 | 43 | 13 | 0.1 | 31.7 | 0.1 | 0.0 |

**Table 09-01.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 21.0 | 15.9 | 43.5 | 0.0 | 0.0 | 34.0 |
| 2000 | 25.8 | 18.3 | 43.0 | 0.1 | - | 30.1 |
| 2005 | 16.3 | 14.2 | 44.7 | 0.1 | 0.0 | 37.3 |
| 2010 | 20.7 | 9.7 | 56.5 | - | 0.0 | 36.5 |
| 2015 | 72.9 | 0.0 | 14.4 | 2.0 | 0.0 | 36.2 |
| 2020 | 55.7 | 0.0 | 33.2 | 0.9 | 0.1 | 27.4 |
| 2025 | 46.5 | 0.0 | 32.8 | 0.6 | 0.1 | 35.3 |

**Table 09-01.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | - | 47 | 2 | 14 |
| 2000 | 1 | - | 30 | 1 | 65 |
| 2005 | 1 | - | 29 | 1 | 90 |
| 2010 | - | - | 40 | 2 | 28 |
| 2015 | - | - | 4 | - | 15 |
| 2020 | 16 | - | 18 | - | 10 |
| 2025 | 7 | - | 18 | - | 15 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 0.7 (1.8) | - | 45.6 (112.6) | - | - |
| 2005 | 2.2 (5.4) | 8.7 (21.5)* | 59.0 (145.7) | - | - |
| 2010 | - | - | 65.0 (160.6) | 6.0 (14.9) | - |
| 2015 | - | - | 8.7 (21.5) | - | - |
| 2020 | 42.1 (104.0) | - | 12.8 (31.5) | - | - |
| 2025 | 15.3 (37.7) | - | 10.0 (24.8) | 2.7 (6.6) | - |

*Pellets per acre (ha)

**Table 09-01.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus briziformis[ai] (rattlesnake brome) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | - | - | - | 294 | 26 | 61 | 3 | 53 | 18 | - | 290 |
| 2000 | - | - | - | 345 | 4 | 16 | 2 | 47 | 52 | - | 35 |
| 2005 | - | - | - | 476 | 10 | 16 | 5 | 25 | 16 | - | 292 |
| 2010 | 4 | - | - | 405 | 2 | 4 | 11 | 7 | 56 | - | - |
| 2015 | 85 | 56 | 5 | 160 | - | 26 | 5 | - | 30 | 4 | 50 |
| 2020 | 55 | 217 | 2 | 60 | 3 | 37 | 5 | - | 20 | 22 | 31 |
| 2025 | 8 | 285 | - | 6 | - | - | 4 | - | 27 | 14 | 9 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | 5.6 | 0.2 | 0.3 | 0.1 | 0.7 | 0.4 | - | 1.8 |
| 2000 | - | - | - | 6.9 | 0.0 | 0.1 | 0.0 | 0.4 | 0.6 | - | 0.1 |
| 2005 | - | - | - | 19.1 | 0.1 | 0.1 | 0.0 | 0.5 | 0.1 | - | 2.3 |
| 2010 | 0.0 | - | - | 17.6 | 0.0 | 0.0 | 0.1 | 0.2 | 1.2 | - | - |
| 2015 | 1.8 | 0.9 | 0.0 | 16.6 | - | 0.5 | 0.4 | - | 0.5 | 0.0 | 0.5 |
| 2020 | 1.8 | 12.8 | 0.0 | 0.2 | 0.1 | 0.2 | 0.2 | - | 0.2 | 0.2 | 0.1 |
| 2025 | 0.2 | 29.9 | - | 0.0 | - | - | 0.6 | - | 0.6 | 0.4 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-01.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Astragalus (milkvetch) | Calochortus nuttallii (sego lily) | Chaenactis (pincushion) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cleome serrulata[a] (Rocky Mountain beeplant) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha (cryptantha) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 11 | - | 4 | - | 2 | 2 | 17 | - | 3 | 18 | - | 103 | - | 8 | 2 | 16 |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | 7 |
| 2005 | - | - | - | - | 2 | 2 | - | - | - | 8 | 7 | - | 11 | - | 2 | - | - |
| 2010 | - | - | - | - | - | - | - | - | - | - | 1 | - | 4 | - | - | - | 2 |
| 2015 | 1 | - | 25 | - | - | 2 | - | - | 22 | - | - | 11 | 60 | 1 | - | - | 8 |
| 2020 | 1 | - | 81 | - | - | - | - | - | - | - | - | 7 | 27 | - | 19 | - | - |
| 2025 | - | - | - | - | - | - | - | - | - | 1 | - | - | 7 | - | - | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 | - | 0.3 | - | 0.0 | 0.0 | 0.0 |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | 0.0 |
| 2005 | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.1 | - | 0.0 | - | - |
| 2010 | - | - | - | - | - | - | - | - | - | - | 0.1 | - | 0.0 | - | - | - | 0.0 |
| 2015 | 0.0 | - | 2.0 | - | - | 0.0 | - | - | 2.2 | - | - | 0.2 | 8.2 | 0.0 | - | - | 0.7 |
| 2020 | 0.0 | - | 0.3 | - | - | - | - | - | - | - | - | 0.0 | 0.1 | - | 0.1 | - | - |
| 2025 | - | - | - | - | - | - | - | - | - | 0.0 | - | - | 0.0 | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Ipomopsis congesta (ballhead ipomopsis) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Oenothera pallida[a] (pale evening primrose) | Packera multilobata (lobeleaf groundsel) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Sanguisorba minor[i] (small burnet) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Sphaeralcea parvifolia (smallflower globemallow) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 3 | 13 | - | 18 | 1 | - | 12 | 236 | 2 | - | - | 6 | - | - | - |
| 2000 | - | - | 3 | 12 | - | - | - | 0 | - | 102 | - | - | - | 6 | - | - | - |
| 2005 | - | - | 23 | - | - | - | - | - | 1 | 157 | - | - | - | - | - | - | - |
| 2010 | - | - | 94 | 12 | - | - | - | - | 5 | 71 | - | 1 | - | 3 | 1 | - | - |
| 2015 | 5 | 0 | 49 | 2 | 9 | 17 | 16 | 7 | 17 | 67 | - | 8 | 50 | - | 3 | 4 | 12 |
| 2020 | 1 | - | 21 | 1 | - | 229 | - | 2 | 18 | 85 | - | 40 | - | - | 1 | 5 | - |
| 2025 | - | - | 10 | - | - | - | - | - | 13 | 27 | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.0 | 0.1 | - | 0.0 | 0.0 | - | 0.1 | 1.2 | 0.0 | - | - | 0.0 | - | - | - |
| 2000 | - | - | 0.0 | 0.1 | - | - | - | 0.0 | - | 0.3 | - | - | - | 0.0 | - | - | - |
| 2005 | - | - | 0.1 | - | - | - | - | - | 0.0 | 0.6 | - | - | - | - | - | - | - |
| 2010 | - | - | 1.2 | 0.0 | - | - | - | - | 0.0 | 0.3 | - | 0.0 | - | 0.0 | 0.0 | - | - |
| 2015 | 0.0 | 0.0 | 4.0 | 0.4 | 0.2 | 1.2 | 1.5 | 0.2 | 0.1 | 2.0 | - | 0.0 | 0.2 | - | 0.6 | 0.1 | 1.0 |
| 2020 | 0.0 | - | 0.1 | 0.0 | - | 7.2 | - | 0.0 | 0.1 | 0.3 | - | 0.7 | - | - | 0.0 | 0.0 | - |
| 2025 | - | - | 0.0 | - | - | - | - | - | 0.0 | 0.1 | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) |
|---|---|---|
| year | Nested | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | - | - |
| 2010 | - | - |
| 2015 | - | 4 |
| 2020 | 3 | - |
| 2025 | - | - |
| year | Average Cover (%) | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | - | - |
| 2010 | - | - |
| 2015 | - | 0.0 |
| 2020 | 0.1 | - |
| 2025 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-01.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Bassia prostrata[pi] (forage kochia) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Linanthus pungens (granite prickly phlox) | Opuntia (pricklypear) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 20.1 | - | - | - | 0.8 | - | - | - |
| 2010 | 17.6 | - | - | - | 0.4 | - | - | 0.2 |
| 2015 | - | - | - | - | - | - | - | - |
| 2020 | - | 0.1 | - | - | 0.3 | - | - | - |
| 2025 | - | - | 0.2 | 0.3 | 0.6 | - | - | - |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | 21.2 | - | - | - | 4.0 | - | 0.1 | - |
| 2000 | 20.0 | - | - | - | 2.1 | - | - | - |
| 2005 | 14.8 | - | - | - | 0.2 | - | - | 0.0 |
| 2010 | 16.3 | - | - | - | 0.0 | - | - | 0.2 |
| 2015 | - | - | - | - | - | - | - | - |
| 2020 | 0.0 | 0.1 | - | - | 0.0 | - | - | - |
| 2025 | - | 0.8 | 0.6 | 0.0 | 0.8 | 0.0 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-01.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 4360 | 120 | 8 | 77 | 15 | 39 | 8 | 6 | 83/107 |
| 2000 | 5440 | 40 | 1 | 34 | 65 | 28 | 3 | 25 | 74/78 |
| 2005 | 4360 | 3280 | 12 | 26 | 62 | 9 | 30 | 30 | 92/94 |
| 2010 | 3080 | - | 3 | 65 | 32 | 34 | 1 | 29 | 88/106 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 42/42 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 70/59 |
| 2025 | - | - | - | - | - | - | - | - | - / - |
| Bassia prostrata[pi] -- (forage kochia) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 20/58 |
| 2025 | 100 | - | 0 | 60 | 40 | 20 | 20 | 20 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 1000 | - | 6 | 86 | 8 | 0 | 0 | 2 | 60/81 |
| 2000 | 1020 | 20 | 8 | 65 | 28 | 0 | 0 | 12 | 46/56 |
| 2005 | 320 | 40 | 13 | 63 | 25 | 0 | 0 | 6 | 46/48 |
| 2010 | 120 | - | 0 | 50 | 50 | 0 | 0 | 50 | 49/65 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 48/73 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 55/86 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

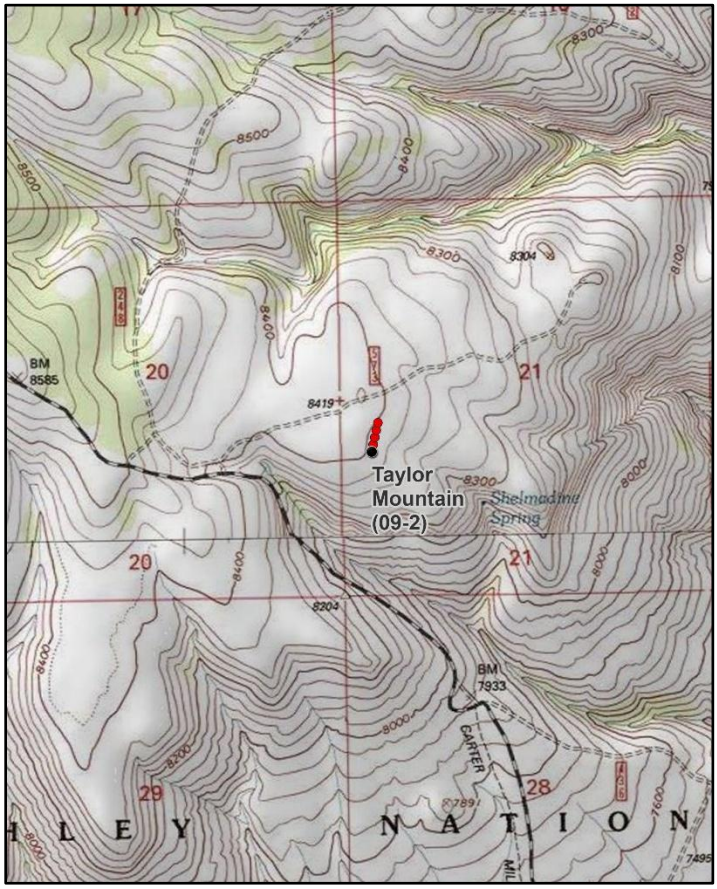
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 30/58 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/14 |
| 2020 | - | - | - | - | - | - | - | - | 27/34 |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/48 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 40 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 10/34 |
| 2000 | 100 | - | 0 | 60 | 40 | 0 | 0 | 0 | 7/19 |
| 2005 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 13/16 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/33 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia stansburiana[p] -- (Stansbury cliffrose) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 76/104 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 110/171 |

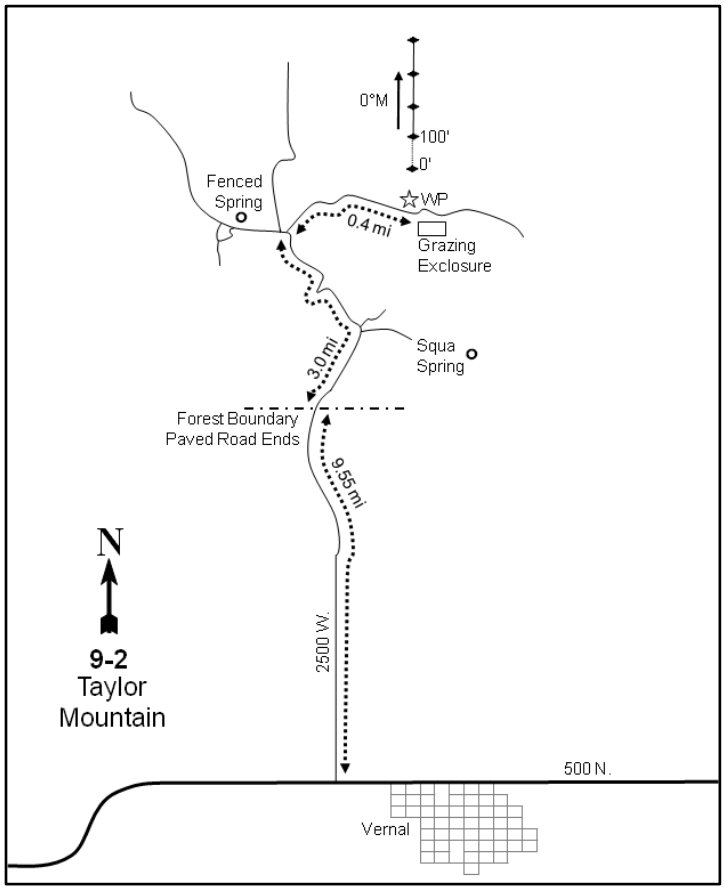
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-01.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 26.4 | 10.6 | 4.1 | 3.4 | -5.6 | 0.5 | 0.0 | **39.4** | Fair |
| 2000 | 25.0 | -4.5 | 0.6 | 2.3 | -5.2 | 0.0 | 0.0 | **18.2** | Poor |
| 2005 | 25.1 | -3.7 | 5.8 | 1.7 | -16.1 | 0.1 | 0.0 | **12.9** | Poor |
| 2010 | 22.0 | 5.5 | 1.6 | 3.2 | -13.2 | 0.3 | 0.0 | **19.4** | Poor |
| 2015 | 0.0 | 0.0 | 0.0 | 8.4 | -12.8 | 6.2 | 0.0 | **1.8** | Very Poor |
| 2020 | 0.1 | 0.0 | 0.0 | 30.0 | -0.3 | 10.0 | 0.0 | **39.8** | Fair |
| 2025 | 0.3 | 0.0 | 0.0 | 30.0 | 0.0 | 0.1 | 0.0 | **30.4** | Fair |

# TAYLOR MOUNTAIN - STUDY NO. 09-2




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Dyer Mountain SW; Township 2S, Range 21E, Section 21 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 620520 East 4498442 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7091 |
| Transect Bearing | 0° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (14ft & 82ft), Line 2 (28ft), Line 3 (59ft), Line 4 (77ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from Vernal, travel west on 500 North Street to 2500 West. Turn right on 2500 West and drive north for 9.5 miles to the National Forest boundary. Continue driving north for 3 miles to a fork. Turn right and go 0.4 miles toward the Taylor Mountain Exclosure. From the sign on the west side of the exclosure, walk 54 paces north to the 0-foot end of the baseline. The 0-foot stake is marked by an 18-inch tall fence post with browse tag #7091; there is also a witness post 4 feet south of the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | TAYLOR MTN-OAKS PARK |
| Elevation | 8,400ft (2,560m) |
| Aspect | East |
| Slope | 3% |
| Sample Dates | 08/09/1995, 07/19/2000, 07/20/2005, 07/29/2010, 07/08/2015, 07/07/2020, 06/17/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-02.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 09-02.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | No Encroachment |
| 1988 | Mountain Big Sagebrush | No Encroachment |
| 1995 | Mountain Big Sagebrush | No Encroachment |
| 2000 | Mountain Big Sagebrush | No Encroachment |
| 2005 | Mountain Big Sagebrush | No Encroachment |
| 2010 | Mountain Big Sagebrush | No Encroachment |
| 2015 | Mountain Big Sagebrush/Antelope Bitterbrush | No Encroachment |
| 2020 | Mountain Big Sagebrush/Antelope Bitterbrush | No Encroachment |
| 2025 | Mountain Big Sagebrush/Antelope Bitterbrush | No Encroachment |

## Site Notes

The study is within the Taylor Mountain Complex allotment which is managed by the U.S. Forest Service using a six-pasture rest--rotation system. The area is on the border of crucial summer range and winter range for both deer and elk, and is likely used during both seasons.

## Soils

**Table 09-02.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.2 | 37.4 | 36.0 | 26.6 | 5.0 | 4.5 | 153.6 | 1.3 | 07/19/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 21 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1982, the plant community on this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) as the dominant plant species (Photos, Pre-1992 Data, Table 09-02.12, Table 09-02.13). The herbaceous understory has remained diverse and abundant over the sample years. The herbaceous component has been primarily composed of perennial grasses and forbs in most sample years, but perennial forbs contributed most of the herbaceous cover in 2025 (Table 09-02.7, Table 09-02.10, Table 09-02.11). This site will likely remain in this state unless a major disturbance occurs that removes the shrub component from the community.

The abundant grass and forb communities on this site may provide forage for elk and deer during the summer months. Furthermore, the robust browse component would likely be valuable should the area be used by wintering big game (Table 09-02.3, Table 09-02.6, Table 09-02.7). Pellet transect data indicates that elk presence has remained low since 2000, but presence of mule deer has been moderate to high over the same time period (Table 09-02.9). Although the area is currently mapped as summer range for both species, during the 2024/25 winter season the the study area had concentrated occurrences of collared mule deer (Wildlife Migration Initiative). Utilization of preferred browse has generally been high throughout the study period; over 50% of mountain big sagebrush plants and more than 75% of antelope bitterbrush plants sampled in density strips have been moderately to heavily utilized in most sample years since 1995 (Table 09-02.13).

## Trend Summary Tables

**Table 09-02.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 37.9 | 0.6 | - | - | - | - |
| 2000 | 39.4 | 1.2 | - | - | - | - |
| 2005 | 39.0 | 1.1 | - | 48.8 | 0.7 | - |
| 2010 | 40.9 | 0.6 | - | 53.7 | 1.0 | - |
| 2015 | 30.1 | 1.0 | - | 40.0 | 1.0 | - |
| 2020 | 39.2 | 1.0 | - | 43.7 | 1.2 | - |
| 2025 | 36.6 | 1.5 | - | 44.7 | 1.1 | - |

**Table 09-02.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 3 | 383 | 249 | 393 | 0.0 | 6.6 | 0.8 | 12.2 |
| 2000 | - | 391 | 42 | 360 | - | 12.7 | 0.2 | 17.1 |
| 2005 | - | 292 | 248 | 354 | - | 6.2 | 1.7 | 19.7 |
| 2010 | - | 344 | 57 | 295 | - | 9.7 | 0.3 | 13.9 |
| 2015 | 2 | 386 | 78 | 315 | 0.0 | 24.6 | 1.0 | 15.0 |
| 2020 | - | 355 | 258 | 344 | - | 14.0 | 2.3 | 15.1 |
| 2025 | 4 | 354 | 179 | 383 | 0.1 | 14.0 | 3.5 | 26.9 |

**Table 09-02.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 6.4 | 1.9 | 64.8 | 2.7 | 0.6 | 50.1 |
| 2000 | 7.7 | 1.2 | 71.5 | 1.9 | 0.1 | 61.6 |
| 2005 | 7.7 | 0.1 | 53.5 | 1.6 | 0.1 | 55.0 |
| 2010 | 9.5 | 0.1 | 72.6 | 0.9 | 0.6 | 57.3 |
| 2015 | 8.3 | 0.0 | 63.5 | 0.4 | 0.0 | 58.6 |
| 2020 | 8.3 | 0.1 | 62.2 | 1.1 | 0.1 | 61.5 |
| 2025 | 4.9 | 0.0 | 47.7 | 1.1 | 0.2 | 68.2 |

**Table 09-02.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | 3 | 21 | 8 | - | 2 |
| 2000 | - | - | 20 | 3 | - | 6 |
| 2005 | - | 10 | 25 | 8 | - | 33 |
| 2010 | - | 9 | 28 | 7 | 5 | 7 |
| 2015 | - | 13 | 27 | 5 | 2 | 10 |
| 2020 | - | 7 | 27 | - | 1 | 6 |
| 2025 | - | - | 28 | 9 | 4 | 9 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 0.7 (1.7) | 3.6 (9.0) | 35.5 (87.7) | 15.4 (38.1) | - | - |
| 2005 | - | 16.0 (39.5) | 66.4 (163.9) | 2.7 (6.6) | - | - |
| 2010 | - | 25.4 (62.8) | 63.7 (157.3) | 9.4 (23.2) | 122.0 (301.3)* | - |
| 2015 | - | 38.5 (95.0) | 36.8 (91.0) | 17.4 (43.0) | 8.7 (21.5)* | - |
| 2020 | - | 37.0 (91.5) | 28.8 (71.2) | 9.4 (23.2) | 52.3 (129.1)* | - |
| 2025 | - | 2.9 (7.2) | 44.9 (110.9) | 6.0 (14.9) | 34.9 (86.1)* | - |

*Pellets per acre (ha)

**Table 09-02.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bouteloua gracilis (blue grama) | Bromus porteri (Porter brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1995 | - | 57 | 3 | - | 3 | 7 | - | 122 | 171 | 19 | 54 | 21 | 174 | 57 | 1 | 2 |
| 2000 | - | 31 | - | 17 | - | 22 | - | 42 | 197 | 15 | 35 | 6 | 234 | 14 | 21 | 7 |
| 2005 | - | 37 | - | 8 | - | 8 | - | 40 | 74 | 6 | 63 | 2 | 93 | 97 | 29 | 1 |
| 2010 | - | 5 | 1 | 12 | - | 36 | - | 12 | 96 | 14 | 9 | 2 | 210 | 74 | 26 | 0 |
| 2015 | 3 | 29 | - | 1 | 2 | 64 | - | 43 | 143 | 6 | 55 | 15 | 125 | 169 | 59 | 13 |
| 2020 | 3 | 77 | - | 10 | - | 33 | - | 49 | 130 | 1 | 97 | 33 | 105 | 90 | 42 | 2 |
| 2025 | - | 26 | - | 5 | 4 | 87 | 30 | 12 | 165 | 4 | 92 | 29 | 61 | 43 | 49 | 7 |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | 0.4 | 0.0 | - | 0.0 | 0.0 | - | 1.6 | 1.1 | 0.1 | 0.3 | 0.1 | 2.0 | 1.0 | 0.0 | 0.0 |
| 2000 | - | 0.6 | - | 0.5 | - | 0.4 | - | 0.7 | 2.0 | 0.2 | 0.6 | 0.1 | 7.1 | 0.3 | 0.2 | 0.1 |
| 2005 | - | 0.4 | - | 0.2 | - | 0.0 | - | 1.0 | 0.4 | 0.1 | 1.0 | 0.0 | 1.5 | 1.3 | 0.2 | 0.0 |
| 2010 | - | 0.1 | 0.0 | 0.1 | - | 1.1 | - | 0.1 | 0.9 | 0.2 | 0.6 | 0.0 | 4.5 | 1.9 | 0.3 | 0.0 |
| 2015 | 0.0 | 0.6 | - | 0.1 | 0.0 | 2.8 | - | 1.6 | 2.5 | 0.1 | 2.4 | 0.4 | 5.6 | 7.0 | 1.1 | 0.4 |
| 2020 | 0.0 | 1.3 | - | 0.1 | - | 0.2 | - | 0.6 | 2.5 | 0.0 | 3.4 | 0.5 | 3.0 | 1.4 | 1.0 | 0.1 |
| 2025 | - | 1.0 | - | 0.2 | 0.1 | 3.3 | 0.8 | 0.1 | 1.7 | 0.0 | 2.4 | 0.4 | 2.3 | 1.1 | 0.8 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-02.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Arabis holboellii[a] (Holboell's rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (looseflower milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chenopodium[a] (goosefoot) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 4 | - | 22 | 63 | - | - | - | 16 | - | 250 | 2 | 6 | 7 | 75 | 2 | 15 | - |
| 2000 | 9 | - | 2 | 56 | - | - | - | 9 | - | 245 | 6 | 3 | 1 | 89 | 5 | 6 | - |
| 2005 | 6 | - | - | 47 | - | - | - | 2 | - | 194 | - | - | - | 80 | 4 | 1 | - |
| 2010 | 6 | - | - | 46 | - | - | - | - | - | 112 | - | 4 | - | 38 | - | - | - |
| 2015 | 11 | - | 55 | 29 | - | - | - | 8 | - | 131 | - | - | - | 48 | - | 1 | - |
| 2020 | 5 | - | - | 43 | - | - | - | 3 | - | 96 | - | - | - | 32 | - | - | - |
| 2025 | 45 | 25 | 31 | - | 11 | 20 | 10 | - | 1 | 87 | - | 2 | - | 93 | - | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.0 | 1.7 | - | - | - | 0.1 | - | 2.6 | 0.0 | 0.0 | 0.1 | 0.7 | 0.0 | 0.0 | - |
| 2000 | 0.1 | - | 0.0 | 1.0 | - | - | - | 0.0 | - | 5.0 | 0.0 | 0.2 | 0.0 | 1.4 | 0.0 | 0.1 | - |
| 2005 | 0.2 | - | - | 0.8 | - | - | - | 0.0 | - | 4.3 | - | - | - | 1.7 | 0.0 | 0.0 | - |
| 2010 | 0.0 | - | - | 1.5 | - | - | - | - | - | 2.0 | - | 0.0 | - | 1.1 | - | - | - |
| 2015 | 0.0 | - | 0.8 | 1.3 | - | - | - | 0.0 | - | 0.9 | - | - | - | 0.6 | - | 0.0 | - |
| 2020 | 0.0 | - | - | 0.9 | - | - | - | 0.0 | - | 1.0 | - | - | - | 1.1 | - | - | - |
| 2025 | 0.4 | 0.0 | 0.2 | - | 0.2 | 0.6 | 0.2 | - | 0.0 | 1.1 | - | 0.0 | - | 3.3 | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 3 | 83 | 74 | 4 | 19 | 1 | - | - | - | 1 | 43 | - | - | 1 | - | 67 | 3 |
| 2000 | - | 27 | 12 | 12 | 11 | - | - | - | - | 4 | 51 | 1 | 5 | - | 3 | 39 | - |
| 2005 | - | 212 | 53 | 1 | - | - | - | - | 1 | 1 | 26 | 2 | 23 | 1 | - | 42 | 2 |
| 2010 | - | 4 | 11 | 4 | 2 | - | 2 | - | - | 22 | 24 | - | - | 2 | - | 47 | - |
| 2015 | - | 34 | - | - | 5 | 3 | 5 | - | - | 3 | 14 | 10 | 1 | - | - | 26 | - |
| 2020 | - | 165 | 64 | 1 | 13 | - | 42 | - | - | - | 11 | - | - | 5 | - | 22 | - |
| 2025 | - | 38 | 3 | 2 | 7 | - | 57 | 28 | - | - | 41 | - | 2 | - | - | 29 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.2 | 0.2 | 0.0 | 1.1 | 0.0 | - | - | - | 0.0 | 0.1 | - | - | 0.0 | - | 0.8 | 0.0 |
| 2000 | - | 0.1 | 0.1 | 0.0 | 0.1 | - | - | - | - | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.8 | - |
| 2005 | - | 1.3 | 0.1 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.6 | 0.0 |
| 2010 | - | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | - | - | 0.1 | 0.1 | - | - | 0.0 | - | 0.6 | - |
| 2015 | - | 0.1 | - | - | 0.1 | 0.0 | 0.0 | - | - | 0.0 | 0.1 | 0.0 | 0.0 | - | - | 0.6 | - |
| 2020 | - | 0.8 | 0.2 | 0.0 | 0.2 | - | 0.7 | - | - | - | 0.1 | - | - | 0.1 | - | 0.3 | - |
| 2025 | - | 0.1 | 0.0 | 0.0 | 0.3 | - | 0.7 | 0.2 | - | - | 0.6 | - | 0.0 | - | - | 0.3 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Hydrophyllum capitatum (ballhead waterleaf) | Ipomopsis aggregata (scarlet gilia) | Lactuca serriola[ai] (prickly lettuce) | Lepidium[a] (pepperweed) | Lithospermum (stoneseed) | Lomatium triternatum (nineleaf biscuitroot) | Lupinus argenteus (silvery lupine) | Mertensia lanceolata (prairie bluebells) | Microsteris gracilis[a] (slender phlox) | Packera debilis (weak groundsel) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Penstemon strictus (Rocky Mountain penstemon) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 5 | - | - | 1 | 19 | 85 | 8 | - | 35 | 2 | 10 | 43 | - | 61 | 24 | 69 |
| 2000 | - | - | - | - | - | 17 | 87 | - | - | 20 | 4 | - | 14 | - | 38 | 41 | 85 |
| 2005 | - | - | - | - | 17 | 41 | 88 | 5 | 1 | 65 | 7 | 12 | 14 | - | 27 | 119 | 39 |
| 2010 | - | 2 | 14 | 6 | 3 | 13 | 75 | 1 | - | 13 | - | 4 | 14 | - | 17 | 98 | 46 |
| 2015 | - | - | - | - | - | 3 | 77 | 24 | - | - | 9 | 3 | 34 | - | 26 | 115 | 46 |
| 2020 | 2 | - | - | 2 | - | 46 | 52 | 25 | - | - | - | - | 37 | - | 25 | 134 | 85 |
| 2025 | 6 | - | - | 3 | - | 67 | 47 | 91 | - | - | - | - | 12 | 16 | 12 | 115 | 188 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | - | 0.0 | 0.1 | 1.8 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.1 | - | 1.1 | 0.1 | 0.3 |
| 2000 | - | - | - | - | - | 0.1 | 2.4 | - | - | 0.2 | 0.0 | - | 0.1 | - | 1.1 | 1.2 | 1.3 |
| 2005 | - | - | - | - | 0.1 | 0.3 | 4.5 | 0.0 | 0.0 | 0.8 | 0.1 | 0.1 | 0.1 | - | 0.7 | 2.4 | 0.1 |
| 2010 | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 3.6 | 0.0 | - | 0.3 | - | 0.0 | 0.1 | - | 0.5 | 2.1 | 0.5 |
| 2015 | - | - | - | - | - | 0.0 | 4.3 | 0.2 | - | - | 0.1 | 0.0 | 0.4 | - | 1.0 | 2.2 | 0.2 |
| 2020 | 0.0 | - | - | 0.0 | - | 0.4 | 1.4 | 0.1 | - | - | - | - | 0.2 | - | 1.3 | 2.1 | 0.9 |
| 2025 | 0.4 | - | - | 0.0 | - | 0.7 | 1.0 | 1.1 | - | - | - | - | 0.1 | 0.1 | 0.5 | 4.0 | 3.7 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Streptanthus cordatus (heartleaf twistflower) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Trifolium gymnocarpon (hollyleaf clover) | unknown annual forb[a] (unknown forb) | unknown perennial forb (unknown forb) | Zigadenus elegans (mountain deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | 5 | 188 | 30 | 55 | - | - | 5 | 17 | 36 | 4 | 145 | 10 | - | 14 |
| 2000 | 5 | 3 | 24 | 18 | - | - | - | 16 | 17 | - | 121 | - | - | 11 |
| 2005 | 3 | 107 | 10 | 1 | - | 9 | - | 2 | 17 | - | 149 | - | 38 | 17 |
| 2010 | - | 7 | 26 | 4 | - | 6 | 3 | 8 | 23 | - | 97 | - | - | 5 |
| 2015 | 11 | 0 | 28 | 4 | - | 8 | 1 | 26 | 61 | 1 | 135 | - | - | 15 |
| 2020 | - | 156 | 26 | 3 | 43 | 5 | - | - | 90 | - | 167 | - | - | 3 |
| 2025 | 11 | 55 | 27 | 1 | 120 | 4 | - | - | 44 | 1 | 188 | - | - | 73 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.4 | 0.1 | 0.3 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.5 | 0.0 | - | 0.1 |
| 2000 | 0.0 | 0.0 | 0.1 | 0.1 | - | - | - | 0.1 | 0.1 | - | 1.1 | - | - | 0.2 |
| 2005 | 0.0 | 0.3 | 0.1 | 0.0 | - | 0.0 | - | 0.0 | 0.1 | - | 2.1 | - | 0.2 | 0.2 |
| 2010 | - | 0.0 | 0.3 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.8 | - | - | 0.1 |
| 2015 | 0.2 | 0.0 | 0.3 | 0.0 | - | 0.0 | 0.0 | 0.2 | 0.3 | 0.0 | 1.5 | - | - | 0.1 |
| 2020 | - | 0.9 | 0.2 | 0.0 | 0.4 | 0.0 | - | - | 1.0 | - | 2.9 | - | - | 0.0 |
| 2025 | 0.0 | 0.2 | 0.5 | 0.0 | 3.0 | 0.0 | - | - | 0.6 | 0.0 | 5.0 | - | - | 1.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-02.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2005 | 0.1 | 29.8 | 0.2 | 0.7 | 17.2 | 1.5 |
| 2010 | 0.2 | 31.4 | 0.2 | 1 | 19.8 | 2.1 |
| 2015 | 0.6 | 18.5 | 0.4 | 1 | 16.5 | 4 |
| 2020 | 0.6 | 19.7 | 0.4 | 1.2 | 19.5 | 3.5 |
| 2025 | 1.1 | 18.8 | 0.4 | 1.1 | 20.8 | 3.6 |
| year | Quadrat Cover (%) | | | | | |
| 1995 | 0.0 | 22.5 | 0.1 | 0.6 | 14.6 | 0.6 |
| 2000 | 0.1 | 25.9 | 0.4 | 1.2 | 11.5 | 1.5 |
| 2005 | 0.4 | 25.3 | 0.0 | 1.1 | 11.7 | 1.6 |
| 2010 | 0.6 | 24.3 | 0.1 | 0.6 | 14.1 | 1.6 |
| 2015 | 0.6 | 16.1 | 0.1 | 1.0 | 11.9 | 1.3 |
| 2020 | 0.1 | 18.5 | 0.4 | 1.0 | 15.8 | 4.3 |
| 2025 | 0.1 | 17.4 | 0.4 | 1.5 | 15.7 | 2.9 |

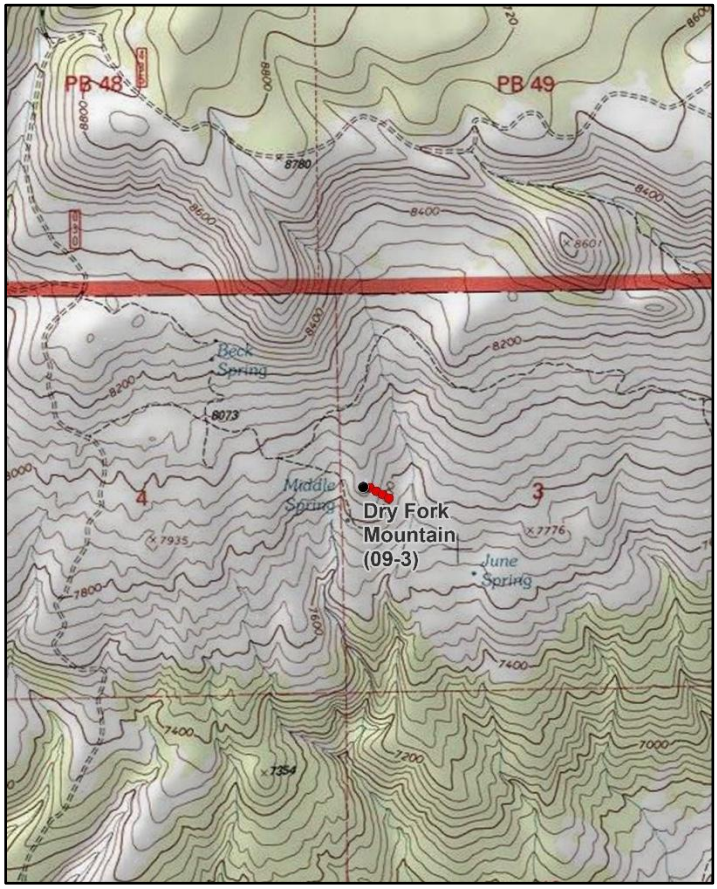
t - Tree Species; p - Preferred Browse; i - Introduced Species

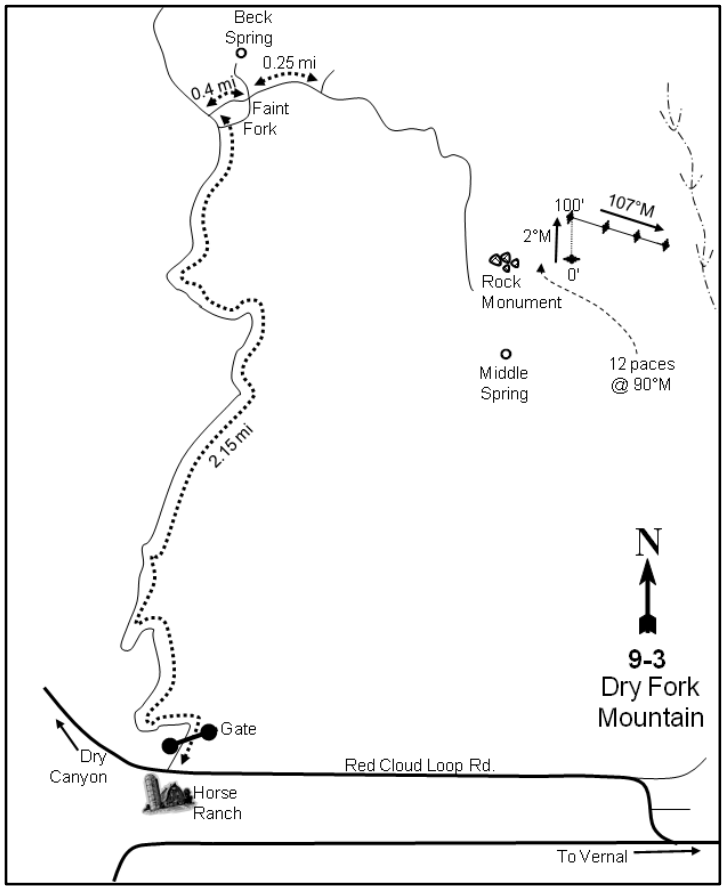
**Table 09-02.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 78/110 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 77/71 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 48/80 |
| 2010 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 49/97 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 59/89 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 62/90 |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 4620 | 180 | 8 | 87 | 4 | 72 | 12 | 0 | 61/100 |
| 2000 | 5120 | 40 | 4 | 74 | 22 | 10 | 0 | 6 | 70/95 |
| 2005 | 4300 | - | 5 | 68 | 27 | 34 | 27 | 10 | 74/101 |
| 2010 | 3700 | 200 | 3 | 87 | 10 | 60 | 10 | 13 | 78/120 |
| 2015 | 4100 | 100 | 2 | 67 | 31 | 32 | 39 | 29 | 72/78 |
| 2020 | 3360 | 80 | 1 | 71 | 28 | 5 | 18 | 32 | 62/90 |
| 2025 | 5200 | 1780 | 40 | 45 | 16 | 48 | 19 | 16 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 81/103 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 68/88 |
| 2005 | 60 | - | 0 | 0 | 100 | 33 | 67 | 0 | 74/85 |
| 2010 | 60 | - | 0 | 100 | 0 | 33 | 67 | 0 | 65/106 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 26/78 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 76/123 |
| 2025 | 60 | - | 0 | 100 | 0 | 33 | 67 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 600 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/34 |
| 2000 | 580 | - | 0 | 100 | 0 | 0 | 3 | 0 | 37/39 |
| 2005 | 500 | 40 | 4 | 92 | 4 | 16 | 0 | 0 | 34/41 |
| 2010 | 320 | - | 0 | 94 | 6 | 6 | 19 | 13 | 37/39 |
| 2015 | 560 | - | 7 | 93 | 0 | 21 | 50 | 0 | 33/42 |
| 2020 | 520 | - | 12 | 89 | 0 | 19 | 4 | 8 | 34/47 |
| 2025 | 640 | - | 0 | 100 | 0 | 3 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 2620 | - | 12 | 86 | 3 | 57 | 36 | 2 | 40/106 |
| 2000 | 2500 | - | 9 | 61 | 30 | 23 | 52 | 14 | 41/90 |
| 2005 | 2320 | - | 10 | 83 | 8 | 12 | 79 | 2 | 44/94 |
| 2010 | 2380 | - | 7 | 92 | 1 | 46 | 35 | 0 | 48/110 |
| 2015 | 3420 | - | 2 | 96 | 2 | 8 | 78 | 1 | 39/77 |
| 2020 | 2460 | 20 | 2 | 95 | 3 | 8 | 39 | 4 | 43/87 |
| 2025 | 2820 | 300 | 1 | 89 | 10 | 26 | 58 | 10 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 380 | 80 | 11 | 90 | 0 | 0 | 0 | 0 | 39/98 |
| 2000 | 320 | 20 | 6 | 88 | 6 | 13 | 0 | 0 | 42/103 |
| 2005 | 360 | - | 6 | 94 | 0 | 0 | 0 | 0 | 37/76 |
| 2010 | 260 | - | 23 | 77 | 0 | 0 | 0 | 0 | 46/91 |
| 2015 | 700 | - | 6 | 94 | 0 | 11 | 0 | 0 | 43/71 |
| 2020 | 340 | - | 6 | 94 | 0 | 29 | 0 | 0 | 50/111 |
| 2025 | 320 | 100 | 6 | 75 | 19 | 19 | 6 | 38 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# DRY FORK MOUNTAIN - STUDY NO. 09-3




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Dry Fork NE; Township 3S, Range 20E, Section 03 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 612408 East 4493597 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 2° magnetic (Lines 2-4: 107° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (18ft & 81ft), Line 2 (33ft), Line 3 (66ft), Line 4 (79ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Vernal, proceed west on 500 North to 3500 West. Turn right onto 3500 West and go up Dry Fork 8.5 miles to the Red Cloud Loop Road. Bear right onto this road and continue up Dry Fork Canyon 1.7 miles to a horse ranch on the left. North across the road from the ranch is a dirt road. Turn right onto this road, go through the gate, and continue 2.2 miles to a fork. Bear right and proceed 0.4 miles to an intersection. Continue straight for 0.25 miles to a faint turnoff on the right. Turn right and drive across the meadow toward Middle Spring. Go 0.2 miles to the base of the hill just before Middle Spring. Park and walk to the highest point on the hill; there is a rock monument on top of the hill. From the monument, the 0-foot baseline stake is 12 paces away at a bearing of 90 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | DRY FORK |
| Elevation | 7,870ft (2,399m) |
| Aspect | Southeast |
| Slope | 13% |
| Sample Dates | 08/08/1995, 07/20/2000, 08/03/2010, 08/25/2015, 07/08/2020, 06/18/2025 |

**Table 09-03.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Dry Fork | - | July 2005 | 517 |

## Wildlife Habitat and Vegetation History

**Table 09-03.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season | Brood/Young Rearing |
|---|---|---|---|
| Mule Deer | crucial | winter | |
| Rocky Mountain Elk | crucial | winter | |
| Greater Sage-Grouse | occupied | year-long & Winter | brood-rearing |

**Table 09-03.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Perennial Grass-Forb/Mountain Big Sagebrush | No Encroachment |
| 2015 | Perennial Grass-Forb/Mountain Big Sagebrush | No Encroachment |
| 2020 | Mountain Big Sagebrush/Perennial Grass-Forb | No Encroachment |
| 2025 | Mountain Big Sagebrush/Perennial Grass-Forb | Early Phase I |

## Site Notes

Much of the browse was removed in the Dry Fork fire that burned 517 acres of the area in July of 2005, and the site was not sampled in that year. The area is administered by the Bureau of Land Management and is grazed as part of the Dry Fork allotment. The area near the site was seeded as part of the Dry Fork Emergency Fire Rehabilitation (WRI project #296), but the site was not within the seeding treatment.

## Soils

**Table 09-03.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.1 | 67.6 | 15.8 | 16.6 | 5.3 | 29.9 | 124.8 | 0.5 | 07/20/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Stony Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC462UT |
| States and Transitions | No state and transition model is available for this ecological site. |

From study establishment in 1982 through the 2000 sample year, the plant community on this site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) (Photos, Pre-1992 Data, Table 09-03.12). The herbaceous understory during this time period was rich and productive and primarily composed of the native perennial grass species needle and thread (*Hesperostipa comata*). Cheatgrass (*Bromus tectorum*) was present, but it was a minor component of the plant community (Table 09-03.10). There was some conifer encroachment occurring, but trees were young and sparsely scattered (Photos). Following a fire in 2005 (Table 09-03.1), the site transitioned to a community dominated by perennial grasses and forbs (Table 09-03.7) with mountain big sagebrush as a small vegetation component. Sagebrush and other shrubs have re-established on this site in subsequent years, with 2025 sagebrush quadrat cover exceeding pre-fire amounts. Recovery of antelope bitterbrush (*Purshia tridentata*) has been slower than that of sagebrush following the burn, but bitterbrush cover and density are moderate as of the most recent sample year (Table 09-03.6, Table 09-03.12, Table 09-03.13). Cheatgrass abundance and cover have exhibited fluctuations following the fire, but values for both were low in 2025 (Table 09-03.10). Without further disturbance, mountain big sagebrush and bitterbrush will likely continue to re-establish in the plant community. Utah juniper (*Juniperus osteosperma*) was observed in point-quarter density measurements for the first time in 2025 (Table 09-03.14). The site is considered to be within Early Phase I of woodland succession as of the most recent sampling (Table 09-03.4), however, indicating that further encroachment is likely not an immediate concern.

Deer winter range condition has ranged between fair-good and good since 1995, while generally remaining stable due to the resilience of the preferred browse, perennial grass, and perennial forb communities. In 2025, deer winter range condition was considered to be good. Recent improvement to deer wintering range has been due to reductions in annual grass cover (Table 09-03.7, Table 09-03.15). Pellet transect data shows that deer presence was high between 2005 and 2010, and again in 2025 (Table 09-03.9). On-site observations in 2025 noted four does and two bucks were seen bedded down.

## Trend Summary Tables

**Table 09-03.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 34.1 | 2.9 | - | - | - | - |
| 2000 | 34.6 | 4.3 | - | - | - | - |
| 2010 | 8.2 | 2.2 | - | 14.1 | 2.8 | - |
| 2015 | 17.5 | 2.6 | - | 21.9 | 2.9 | - |
| 2020 | 26.2 | 2.0 | - | 35.7 | 3.6 | - |
| 2025 | 31.5 | 0.8 | 0.0 | 44.3 | 0.8 | - |

**Table 09-03.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 158 | 382 | 202 | 87 | 2.9 | 16.8 | 2.1 | 1.0 |
| 2000 | 1 | 398 | 20 | 58 | 0.0 | 26.0 | 0.1 | 1.1 |
| 2010 | 247 | 333 | 98 | 218 | 6.0 | 16.9 | 1.1 | 7.2 |
| 2015 | 381 | 262 | 40 | 247 | 7.9 | 9.9 | 0.9 | 11.5 |
| 2020 | 234 | 351 | 103 | 245 | 4.3 | 11.6 | 0.7 | 11.6 |
| 2025 | 141 | 324 | 151 | 231 | 0.8 | 12.6 | 1.4 | 8.2 |

**Table 09-03.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 2.1 | 0.0 | 67.4 | 0.3 | 9.8 | 57.9 |
| 2000 | 4.2 | 0.2 | 65.9 | 1.3 | 13.7 | 64.0 |
| 2010 | 12.2 | - | 35.5 | 1.9 | 22.5 | 45.4 |
| 2015 | 6.8 | 0.1 | 33.6 | 1.4 | 23.9 | 53.5 |
| 2020 | 13.4 | 0.2 | 33.2 | 5.0 | 26.0 | 48.3 |
| 2025 | 22.2 | 0.2 | 31.6 | 0.9 | 23.6 | 46.1 |

**Table 09-03.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 2 | 30 | 6 | 9 |
| 2000 | - | 17 | - | 5 |
| 2010 | 2 | 6 | 15 | 1 |
| 2015 | 2 | 12 | 4 | 12 |
| 2020 | 5 | 38 | 3 | 3 |
| 2025 | 4 | 29 | 4 | 6 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 6.5 (16.1) | 61.0 (150.6) | 3.4 (8.3) | - |
| 2010 | 5.8 (14.3) | 21.5 (53.0) | 8.1 (19.9) | - |
| 2015 | 2.2 (5.4) | 23.4 (57.9) | - | - |
| 2020 | 8.7 (21.5) | 40.9 (101.0) | 4.0 (9.9) | - |
| 2025 | 10.2 (25.1) | 50.9 (125.8) | 1.3 (3.3) | - |

**Table 09-03.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 6 | 7 | - | 158 | 17 | 38 | 80 | 268 | 9 | 7 | 100 |
| 2000 | - | 5 | - | 1 | 16 | 24 | 110 | 246 | 33 | 74 | 40 |
| 2010 | - | 6 | - | 247 | - | - | 133 | 231 | 1 | 30 | - |
| 2015 | - | - | - | 381 | 5 | 1 | 55 | 190 | 2 | 23 | 30 |
| 2020 | - | - | - | 234 | 5 | 32 | 131 | 242 | - | 12 | 29 |
| 2025 | - | - | 3 | 141 | 3 | 9 | 155 | 245 | 3 | 10 | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 0.1 | 0.1 | - | 2.9 | 0.4 | 0.2 | 1.4 | 11.0 | 0.2 | 0.3 | 3.3 |
| 2000 | - | 0.1 | - | 0.0 | 0.5 | 0.3 | 2.7 | 14.5 | 0.4 | 5.6 | 1.7 |
| 2010 | - | 0.1 | - | 6.0 | - | - | 4.3 | 12.4 | 0.0 | 0.2 | - |
| 2015 | - | - | - | 7.9 | 0.0 | 0.0 | 1.3 | 6.8 | 0.0 | 0.5 | 1.4 |
| 2020 | - | - | - | 4.3 | 0.0 | 0.3 | 2.5 | 7.5 | - | 0.3 | 0.9 |
| 2025 | - | - | 0.0 | 0.8 | 0.1 | 0.1 | 2.5 | 9.5 | 0.1 | 0.2 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-03.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus purshii (woollypod milkvetch) | Calochortus nuttallii (sego lily) | Camelina microcarpa[ai] (littlepod false flax) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Hedysarum boreale (Utah sweetvetch) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 3 | 9 | - | 9 | - | 62 | 164 | - | 9 | 7 | 1 | - | - | 13 | - |
| 2000 | - | - | - | 8 | - | - | - | 6 | 5 | - | 2 | 12 | - | - | - | 14 | - |
| 2010 | 2 | - | - | 14 | - | 2 | - | - | - | 5 | 4 | 5 | 8 | - | - | 4 | - |
| 2015 | - | 7 | 4 | 11 | - | 4 | - | - | - | 2 | 6 | - | - | 1 | - | 9 | - |
| 2020 | - | 19 | 1 | 13 | 2 | 2 | 1 | 37 | 7 | 2 | 7 | 4 | 2 | - | 3 | 4 | - |
| 2025 | 1 | 58 | 16 | 20 | 1 | 3 | - | 42 | 8 | 12 | 4 | 8 | 19 | - | - | 4 | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.3 | 1.6 | - | 0.1 | 0.0 | 0.0 | - | - | 0.1 | - |
| 2000 | - | - | - | 0.1 | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.1 | - | - | - | 0.2 | - |
| 2010 | 0.0 | - | - | 0.6 | - | 0.0 | - | - | - | 0.1 | 0.1 | 0.0 | 0.0 | - | - | 0.0 | - |
| 2015 | - | 0.0 | 0.0 | 0.4 | - | 0.0 | - | - | - | 0.0 | 0.1 | - | - | 0.0 | - | 0.1 | - |
| 2020 | - | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - |
| 2025 | 0.0 | 1.0 | 0.1 | 0.4 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.3 | 0.0 | 0.0 | 0.1 | - | - | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Heterotheca villosa (hairy false goldenaster) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Lithospermum ruderale (western stoneseed) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Oenothera pallida[a] (pale evening primrose) | Orobanche fasciculata (clustered broomrape) | Packera debilis (weak groundsel) | Penstemon humilis (low beardtongue) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 3 | - | 2 | 7 | 7 | 3 | - | 2 | - | 3 | - | 30 | - | 32 | - | 1 |
| 2000 | 5 | - | - | - | 0 | 7 | - | - | 5 | - | 3 | 1 | 2 | - | 16 | - | 4 |
| 2010 | 49 | 69 | 4 | 11 | 3 | 1 | - | - | 8 | - | - | 5 | 6 | - | 162 | 2 | - |
| 2015 | 135 | 3 | - | 8 | - | 8 | - | 12 | 7 | 6 | 4 | - | 4 | - | 165 | - | - |
| 2020 | 117 | 2 | 10 | - | 3 | 7 | - | 3 | - | - | 4 | - | 47 | 4 | 161 | - | 1 |
| 2025 | 86 | - | 46 | - | 3 | 17 | 2 | 6 | 6 | - | 1 | - | 33 | 10 | 116 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | 0.0 | 0.2 | 0.1 | 0.0 | - | 0.0 | - | 0.0 | - | 0.1 | - | 0.4 | - | 0.0 |
| 2000 | 0.0 | - | - | - | 0.0 | 0.2 | - | - | 0.1 | - | 0.0 | 0.0 | 0.0 | - | 0.1 | - | 0.1 |
| 2010 | 1.8 | 0.8 | 0.0 | 0.1 | 0.1 | 0.1 | - | - | 0.1 | - | - | 0.2 | 0.0 | - | 3.9 | 0.0 | - |
| 2015 | 5.8 | 0.1 | - | 0.7 | - | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | 4.8 | - | - |
| 2020 | 5.8 | 0.0 | 0.0 | - | 0.0 | 0.3 | - | 0.0 | - | - | 0.0 | - | 0.2 | 0.0 | 5.0 | - | 0.0 |
| 2025 | 3.3 | - | 0.1 | - | 0.0 | 0.6 | 0.0 | 0.0 | 0.1 | - | 0.0 | - | 0.1 | 0.2 | 2.8 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Tragopogon dubius[ai] (yellow salsify) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|
| year | Nested | |
| 1995 | 6 | 15 |
| 2000 | 7 | 6 |
| 2010 | 15 | 13 |
| 2015 | 10 | 1 |
| 2020 | 11 | 15 |
| 2025 | 2 | 28 |
| year | Average Cover (%) | |
| 1995 | 0.0 | 0.0 |
| 2000 | 0.0 | 0.1 |
| 2010 | 0.1 | 0.1 |
| 2015 | 0.1 | 0.0 |
| 2020 | 0.1 | 0.2 |
| 2025 | 0.0 | 0.4 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-03.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Ceanothus fendleri (Fendler's ceanothus) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Mahonia repens (creeping barberry) | Opuntia fragilis (brittle pricklypear) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2010 | 11.5 | 1.1 | 0.2 | 0.7 | 0.8 | - | - | - | 2.6 | - |
| 2015 | 17.1 | 2.1 | 0.6 | 0.2 | - | - | - | - | 4.8 | - |
| 2020 | 29.3 | 2.4 | - | 0.7 | 0.5 | - | - | - | 6.4 | - |
| 2025 | 35.2 | 0.6 | 0 | 0.1 | 0.1 | - | - | - | 9.1 | - |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | 22.7 | - | 0.1 | - | 0.0 | - | - | 2.8 | 10.8 | 0.6 |
| 2000 | 21.8 | - | 0.1 | - | - | - | - | 4.1 | 11.9 | 0.9 |
| 2010 | 7.2 | 0.8 | 0.8 | 0.2 | 0.4 | - | - | - | 1.0 | - |
| 2015 | 14.7 | 1.1 | 0.9 | 0.0 | 0.6 | - | - | - | 2.7 | - |
| 2020 | 21.6 | 1.1 | 0.4 | 0.1 | 0.4 | - | 0.0 | - | 4.5 | - |
| 2025 | 24.0 | 0.6 | 0.1 | 0.0 | 0.1 | 0.0 | - | - | 7.5 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-03.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 34/128 |
| 2000 | - | - | - | - | - | - | - | - | 39/75 |
| 2010 | - | - | - | - | - | - | - | - | 33/57 |
| 2015 | - | - | - | - | - | - | - | - | 42/65 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | 42/78 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2880 | - | 7 | 82 | 11 | 39 | 11 | 7 | 77/122 |
| 2000 | 2720 | 160 | 7 | 74 | 18 | 11 | 0 | 3 | 78/112 |
| 2010 | 1300 | 20 | 5 | 95 | 0 | 40 | 3 | 0 | 48/90 |
| 2015 | 3760 | - | 8 | 92 | 1 | 34 | 1 | 10 | 52/79 |
| 2020 | 3160 | - | 9 | 89 | 3 | 6 | 32 | 11 | 51/102 |
| 2025 | 3560 | 40 | 7 | 90 | 3 | 17 | 23 | 3 | - / - |
| Ceanothus fendleri -- (Fendler's ceanothus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 220 | - | 0 | 100 | 0 | 55 | 0 | 0 | 25/72 |
| 2015 | 180 | - | 0 | 100 | 0 | 67 | 0 | 0 | 22/97 |
| 2020 | 220 | - | 0 | 73 | 27 | 36 | 64 | 27 | 23/106 |
| 2025 | 200 | - | 0 | 70 | 30 | 50 | 0 | 30 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 31/60 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/20 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 34/74 |
| 2015 | 80 | - | 0 | 100 | 0 | 50 | 0 | 0 | 57/85 |
| 2020 | 60 | - | 33 | 67 | 0 | 0 | 33 | 0 | 34/72 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | - / - |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 4/16 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 70/114 |
| 2015 | - | - | - | - | - | - | - | - | 66/101 |
| 2020 | 60 | - | 0 | 67 | 33 | 0 | 0 | 33 | 59/106 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/20 |
| 2000 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | 20/12 |
| 2010 | 360 | - | 0 | 100 | 0 | 0 | 0 | 6 | 23/38 |
| 2015 | 520 | - | 15 | 85 | 0 | 0 | 0 | 0 | 18/27 |
| 2020 | 980 | 20 | 8 | 92 | 0 | 0 | 0 | 0 | 20/24 |
| 2025 | 800 | 20 | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/23 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/11 |
| 2010 | - | - | - | - | - | - | - | - | 5/8 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/12 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 4680 | 80 | 5 | 94 | 0 | 0 | 0 | 3 | 12/37 |
| 2000 | 6060 | 80 | 4 | 94 | 2 | 0 | 0 | 1 | 9/27 |
| 2010 | - | - | - | - | - | - | - | - | 13/56 |
| 2015 | - | - | - | - | - | - | - | - | 13/55 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/17 |
| 2025 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/9 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 1960 | - | 13 | 83 | 4 | 32 | 58 | 1 | 44/117 |
| 2000 | 1880 | - | 14 | 72 | 14 | 14 | 53 | 4 | 50/126 |
| 2010 | 280 | - | 0 | 100 | 0 | 29 | 7 | 0 | 35/109 |
| 2015 | 340 | - | 6 | 94 | 0 | 47 | 18 | 12 | 40/129 |
| 2020 | 420 | 40 | 0 | 100 | 0 | 38 | 33 | 0 | 43/145 |
| 2025 | 1280 | 440 | 36 | 64 | 0 | 8 | 50 | 0 | - / - |
| Ribes cereum var. cereum[p] -- (wax currant) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 114/171 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/74 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/82 |
| 2010 | - | - | - | - | - | - | - | - | 30/104 |
| 2015 | - | - | - | - | - | - | - | - | 35/93 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/155 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

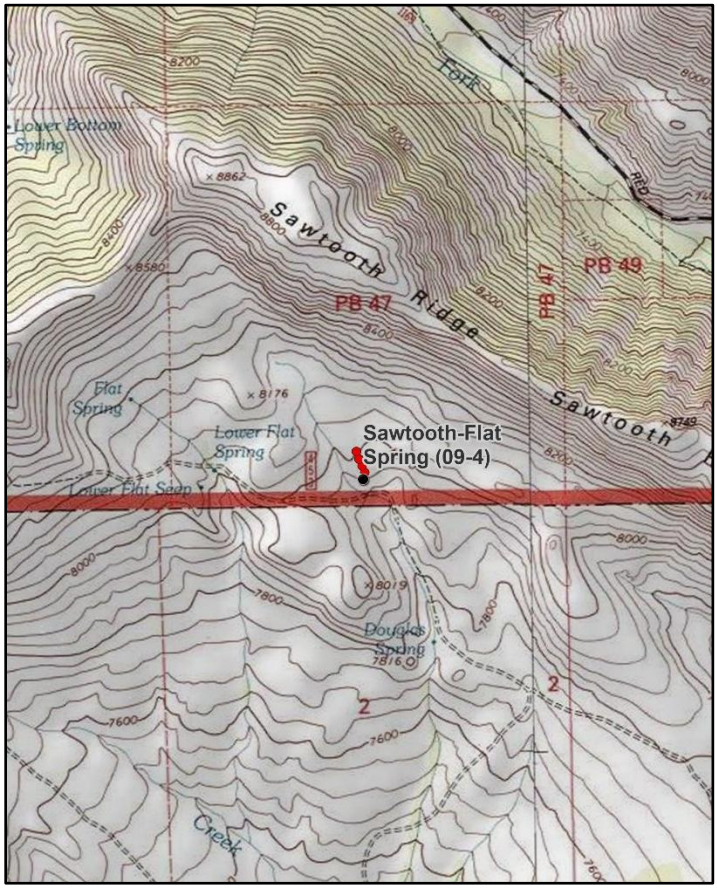
**Table 09-03.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

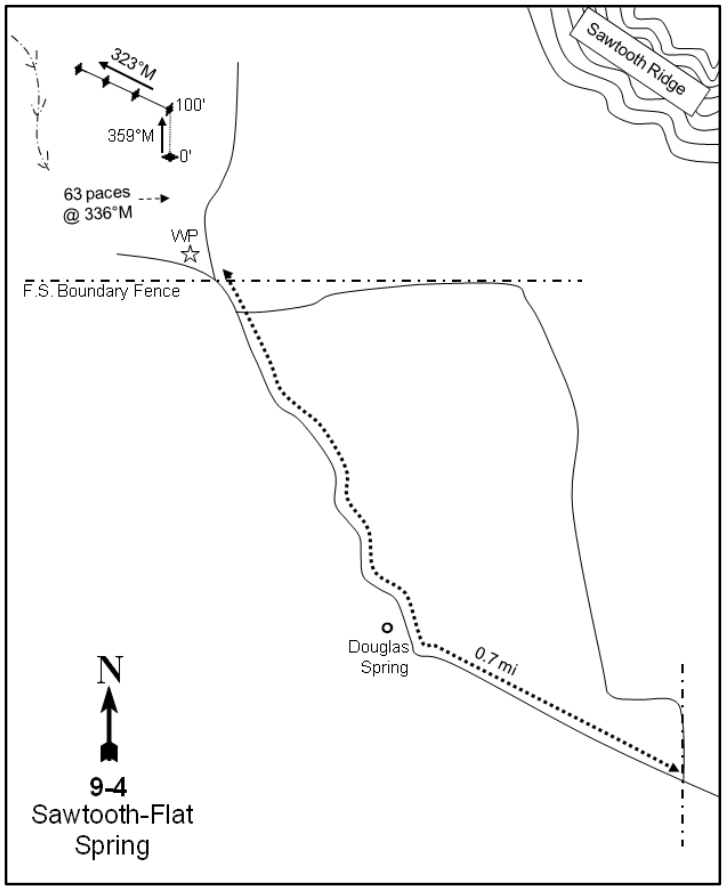
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2025 | 3 | 100 | - | - | - | - | 1.0 |

**Table 09-03.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 12.4 | 4.4 | 30.0 | -2.2 | 2.0 | 0.0 | **76.6** | Good |
| 2000 | 30.0 | 10.1 | 4.7 | 30.0 | 0.0 | 2.3 | 0.0 | **77.1** | Good |
| 2010 | 18.3 | 15.0 | 1.9 | 30.0 | -4.5 | 10.0 | 0.0 | **70.7** | Fair-Good |
| 2015 | 28.6 | 14.9 | 3.8 | 19.8 | -5.9 | 10.0 | 0.0 | **71.2** | Fair-Good |
| 2020 | 30.0 | 14.4 | 3.7 | 23.3 | -3.2 | 10.0 | 0.0 | **78.2** | Good |
| 2025 | 30.0 | 14.4 | 6.3 | 25.1 | -0.6 | 10.0 | 0.0 | **85.2** | Good |

# SAWTOOTH-FLAT SPRING - STUDY NO. 09-4




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Lake Mountain NE; Township 2S, Range 19E, Section 35 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 605042 East 4494348 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 709 |
| Transect Bearing | 2° magnetic (Lines 2-4: 323° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Lapoint, drive east, then turn north just before the bridge over Deep Creek. Proceed north for 6.9 miles to a fork. Turn right and proceed toward Deep Creek Ranch. Stay on this road for 9.8 miles to a dirt road on the left heading north up to Pine Ridge: this road can also be reached by driving 3 miles west from Dry Fork. There is a gate here that may be locked. After going through the gate, turn left and drive 1.7 miles to a cattle guard. Continue 1.1 miles to another gate. Go through this gate and proceed 0.7 miles to the fence and gate on the Forest Service boundary. Go through the gate and stop. From the yellow fence post near the gate, walk 63 paces north at a bearing of 336 degrees magnetic to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | LAKE MOUNTAIN |
| Elevation | 7,965ft (2,428m) |
| Aspect | Southeast |
| Slope | 15-16% |
| Sample Dates | 08/08/1995, 07/20/2000, 07/19/2005, 08/03/2010, 07/15/2015, 08/19/2020, 07/07/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season | Brood/Young Rearing |
|---|---|---|---|
| Mule Deer | crucial | winter | |
| Rocky Mountain Elk | crucial | winter | |
| Greater Sage-Grouse | occupied | year-long & Winter | brood-rearing |
| Shiras Moose | crucial | year-long | |

**Table 09-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | No Encroachment |
| 1988 | Mountain Big Sagebrush | No Encroachment |
| 1995 | Mountain Big Sagebrush | No Encroachment |
| 2000 | Mountain Big Sagebrush | No Encroachment |
| 2005 | Mountain Big Sagebrush | No Encroachment |
| 2010 | Mountain Big Sagebrush | No Encroachment |
| 2015 | Mountain Big Sagebrush | No Encroachment |
| 2020 | Mountain Big Sagebrush | No Encroachment |
| 2025 | Mountain Big Sagebrush | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 09-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.1 | 67.4 | 18.3 | 14.3 | 4.3 | 28.2 | 236.8 | 0.7 | 07/20/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 20 inches |
| NRCS Ecological Site | Mountain Gravelly Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XA406UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1982, the plant community on this site has been dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) (Photos, Pre-1992 Data, Table 09-04.12, Table 09-04.13) with a rich and productive herbaceous understory (Table 09-04.7). The grass component has consisted mostly of the perennial species muttongrass (*Poa fendleriana*), Letterman's needlegrass (*Achnatherum lettermanii*), and/or needle and thread (*Hesperostipa comata*) throughout the study period. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed since 2015, but with low abundance and cover (Table 09-04.10). The perennial forb arrowleaf balsamroot (*Balsamorhiza sagittata*) has provided more cover than any other herbaceous species in most sample years (Table 09-04.11). The community structure on this site will likely remain stable over time without a major disturbance, although without a disturbance, sagebrush may increase and the herbaceous community may decrease in prominence.

Deer winter range condition has remained good since 1995. Condition stability can be attributed to stable preferred browse cover, and perennial grass and forb cover. In 2025, deer winter range condition was considered to be good. Improvement to deer wintering range can been achieved through efforts that increase preferred browse recruitment. Attention should be given to the recent invasion of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 09-04.7, Table 09-04.13, Table 09-04.15). Pellet transect data shows that deer presence was high between 2000 and 2005, and again in 2025. During the 2024/25 winter season the area had dispersed occurrences of collared mule deer (Wildlife Migration Initiative). Utilization of antelope bitterbrush has remained high for much of the sample period, with more than 80% of plants sampled in density strips exhibiting signs of heavy browsing since 2005 (Table 09-04.13). Greater sage-grouse had a notable presence in 2025, as did cattle (Table 09-04.9).

## Trend Summary Tables

**Table 09-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 16.4 | 0.3 | - | - | - | - |
| 2000 | 18.9 | 0.4 | - | - | - | - |
| 2005 | 18.0 | 0.2 | - | 33.0 | - | - |
| 2010 | 13.8 | 0.3 | - | 24.7 | 0.2 | - |
| 2015 | 13.8 | 0.2 | - | 23.5 | 0.7 | - |
| 2020 | 18.7 | 0.5 | - | 21.9 | 0.6 | - |
| 2025 | 14.0 | 0.2 | - | 21.2 | - | - |

**Table 09-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 435 | 336 | 300 | - | 22.7 | 3.9 | 19.5 |
| 2000 | - | 456 | 56 | 248 | - | 30.2 | 0.2 | 19.7 |
| 2005 | - | 397 | 312 | 263 | - | 12.1 | 2.0 | 21.3 |
| 2010 | - | 405 | 83 | 274 | - | 19.8 | 0.2 | 19.8 |
| 2015 | 62 | 437 | 248 | 265 | 2.7 | 28.7 | 1.5 | 20.4 |
| 2020 | 23 | 379 | 294 | 234 | 0.1 | 17.2 | 2.0 | 27.8 |
| 2025 | 14 | 397 | 195 | 315 | 0.1 | 18.4 | 0.8 | 24.4 |

**Table 09-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 5.6 | - | 63.0 | 1.1 | 2.1 | 61.3 |
| 2000 | 7.5 | 0.4 | 65.4 | 1.8 | 1.6 | 64.1 |
| 2005 | 18.9 | 0.1 | 50.0 | 1.0 | 2.6 | 47.3 |
| 2010 | 12.8 | - | 42.0 | 2.9 | 1.0 | 54.0 |
| 2015 | 8.9 | 0.0 | 34.5 | 0.9 | 2.2 | 67.4 |
| 2020 | 9.7 | 0.5 | 32.8 | 1.8 | 2.6 | 64.7 |
| 2025 | 9.1 | 0.0 | 51.7 | 1.4 | 1.9 | 57.5 |

**Table 09-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit | Domestic Sheep |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | 9 | 31 | 5 | - | 5 | - |
| 2000 | 1 | 30 | 8 | - | 4 | - |
| 2005 | 9 | 25 | 7 | - | 38 | - |
| 2010 | 3 | 14 | - | - | 8 | - |
| 2015 | 3 | 16 | - | - | 27 | - |
| 2020 | 7 | 27 | 8 | - | 6 | - |
| 2025 | 8 | 30 | - | 1 | 4 | - |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 16.0 (39.5) | 74.4 (183.7) | 26.2 (64.6) | - | - | - |
| 2005 | 22.5 (55.6) | 57.7 (142.4) | 11.4 (28.1) | - | - | - |
| 2010 | 1.5 (3.6) | 30.2 (74.5) | 2.7 (6.6) | - | - | 0.7 (1.7) |
| 2015 | 16.7 (41.2) | 14.1 (34.8) | 7.4 (18.2) | - | - | - |
| 2020 | 2.2 (5.4) | 29.5 (72.8) | 4.7 (11.6) | 8.7 (21.5)* | - | - |
| 2025 | 36.3 (89.7) | 65.7 (162.2) | - | 87.1 (215.2)* | - | - |

*Pellets per acre (ha)

**Table 09-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Carex phaeocephala (dunhead sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | - | 159 | - | 25 | - | - | 6 | 123 | 189 | 0 | 146 | 166 | 16 |
| 2000 | - | 15 | - | 56 | - | - | 1 | 78 | 228 | 6 | 152 | 197 | 3 |
| 2005 | - | 101 | - | 22 | - | - | 2 | 87 | 239 | 2 | 173 | 103 | 25 |
| 2010 | - | 143 | - | 41 | - | - | - | 39 | 52 | 7 | 198 | 163 | 11 |
| 2015 | 3 | 85 | 62 | 23 | - | - | 2 | 66 | 67 | 2 | 115 | 336 | 8 |
| 2020 | - | 178 | 23 | 46 | - | - | - | 81 | 101 | 8 | 158 | 123 | 8 |
| 2025 | - | 186 | 14 | - | 34 | 31 | - | 101 | 38 | 30 | 205 | 49 | 18 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | - | 4.2 | - | 0.2 | - | - | 0.0 | 1.4 | 6.0 | 0.0 | 3.0 | 7.8 | 0.1 |
| 2000 | - | 0.5 | - | 2.2 | - | - | 0.0 | 0.7 | 12.5 | 0.1 | 4.4 | 9.8 | 0.0 |
| 2005 | - | 1.1 | - | 0.1 | - | - | 0.0 | 0.5 | 4.9 | 0.0 | 3.0 | 2.2 | 0.3 |
| 2010 | - | 3.3 | - | 0.6 | - | - | - | 0.4 | 1.7 | 0.2 | 6.4 | 7.1 | 0.1 |
| 2015 | 0.0 | 2.2 | 2.7 | 0.2 | - | - | 0.0 | 0.4 | 1.4 | 0.0 | 3.0 | 21.4 | 0.1 |
| 2020 | - | 3.8 | 0.1 | 0.6 | - | - | - | 0.5 | 4.3 | 0.0 | 4.6 | 3.3 | 0.0 |
| 2025 | - | 5.3 | 0.1 | - | 1.2 | 0.2 | - | 1.4 | 0.8 | 0.2 | 7.4 | 1.3 | 0.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Alyssum desertorum[ai] (desert madwort) | Antennaria (pussytoes) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Artemisia ludoviciana (white sagebrush) | Astragalus (milkvetch) | Astragalus spatulatus (tufted milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 7 | 122 | - | 15 | - | - | 6 | - | 6 | - | 177 | 2 | 4 | - | - | 18 | 199 |
| 2000 | 13 | 29 | - | 1 | - | - | 7 | 5 | - | - | 157 | - | 2 | - | - | - | 19 |
| 2005 | 13 | 51 | - | 1 | - | - | 4 | - | - | - | 152 | 1 | 1 | - | 2 | 8 | 290 |
| 2010 | - | 54 | - | - | - | - | - | - | - | - | 166 | 5 | - | - | - | 1 | 72 |
| 2015 | 5 | 7 | - | 13 | - | - | 3 | - | - | 3 | 187 | - | - | - | - | - | 79 |
| 2020 | 26 | 59 | - | 21 | - | - | - | - | - | - | 135 | - | - | - | - | - | 266 |
| 2025 | 106 | 29 | 12 | - | 20 | 6 | - | - | - | - | 190 | - | 5 | 3 | - | - | 121 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.4 | - | 0.3 | - | - | 0.0 | - | 0.0 | - | 13.9 | 0.0 | 0.0 | - | - | 0.0 | 1.3 |
| 2000 | 0.1 | 0.2 | - | 0.0 | - | - | 0.0 | 0.0 | - | - | 15.2 | - | 0.0 | - | - | - | 0.1 |
| 2005 | 0.1 | 0.2 | - | 0.0 | - | - | 0.0 | - | - | - | 16.5 | 0.0 | 0.0 | - | 0.0 | 0.0 | 1.3 |
| 2010 | - | 0.1 | - | - | - | - | - | - | - | - | 14.8 | 0.0 | - | - | - | 0.0 | 0.1 |
| 2015 | 0.0 | 0.1 | - | 0.2 | - | - | 0.0 | - | - | 0.0 | 14.1 | - | - | - | - | - | 0.1 |
| 2020 | 0.1 | 0.3 | - | 0.8 | - | - | - | - | - | - | 23.9 | - | - | - | - | - | 1.5 |
| 2025 | 0.8 | 0.1 | 0.0 | - | 0.9 | 0.1 | - | - | - | - | 19.7 | - | 0.0 | 0.0 | - | - | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Heterotheca villosa (hairy false goldenaster) | Lappula occidentalis[a] (flatspine stickseed) | Lomatium triternatum (nineleaf biscuitroot) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 293 | 3 | 23 | 2 | - | - | 15 | - | - | 1 | - | 7 | 7 | 15 | - | - | 11 |
| 2000 | 25 | 8 | 1 | - | - | - | - | - | 4 | 5 | - | 11 | 17 | 14 | 2 | - | 5 |
| 2005 | 142 | - | 5 | 5 | - | 4 | 29 | 1 | 5 | 0 | 6 | 12 | 5 | 17 | 4 | - | 7 |
| 2010 | - | - | - | 32 | - | - | - | - | 6 | - | - | 14 | 11 | 7 | 66 | - | 3 |
| 2015 | 69 | - | 3 | 12 | - | - | 152 | 40 | - | 1 | 3 | 11 | 4 | - | 3 | 7 | - |
| 2020 | 113 | 3 | 1 | 5 | - | - | - | 3 | 4 | 1 | 4 | - | 7 | 8 | - | - | 1 |
| 2025 | 55 | - | 14 | - | 4 | 6 | - | 72 | 12 | - | - | 15 | 7 | 1 | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 2.1 | 0.0 | 0.4 | 0.0 | - | - | 0.1 | - | - | 0.0 | - | 0.1 | 0.1 | 0.3 | - | - | 0.0 |
| 2000 | 0.1 | 0.1 | 0.0 | - | - | - | - | - | 0.0 | 0.1 | - | 0.3 | 0.3 | 0.1 | 0.0 | - | 0.1 |
| 2005 | 0.4 | - | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.0 |
| 2010 | - | - | - | 0.1 | - | - | - | - | 0.0 | - | - | 0.4 | 0.3 | 0.1 | 0.4 | - | 0.0 |
| 2015 | 0.2 | - | 0.0 | 0.1 | - | - | 0.8 | 0.2 | - | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | - |
| 2020 | 0.3 | 0.1 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.1 | - | - | 0.0 |
| 2025 | 0.1 | - | 0.1 | - | 0.0 | 0.0 | - | 0.2 | 0.1 | - | - | 0.2 | 0.1 | 0.0 | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lupinus argenteus (silvery lupine) | Mertensia (bluebells) | Orobanche fasciculata (clustered broomrape) | Orthocarpus luteus[a] (yellow owl's-clover) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | unknown annual forb[a] (unknown forb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 97 | - | 8 | - | 2 | - | 37 | 47 | 84 | 3 | 1 | 2 | 13 | - | - | 7 | - |
| 2000 | 81 | - | 3 | - | 1 | - | 20 | 21 | 14 | 3 | - | 2 | 1 | - | - | - | - |
| 2005 | 75 | 3 | 5 | - | 10 | - | 3 | 44 | 74 | 2 | - | 13 | 7 | - | 3 | - | - |
| 2010 | 88 | 3 | - | 3 | 3 | - | 3 | 9 | 7 | - | 3 | - | 5 | 1 | 3 | - | 13 |
| 2015 | 92 | 4 | 5 | - | 8 | 7 | 22 | 32 | 4 | - | - | 12 | 2 | 10 | 50 | - | - |
| 2020 | 49 | 3 | - | - | 3 | - | 5 | 22 | 100 | - | - | 1 | 11 | - | - | - | - |
| 2025 | 58 | - | - | 1 | - | - | 9 | 94 | 47 | - | - | - | 18 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 3.4 | - | 0.0 | - | 0.0 | - | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | - | - | 0.0 | - |
| 2000 | 2.7 | - | 0.0 | - | 0.0 | - | 0.3 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | - | - | - |
| 2005 | 3.3 | 0.1 | 0.0 | - | 0.0 | - | 0.0 | 0.2 | 0.2 | 0.0 | - | 0.1 | 0.0 | - | 0.1 | - | - |
| 2010 | 3.2 | 0.1 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.1 |
| 2015 | 4.9 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | 0.4 | - | - |
| 2020 | 2.1 | 0.0 | - | - | 0.0 | - | 0.0 | 0.1 | 0.3 | - | - | 0.0 | 0.1 | - | - | - | - |
| 2025 | 1.2 | - | - | 0.0 | - | - | 0.1 | 0.7 | 0.1 | - | - | - | 0.1 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Viola (violet) | Zigadenus elegans (mountain deathcamas) |
|---|---|---|
| year | Nested | |
| 1995 | - | 4 |
| 2000 | - | 1 |
| 2005 | - | 18 |
| 2010 | - | 11 |
| 2015 | 8 | 3 |
| 2020 | - | 14 |
| 2025 | 1 | 20 |
| year | Average Cover (%) | |
| 1995 | - | 0.0 |
| 2000 | - | 0.0 |
| 2005 | - | 0.1 |
| 2010 | - | 0.0 |
| 2015 | 0.2 | 0.0 |
| 2020 | - | 0.1 |
| 2025 | 0.0 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Mahonia repens (creeping barberry) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2005 | 23.4 | - | - | - | - | 8.5 | 1.1 |
| 2010 | 17.5 | - | 0.2 | - | - | 5.8 | 1.4 |
| 2015 | 15.1 | 0.4 | 0.3 | - | - | 6.9 | 1.5 |
| 2020 | 15.6 | 0.4 | 0.2 | - | - | 5.7 | 0.6 |
| 2025 | 16 | - | 0 | - | - | 4.3 | 0.9 |
| year | Quadrat Cover (%) | | | | | | |
| 1995 | 12.3 | 0.3 | 0.0 | 0.0 | 0.0 | 3.9 | 0.3 |
| 2000 | 15.3 | 0.4 | 0.0 | 0.0 | - | 3.1 | 0.5 |
| 2005 | 14.1 | 0.2 | 0.1 | - | - | 2.8 | 1.1 |
| 2010 | 11.1 | 0.2 | 0.2 | - | - | 2.0 | 0.7 |
| 2015 | 10.9 | 0.1 | 0.1 | 0.0 | - | 1.9 | 1.0 |
| 2020 | 13.9 | 0.1 | 0.1 | 0.2 | - | 4.1 | 0.7 |
| 2025 | 10.3 | 0.0 | 0.0 | 0.2 | - | 3.1 | 0.7 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 33/41 |
| 2010 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | 35/32 |
| 2015 | - | - | - | - | - | - | - | - | 35/64 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 51/78 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 100 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2040 | 60 | 10 | 77 | 14 | 56 | 4 | 4 | 69/109 |
| 2000 | 2740 | 600 | 10 | 67 | 23 | 4 | 1 | 8 | 71/100 |
| 2005 | 2680 | 2260 | 16 | 63 | 22 | 37 | 18 | 7 | 80/101 |
| 2010 | 2760 | 100 | 9 | 75 | 17 | 38 | 19 | 16 | 70/95 |
| 2015 | 2080 | 40 | 13 | 48 | 39 | 36 | 14 | 51 | 67/99 |
| 2020 | 2060 | 140 | 6 | 70 | 24 | 27 | 6 | 17 | 57/96 |
| 2025 | 2180 | 20 | 19 | 51 | 30 | 15 | 6 | 32 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 34/64 |
| 2000 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 38/53 |
| 2005 | 100 | - | 20 | 80 | 0 | 20 | 20 | 0 | 26/41 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 37/50 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 32/39 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 41/56 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | 30/35 |
| 2000 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/20 |
| 2005 | 700 | 20 | 14 | 86 | 0 | 37 | 9 | 6 | 13/17 |
| 2010 | 340 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/25 |
| 2015 | 160 | - | 38 | 50 | 13 | 0 | 0 | 13 | 7/9 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | 10/14 |
| 2000 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | 6/9 |
| 2005 | 460 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/10 |
| 2010 | 360 | - | 11 | 89 | 0 | 0 | 0 | 0 | 9/15 |
| 2015 | 260 | - | 0 | 100 | 0 | 0 | 0 | 31 | 8/12 |
| 2020 | 660 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/11 |
| 2025 | 740 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 4/13 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/13 |
| 2005 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | 3/4 |
| 2010 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 4/7 |
| 2015 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | 6/21 |
| 2020 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | 5/12 |
| 2025 | 160 | - | 13 | 50 | 38 | 0 | 0 | 38 | - / - |

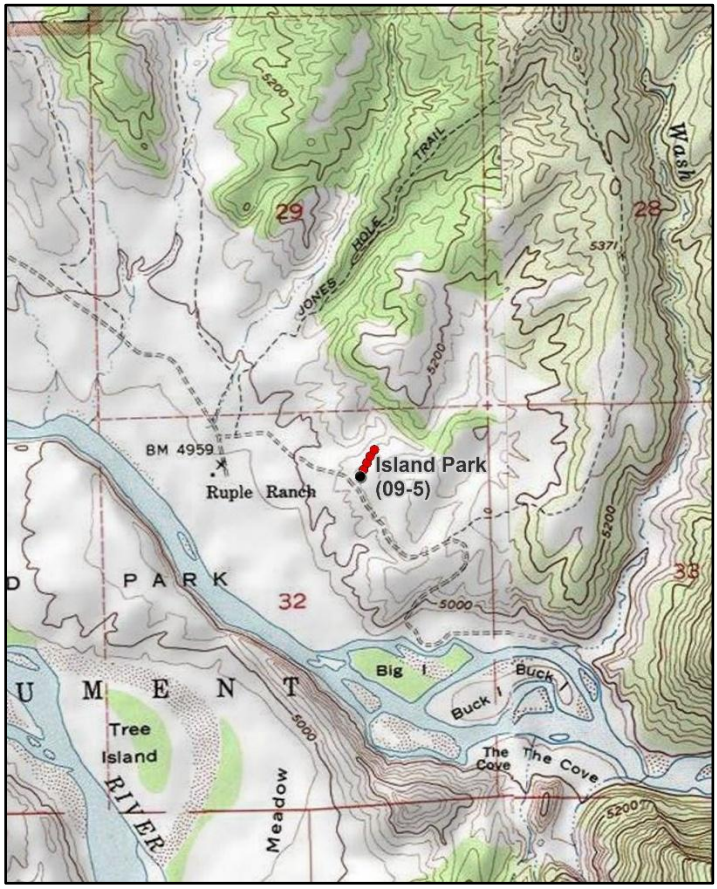
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/11 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 1720 | - | 11 | 67 | 22 | 33 | 48 | 9 | 34/82 |
| 2000 | 1520 | 20 | 14 | 75 | 11 | 13 | 55 | 8 | 35/81 |
| 2005 | 1440 | - | 13 | 75 | 13 | 8 | 89 | 6 | 36/80 |
| 2010 | 1420 | - | 7 | 90 | 3 | 3 | 92 | 1 | 33/73 |
| 2015 | 1300 | - | 15 | 65 | 20 | 5 | 83 | 15 | 31/74 |
| 2020 | 1240 | - | 2 | 87 | 11 | 13 | 87 | 8 | 37/81 |
| 2025 | 1300 | - | 5 | 72 | 23 | 8 | 86 | 23 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 460 | 40 | 26 | 74 | 0 | 44 | 0 | 0 | 51/130 |
| 2000 | 260 | - | 8 | 77 | 15 | 0 | 0 | 8 | 47/147 |
| 2005 | 220 | - | 9 | 91 | 0 | 46 | 0 | 0 | 52/111 |
| 2010 | 340 | - | 6 | 94 | 0 | 0 | 0 | 24 | 45/86 |
| 2015 | 420 | - | 43 | 57 | 0 | 38 | 0 | 0 | 47/83 |
| 2020 | 280 | - | 14 | 64 | 21 | 57 | 14 | 21 | 47/96 |
| 2025 | 340 | - | 6 | 88 | 6 | 12 | 47 | 6 | - / - |

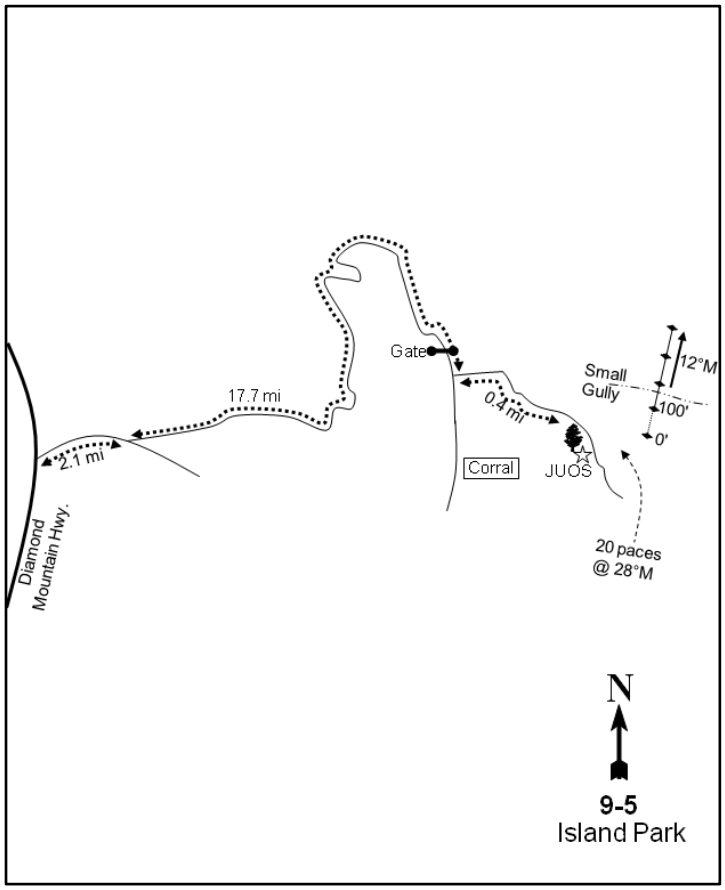
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-04.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 21.4 | 10.4 | 5.1 | 30.0 | 0.0 | 10.0 | 0.0 | **76.9** | Good |
| 2000 | 24.3 | 8.7 | 5.1 | 30.0 | 0.0 | 10.0 | 0.0 | **78.1** | Good |
| 2005 | 30.0 | 9.4 | 7.3 | 24.3 | 0.0 | 10.0 | 0.0 | **81.0** | Good |
| 2010 | 30.0 | 11.3 | 4.1 | 30.0 | 0.0 | 10.0 | 0.0 | **85.4** | Good |
| 2015 | 30.0 | 5.6 | 7.6 | 30.0 | -2.1 | 10.0 | 0.0 | **81.1** | Good |
| 2020 | 28.7 | 8.7 | 2.5 | 30.0 | -0.1 | 10.0 | 0.0 | **79.8** | Good |
| 2025 | 27.4 | 6.7 | 7.9 | 30.0 | -0.1 | 10.0 | 0.0 | **81.9** | Good |

# ISLAND PARK - STUDY NO. 09-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Island Park SE; Township 3S, Range 25E, Section 32 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 658187 East 4487183 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 12° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (9ft & 88ft), Line 2 (26ft), Line 3 (48ft), Line 4 (73ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Diamond Mountain Highway, take the Island Park turnoff to the right. Proceed east for 2.1 miles to a fork. Stay to the left and go 17.7 miles. Just past the Ruple Ranch sign, there is a turnoff to the left; the road may be closed. Turn left and proceed up the ridge for 0.4 miles to a juniper next to the road on the right. From the juniper, the 0-foot baseline stake is 20 paces away at a bearing of 28 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | NPS |
| Allotment | No data |
| Elevation | 5,000ft (1,524m) |
| Aspect | West |
| Slope | 12-25% |
| Sample Dates | 08/10/1995, 07/31/2000, 07/14/2005, 07/27/2010, 06/25/2015, 07/22/2020, 07/07/2025 |

**Table 09-05.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Island Park | - | 2010 | 19.7 |

## Wildlife Habitat and Vegetation History

**Table 09-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | year-long |
| Rocky Mountain Elk | crucial | winter |

**Table 09-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Wyoming Big Sagebrush | Early Phase I |
| 1988 | Wyoming Big Sagebrush | Early Phase I |
| 1995 | Wyoming Big Sagebrush | Early Phase I |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Annual-Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2010 | Annual-Perennial Grass | Early Phase I |
| 2015 | Annual-Perennial Grass | Early Phase I |
| 2020 | Annual-Perennial Grass | Early Phase I |
| 2025 | Annual-Perennial Grass | Early Phase I |

## Site Notes

There was a small fire that burned most of the study transect just prior to the 2010 reading, but most of the surrounding area was unaffected.

## Soils

**Table 09-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.3 | 57.4 | 26.7 | 15.9 | 0.6 | 4.0 | 112.0 | 0.6 | 07/31/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 9 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1988-2000 - Current Potential State: Community Phase 2.1<br>2005 - Current Potential State: Community Phase 2.5<br>2010-2025 - Invasive Annual State: Community Phase Undefined |

From study establishment in 1982 through the 2010 sample year, the plant community on this site was dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (Pre-1992 Data, Table 09-05.12). The herbaceous understory was fairly diverse (Table 09-05.7), but over time the introduced annual grass species cheatgrass (*Bromus tectorum*) increased in abundance (Table 09--05.10). There was some conifer encroachment during this period, but trees were mostly young and sparsely scattered across the area (Photos). In 2005, density of sagebrush decreased substantially (Table 09-05.13) and the plant community transitioned to one dominated by perennial and annual grasses with depleted shrub populations. Following a small fire in 2010 (Table 09-05.1), the site transitioned to a perennial and annual grass plant community (Table 09-05.7, Table 09-05.10). Most of the trees and shrubs were removed from the site; Rocky Mountain juniper (*Juniperus scopulorum*) appeared in the community in 2020, but only Utah juniper (*J. scopulorum*) was sampled in point-quarter in 2025 (Table 09-05.14). No sagebrush has been sampled in density or cover measurements since 2015 (Table 09-05.12). Furthermore, sagebrush may be slow to re-establish due to the high abundance of cheatgrass and lower the resilience of the community.

Deer winter range condition has decreased from good in 1995 to poor-fair in 2025. The decrease in condition quality can be attributed to the removal of preferred browse and an increase in annual grass cover; these changes correlate with the Island Park wildfire. Improvement to deer wintering range could be achieved through efforts that reintroduce preferred browse species. Attention should also be given to the presence of cheatgrass, which can decrease the resistance and resilience of the site to disturbance (Table 09-05.6, Table 09-05.7, Table 09-05.15). Pellet transect data shows that deer presence was high in 2000 and 2010 but has remained low since 2015. During the 2024/25 winter season the area northwest of the study had concentrated occurrences of collared mule deer, but no occurrences on site (Wildlife Migration Initiative). The presence of elk has been considered high in most sample years, but presence was much lower in 2015 and 2025 (Table 09-05.9). Furthermore, on-site observations for 2025 note little to no utilization of theherbaceous understory, which correlates with the lower big game presence observed in the most recent sample year.

## Trend Summary Tables

**Table 09-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 7.9 | 1.1 | - | - | - | - |
| 2000 | 5.8 | 12.9 | - | - | - | - |
| 2005 | 1.9 | 2.6 | - | 2.4 | 3.3 | - |
| 2010 | - | 0.3 | - | - | - | - |
| 2015 | 0.0 | 2.0 | - | - | 2.4 | - |
| 2020 | - | 0.4 | - | - | 1.1 | - |
| 2025 | - | 0.2 | - | - | 1.0 | - |

**Table 09-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 395 | 355 | 127 | 186 | 3.1 | 13.7 | 0.5 | 0.9 |
| 2000 | 114 | 290 | 7 | 51 | 1.5 | 12.1 | 0.0 | 0.2 |
| 2005 | 432 | 258 | 81 | 61 | 15.5 | 13.4 | 0.5 | 1.0 |
| 2010 | 31 | 204 | 1 | 47 | 1.1 | 3.5 | 0.0 | 0.3 |
| 2015 | 476 | 328 | 28 | 153 | 19.6 | 10.4 | 0.2 | 1.6 |
| 2020 | 486 | 296 | 104 | 47 | 59.9 | 11.5 | 1.0 | 0.7 |
| 2025 | 423 | 316 | 41 | 154 | 18.4 | 20.0 | 0.2 | 3.9 |

**Table 09-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 31.1 | 10.8 | 32.3 | 0.0 | - | 30.8 |
| 2000 | 44.4 | 12.3 | 34.8 | 0.1 | - | 35.0 |
| 2005 | 37.4 | 1.0 | 28.5 | 0.0 | - | 38.9 |
| 2010 | 14.9 | - | 79.6 | - | - | 5.5 |
| 2015 | 13.5 | 0.1 | 61.0 | - | - | 36.8 |
| 2020 | 6.0 | 1.8 | 64.9 | 0.4 | 0.6 | 69.2 |
| 2025 | 15.5 | 1.4 | 53.3 | 0.0 | - | 42.0 |

**Table 09-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 32 | 6 | 45 |
| 2000 | - | 21 | 25 | 10 |
| 2005 | - | 29 | 48 | 51 |
| 2010 | - | 29 | 27 | 7 |
| 2015 | - | 6 | 23 | 19 |
| 2020 | - | 8 | 41 | 9 |
| 2025 | - | 3 | 22 | 39 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 17.4 (43.0)* | 48.9 (120.8) | 57.7 (142.4) | - |
| 2005 | - | 22.1 (54.6) | 64.3 (158.9) | - |
| 2010 | - | 43.6 (107.6) | 46.9 (115.9) | - |
| 2015 | - | 7.4 (18.2) | 20.8 (51.3) | - |
| 2020 | - | 12.1 (29.8) | 109.2 (269.8) | - |
| 2025 | - | 5.3 (13.2) | 22.1 (54.6) | - |

*Pellets per acre (ha)

**Table 09-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 7 | - | 43 | 38 | 40 | 329 | 47 | 5 | 4 | 5 | - | 393 |
| 2000 | 12 | - | 109 | 5 | 46 | 243 | 22 | - | 8 | 4 | - | 5 |
| 2005 | 6 | - | 379 | 11 | 31 | 219 | 50 | - | 28 | 1 | - | 238 |
| 2010 | 6 | - | 31 | - | 71 | 111 | 41 | - | - | - | - | - |
| 2015 | 1 | - | 476 | 1 | 125 | 217 | 67 | - | 13 | - | - | 2 |
| 2020 | 3 | 2 | 481 | - | 136 | 184 | 25 | - | 4 | 1 | 14 | 187 |
| 2025 | 5 | - | 339 | 7 | 133 | 202 | 19 | - | 42 | - | 16 | 352 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.4 | - | 0.2 | 0.2 | 0.1 | 12.3 | 0.5 | 0.1 | 0.0 | 0.0 | - | 3.0 |
| 2000 | 0.6 | - | 1.5 | 0.1 | 1.4 | 9.5 | 0.2 | - | 0.0 | 0.2 | - | 0.1 |
| 2005 | 0.1 | - | 12.5 | 0.7 | 0.3 | 10.7 | 1.1 | - | 0.3 | 0.1 | - | 3.0 |
| 2010 | 0.1 | - | 1.1 | - | 1.0 | 1.6 | 0.8 | - | - | - | - | - |
| 2015 | 0.0 | - | 19.6 | 0.0 | 1.4 | 6.3 | 2.5 | - | 0.3 | - | - | 0.0 |
| 2020 | 0.1 | 0.1 | 57.8 | - | 2.0 | 8.7 | 0.4 | - | 0.0 | 0.0 | 0.3 | 2.1 |
| 2025 | 0.4 | - | 7.8 | 0.2 | 5.1 | 12.9 | 0.9 | - | 0.4 | - | 0.1 | 10.6 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus purshii (woollypod milkvetch) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron (fleabane) | Euphorbia brachycera (horned spurge) | Ipomopsis congesta (ballhead ipomopsis) | Lepidium[a] (pepperweed) | Lygodesmia grandiflora (largeflower skeletonplant) | Navarretia intertexta[a] (needleleaf navarretia) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 136 | - | 20 | 3 | 3 | 3 | 1 | - | - | 59 | 40 | 3 | 3 | 9 | 25 | 3 | - |
| 2000 | 1 | - | 5 | - | 6 | 4 | - | - | - | - | - | 6 | - | - | - | - | - |
| 2005 | - | - | - | - | 4 | - | 3 | 4 | - | 4 | - | - | - | - | 4 | 7 | 6 |
| 2010 | - | - | - | - | - | - | - | - | 2 | 1 | - | - | - | - | - | - | - |
| 2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8 | 17 | - |
| 2020 | - | 54 | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - |
| 2025 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | 14 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.4 | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - |
| 2000 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - |
| 2005 | - | - | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - | - | - | 0.0 | 0.1 | 0.0 |
| 2010 | - | - | - | - | - | - | - | - | 0.0 | 0.0 | - | - | - | - | - | - | - |
| 2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | 0.1 | - |
| 2020 | - | 0.6 | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| 2025 | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Plantago patagonica[a] (woolly plantain) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 25 | 1 | 18 | 3 | - | 3 | 19 | - | 3 | - |
| 2000 | 24 | - | - | 5 | - | 2 | 7 | - | 1 | - |
| 2005 | 8 | - | 56 | - | 12 | 6 | 43 | - | - | - |
| 2010 | - | - | - | - | - | - | 47 | - | - | - |
| 2015 | - | - | 17 | - | - | - | 119 | 21 | - | 3 |
| 2020 | - | - | 24 | - | - | - | 47 | - | - | 19 |
| 2025 | - | - | 20 | - | 1 | - | 140 | - | - | 15 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.1 | 0.1 | - | 0.0 | - |
| 2000 | 0.1 | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - |
| 2005 | 0.0 | - | 0.4 | - | 0.0 | 0.1 | 0.9 | - | - | - |
| 2010 | - | - | - | - | - | - | 0.3 | - | - | - |
| 2015 | - | - | 0.1 | - | - | - | 1.5 | 0.1 | - | 0.0 |
| 2020 | - | - | 0.0 | - | - | - | 0.7 | - | - | 0.4 |
| 2025 | - | - | 0.1 | - | 0.0 | - | 3.8 | - | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | - | - | - | - |
| 2005 | 2.1 | 0.3 | 2.8 | - | 0.5 |
| 2010 | - | - | - | - | - |
| 2015 | - | - | 2 | - | 0.4 |
| 2020 | - | - | 0.4 | - | 0.7 |
| 2025 | - | - | 0.8 | - | 0.2 |
| year | Quadrat Cover (%) | | | | |
| 1995 | 7.7 | 0.2 | 1.0 | 0.0 | 0.1 |
| 2000 | 5.6 | 0.2 | 12.4 | 0.2 | 0.4 |
| 2005 | 1.5 | 0.4 | 1.9 | - | 0.6 |
| 2010 | - | - | 0.0 | - | 0.3 |
| 2015 | - | 0.0 | 1.6 | - | 0.5 |
| 2020 | - | - | 0.3 | - | 0.1 |
| 2025 | - | - | 0.2 | - | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 3300 | 180 | 17 | 44 | 39 | 50 | 29 | 29 | 42/63 |
| 2000 | 2780 | 20 | 3 | 15 | 82 | 53 | 28 | 50 | 40/61 |
| 2005 | 900 | - | 7 | 22 | 71 | 29 | 44 | 60 | 41/52 |
| 2010 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 68/71 |
| 2015 | - | - | - | - | - | - | - | - | - / - |
| 2020 | - | - | - | - | - | - | - | - | 40/37 |
| 2025 | - | - | - | - | - | - | - | - | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 117/133 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 47/112 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 1020 | 20 | 6 | 84 | 10 | 4 | 4 | 0 | 24/26 |
| 2000 | 500 | - | 0 | 96 | 4 | 12 | 12 | 4 | 12/14 |
| 2005 | 780 | - | 0 | 100 | 0 | 0 | 31 | 0 | 30/31 |
| 2010 | - | - | - | - | - | - | - | - | 23/14 |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 23/19 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 60/48 |
| 2020 | - | - | - | - | - | - | - | - | 73/108 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 3580 | 26560 | 36 | 63 | 1 | 3 | 0 | 0 | 29/32 |
| 2000 | 30120 | - | 1 | 92 | 7 | 0 | 0 | 3 | 20/22 |
| 2005 | 2700 | 220 | 4 | 96 | 1 | 0 | 0 | 0 | 30/32 |
| 2010 | 140 | - | 0 | 86 | 14 | 0 | 0 | 14 | 28/42 |
| 2015 | 2600 | 40 | 6 | 89 | 5 | 9 | 0 | 6 | 21/28 |
| 2020 | 280 | 80 | 0 | 100 | 0 | 0 | 0 | 0 | 25/34 |
| 2025 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 47/37 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/20 |
| 2000 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 10/21 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 440 | - | 0 | 96 | 5 | 0 | 0 | 0 | 11/40 |
| 2000 | 380 | - | 5 | 84 | 11 | 0 | 0 | 0 | 9/33 |
| 2005 | 560 | - | 0 | 79 | 21 | 0 | 0 | 18 | 12/44 |
| 2010 | 320 | - | 0 | 100 | 0 | 0 | 0 | 69 | 13/41 |
| 2015 | 560 | 20 | 7 | 93 | 0 | 18 | 0 | 25 | 13/35 |
| 2020 | 500 | - | 0 | 100 | 0 | 0 | 0 | 4 | 13/39 |
| 2025 | 500 | - | 0 | 92 | 8 | 0 | 0 | 12 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

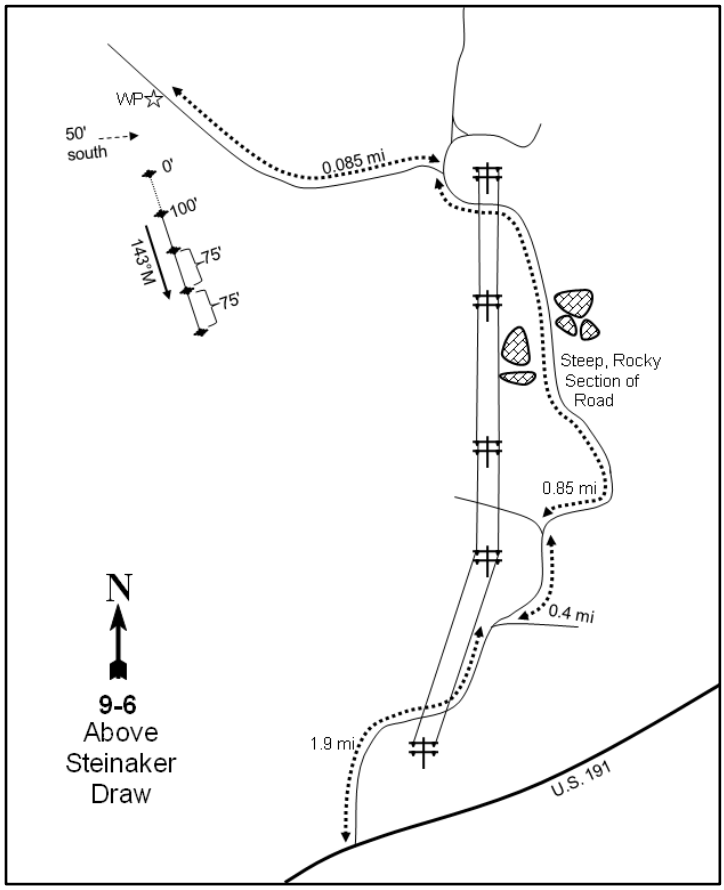
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 19 | - | - | - | - | - | 16.9 |
| 2015 | 8 | - | - | - | 40 | 60 | 42.6 |
| 2020 | 18 | - | - | - | 33 | 67 | 61.7 |
| 2025 | 10 | - | - | - | - | 100 | 58.7 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 10 | - | - | - | 33 | 67 | 48.0 |

**Table 09-05.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 9.9 | 3.4 | 8.4 | 27.4 | -2.3 | 1.7 | 0.0 | **48.5** | Good |
| 2000 | 7.3 | -5.0 | 1.4 | 24.3 | -1.2 | 0.5 | 0.0 | **27.3** | Fair |
| 2005 | 3.0 | 0.0 | 0.0 | 26.7 | -11.6 | 2.0 | 0.0 | **20.1** | Poor |
| 2010 | 0.0 | 0.0 | 0.0 | 6.9 | -0.8 | 0.6 | 0.0 | **6.7** | Very Poor |
| 2015 | 0.0 | 0.0 | 0.0 | 20.9 | -14.7 | 3.3 | 0.0 | **9.5** | Very Poor-Poor |
| 2020 | 0.0 | 0.0 | 0.0 | 23.0 | -20.0 | 1.4 | 0.0 | **4.4** | Very Poor |
| 2025 | 0.0 | 0.0 | 0.0 | 30.0 | -13.8 | 7.7 | 0.0 | **23.9** | Poor-Fair |

# ABOVE STEINAKER DRAW - STUDY NO. 09-6




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steinaker Reservoir ; Township 3S, Range 21E, Section 01 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 626520 East 4493491 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 143° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Turn left off of Highway U.S. 191, one mile north of Steinaker Reservoir. Stay on the dirt road on the right and drive in a northeasterly direction for approximately 1.9 miles. Turn left after crossing under the power lines and go 0.4 miles to a fork at the base of the hill. Proceed up the right fork of the road and follow the power lines. Drive approximately 0.9 miles to the top of a rough, sandy four-wheel drive road. At the top of the hill, the road turns under the power lines where there is a faint road to the west. Walk along this old road for 150 yards to a witness post on the left (southwest) side of the old road; the study site is in the juniper and sagebrush on the south side of the road. The 0-foot baseline stake is 50 feet south of the witness post.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | RED MOUNTAIN |
| Elevation | 6,250ft (1,905m) |
| Aspect | East |
| Slope | 2% |
| Sample Dates | 08/10/1995, 07/19/2000, 07/20/2005, 07/16/2015, 07/06/2020, 06/17/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-06.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 09-06.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase II |
| 1995 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase II |
| 2000 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase II |
| 2005 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase II |
| 2015 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase II |
| 2020 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase II |
| 2025 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II transitioning to Phase III |

## Site Notes

This site was originally established to replace the Steinaker Draw study, which was established in 1982 and sampled a little-utilized desert shrub community type. Spring traps and skinned rabbit pellets were found on the site in the 2015 sample year.

## Soils

**Table 09-06.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loamy Fine Sand | 7.0 | 82.4 | 7.7 | 9.9 | 0.5 | 6.2 | 48.0 | 0.4 | 07/18/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Shallow Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY225UT |
| States and Transitions | 1988-2025 - Juniper Invasion State: Community Phase 3.1 |

Since study establishment in 1988, the vegetation on this site has remained in an invaded state with twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) encroaching upon a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) plant community type (Photos, Pre-1992 Data, Table 09-06.12, Table 09-06.14). The weedy annual grass species cheatgrass (*Bromus tectorum*) increased in abundance and cover over the sample years, but decreased in 2020 and again in 2025 (Table 09-06.10). With the encroachment of pinyon and juniper, the plant community on this site is transitioning to a tree-dominated state. As of 2025, the study is considered to be within Phase II transitioning to Phase III of woodland succession (Table 09-06.4), and sagebrush will likely continue to decrease over time if a tree-removing disturbance does not occur. Should cheatgrass increase again in the future, this site could also be at an increased risk of a catastrophic fire event that could lead to the loss of the remaining beneficial shrubs and forbs to wildlife.

Deer winter range condition has decreased from fair in 1995 to poor-fair in 2025. The decrease in condition quality can be attributed to the removal of preferred browse, and an increase in annual grass cover. Improvement to deer wintering range could be achieved through efforts that increase preferred browse and perennial forb cover. Attention should also be given to the presence of cheatgrass, which can decrease the resistance and resilience of the site to disturbance (Table 09-06.7, Table 09-06.10, Table 09-06.13, Table 09-06.15). Pellet transect data shows that deer presence was high in most sample years. The presence of elk has been considered moderate in most sample years, but it was low in 2000 and 2015 (Table 09-06.9). Utilization of Wyoming big sagebrush has been light to moderate in many years; in 2025, only 13% of big sagebrush plants sampled in density strips were moderately to heavily browsed (Table 09-06.13). On-site observations in 2025 noted little to no utilization on herbaceous species.

## Trend Summary Tables

**Table 09-06.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 13.5 | 3.2 | 2.2 | - | - | - |
| 2000 | 13.5 | 2.3 | 4.0 | - | - | - |
| 2005 | 10.3 | 2.9 | 4.3 | 11.3 | 2.0 | 12.2 |
| 2015 | 7.5 | 1.3 | 4.5 | 10.2 | 0.7 | 14.0 |
| 2020 | 12.5 | 1.1 | 9.0 | 12.2 | 1.0 | 12.7 |
| 2025 | 11.3 | 2.5 | 8.6 | 8.7 | 2.7 | 12.4 |

**Table 09-06.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 352 | 220 | 282 | 145 | 6.2 | 6.0 | 1.4 | 0.6 |
| 2000 | 300 | 128 | 20 | 97 | 5.4 | 3.0 | 0.2 | 2.4 |
| 2005 | 401 | 138 | 125 | 42 | 18.4 | 4.1 | 1.4 | 1.1 |
| 2015 | 443 | 100 | 155 | 73 | 23.4 | 0.4 | 1.5 | 0.6 |
| 2020 | 336 | 144 | 358 | 32 | 7.7 | 3.1 | 8.7 | 0.3 |
| 2025 | 151 | 184 | 376 | 15 | 0.8 | 5.6 | 10.1 | 0.2 |

**Table 09-06.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 20.1 | 11.3 | 48.6 | 0.0 | 0.4 | 35.0 |
| 2000 | 17.4 | 22.9 | 46.1 | - | 0.1 | 31.3 |
| 2005 | 24.0 | 14.0 | 35.4 | - | 0.1 | 38.7 |
| 2015 | 15.5 | 12.9 | 51.2 | - | 0.2 | 37.3 |
| 2020 | 14.1 | 22.4 | 47.5 | - | 0.4 | 38.4 |
| 2025 | 23.9 | 18.0 | 51.3 | 0.0 | 0.0 | 35.0 |

**Table 09-06.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 1 | 39 | 29 | 28 |
| 2000 | - | 18 | 32 | 67 |
| 2005 | - | 46 | 34 | 81 |
| 2015 | - | 18 | 4 | 58 |
| 2020 | - | 31 | 11 | 43 |
| 2025 | - | 31 | 13 | 32 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 6.0 (14.9) | 9.4 (23.2) | - |
| 2005 | 0.7 (1.8) | 57.0 (140.7) | 42.2 (104.3) | - |
| 2015 | - | 46.9 (115.9) | 6.0 (14.9) | - |
| 2020 | - | 83.8 (206.9) | 24.8 (61.2) | - |
| 2025 | - | 38.2 (94.4) | 32.2 (79.5) | - |

**Table 09-06.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 5 | 251 | - | 163 | 37 | 16 | 6 | 44 | 4 | 237 |
| 2000 | - | 293 | - | 68 | 44 | 26 | - | 31 | - | 24 |
| 2005 | 1 | 374 | - | 49 | 43 | 27 | 19 | 47 | 5 | 221 |
| 2015 | 9 | 443 | 5 | 14 | 47 | 17 | - | 13 | 1 | 104 |
| 2020 | 3 | 327 | 1 | 13 | 61 | 3 | - | 78 | 8 | 49 |
| 2025 | 3 | 146 | 4 | 89 | 38 | 8 | 3 | 74 | 23 | 9 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.0 | 5.2 | - | 4.4 | 0.7 | 0.1 | 0.0 | 0.3 | 0.4 | 1.0 |
| 2000 | - | 5.4 | - | 0.7 | 1.4 | 0.3 | - | 0.6 | - | 0.0 |
| 2005 | 0.0 | 14.8 | - | 0.4 | 1.6 | 0.7 | 0.4 | 0.9 | 0.1 | 3.6 |
| 2015 | 0.0 | 22.9 | 0.0 | 0.0 | 0.1 | 0.1 | - | 0.1 | 0.0 | 0.6 |
| 2020 | 0.0 | 7.6 | 0.0 | 0.1 | 1.6 | 0.1 | - | 1.3 | 0.0 | 0.1 |
| 2025 | 0.0 | 0.7 | 0.2 | 1.5 | 2.5 | 0.2 | 0.0 | 0.8 | 0.5 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-06.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Astragalus (milkvetch) | Calochortus nuttallii (sego lily) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha (cryptantha) | Cryptantha[a] (annual cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron (fleabane) | Eriogonum (buckwheat) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 6 | - | 1 | 1 | - | 35 | 45 | 58 | - | - | 53 | 60 | 10 | 6 | 16 | 68 |
| 2000 | - | - | - | - | - | - | - | 2 | - | - | 2 | - | - | 3 | 1 | - | - |
| 2005 | - | - | 2 | - | - | 11 | 30 | 10 | - | - | 13 | 30 | 2 | - | - | 3 | 5 |
| 2015 | 55 | - | - | - | - | - | 18 | - | 5 | 3 | 4 | 20 | 3 | - | - | - | 1 |
| 2020 | 331 | - | - | - | - | 9 | 1 | 1 | - | 3 | 1 | 8 | - | - | - | 4 | 3 |
| 2025 | 368 | - | - | - | - | - | 1 | - | - | - | 5 | 4 | - | - | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | 0.0 | 0.0 | - | 0.1 | 0.1 | 0.2 | - | - | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 |
| 2000 | - | - | - | - | - | - | - | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.0 | - | - |
| 2005 | - | - | 0.0 | - | - | 0.1 | 0.1 | 0.1 | - | - | 0.1 | 0.5 | 0.0 | - | - | 0.0 | 0.0 |
| 2015 | 0.5 | - | - | - | - | - | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.5 | 0.0 | - | - | - | 0.0 |
| 2020 | 8.2 | - | - | - | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.2 | - | - | - | 0.0 | 0.0 |
| 2025 | 10.0 | - | - | - | - | - | 0.0 | - | - | - | 0.2 | 0.0 | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Ipomopsis aggregata (scarlet gilia) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Mentzelia[a] (blazingstar) | Oenothera pallida[a] (pale evening primrose) | Packera multilobata (lobeleaf groundsel) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1995 | 8 | 3 | 87 | 80 | 3 | - | - | - | 4 | 76 | - | - | 27 | - | - | 6 |
| 2000 | - | - | 16 | 2 | 4 | 0 | - | - | - | 86 | - | - | 2 | - | 7 | 8 |
| 2005 | - | - | 48 | 17 | - | - | 7 | 3 | - | 30 | - | - | 11 | 1 | - | - |
| 2015 | - | - | 36 | 37 | - | - | - | 3 | 8 | 67 | - | 8 | 3 | - | - | - |
| 2020 | - | - | 37 | 4 | 1 | - | - | - | - | 25 | - | - | 21 | 3 | - | 3 |
| 2025 | - | - | 35 | - | 0 | - | - | - | - | 6 | 1 | - | - | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.3 | 0.3 | 0.0 | - | - | - | 0.0 | 0.2 | - | - | 0.1 | - | - | 0.0 |
| 2000 | - | - | 0.2 | 0.0 | 0.1 | 0.0 | - | - | - | 2.2 | - | - | 0.0 | - | 0.0 | 0.0 |
| 2005 | - | - | 0.3 | 0.2 | - | - | 0.0 | 0.1 | - | 0.9 | - | - | 0.0 | 0.0 | - | - |
| 2015 | - | - | 0.2 | 0.2 | - | - | - | 0.0 | 0.1 | 0.5 | - | 0.0 | 0.0 | - | - | - |
| 2020 | - | - | 0.1 | 0.0 | 0.0 | - | - | - | - | 0.1 | - | - | 0.0 | 0.1 | - | 0.0 |
| 2025 | - | - | 0.1 | - | 0.0 | - | - | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-06.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Ephedra viridis[p] (mormon tea) | Ericameria nauseosa (rubber rabbitbrush) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia fragilis (brittle pricklypear) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | - | 9.1 | 0.7 | 0 | 0.3 | 2.2 | - | 12.2 | 1 |
| 2015 | - | 8.9 | - | 0.1 | - | 1.2 | - | 14 | 0.7 |
| 2020 | - | 10.1 | - | 0.1 | - | 2 | - | 12.7 | 1 |
| 2025 | - | 6.7 | - | - | - | 2 | 0.1 | 12.4 | 2.6 |
| year | Quadrat Cover (%) | | | | | | | | |
| 1995 | 0.4 | 11.5 | 1.6 | 0.2 | - | 1.5 | 0.0 | 2.2 | 1.5 |
| 2000 | 0.9 | 10.1 | 1.2 | 0.1 | 0.1 | 2.3 | - | 4.0 | 1.0 |
| 2005 | 0.1 | 7.9 | 0.8 | 0.0 | 0.0 | 2.2 | - | 4.3 | 2.1 |
| 2015 | 0.0 | 6.4 | 0.3 | 0.0 | - | 1.1 | - | 4.5 | 1.0 |
| 2020 | 0.1 | 9.3 | 0.2 | 0.0 | - | 3.1 | - | 9.0 | 0.9 |
| 2025 | - | 9.0 | 0.0 | - | 0.4 | 2.3 | 0.0 | 8.6 | 2.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-06.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 17/42 |
| 2000 | 60 | - | 0 | 67 | 33 | 0 | 0 | 33 | 46/64 |
| 2005 | 40 | - | 0 | 50 | 50 | 50 | 0 | 50 | 35/51 |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 21/75 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 33/63 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 2580 | 20 | 16 | 73 | 11 | 14 | 1 | 2 | 64/93 |
| 2000 | 2620 | - | 4 | 64 | 32 | 25 | 1 | 10 | 74/97 |
| 2005 | 1860 | 60 | 1 | 44 | 55 | 38 | 54 | 27 | 77/101 |
| 2015 | 1720 | - | 8 | 42 | 50 | 16 | 9 | 34 | 61/102 |
| 2020 | 1800 | - | 8 | 54 | 38 | 24 | 21 | 40 | 76/110 |
| 2025 | 1400 | - | 1 | 60 | 39 | 9 | 4 | 46 | - / - |
| Cercocarpus ledifolius[P] -- (curl-leaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 72/125 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 97/152 |
| 2005 | - | - | - | - | - | - | - | - | 109/159 |
| 2015 | - | - | - | - | - | - | - | - | 114/176 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 320 | - | 19 | 75 | 6 | 44 | 0 | 0 | 49/54 |
| 2000 | 220 | - | 0 | 91 | 9 | 0 | 0 | 9 | 42/51 |
| 2005 | 100 | - | 0 | 20 | 80 | 20 | 0 | 60 | 44/53 |
| 2015 | 60 | - | 0 | 33 | 67 | 0 | 0 | 67 | 68/82 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 58/78 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1995 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 55/51 |
| 2000 | 60 | - | 0 | 100 | 0 | 67 | 0 | 0 | 51/59 |
| 2005 | 60 | 80 | 0 | 67 | 33 | 0 | 33 | 33 | 56/62 |
| 2015 | 60 | - | 0 | 33 | 67 | 33 | 33 | 100 | 64/90 |
| 2020 | - | - | - | - | - | - | - | - | 54/62 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 71/60 |
| 2005 | 100 | - | 0 | 60 | 40 | 80 | 0 | 20 | 52/46 |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 73/50 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 1995 | 160 | - | 0 | 88 | 13 | 25 | 13 | 13 | 70/118 |
| 2000 | 180 | - | 0 | 22 | 78 | 22 | 0 | 56 | 87/123 |
| 2005 | 160 | - | 0 | 50 | 50 | 0 | 0 | 100 | 78/126 |
| 2015 | 180 | - | 0 | 0 | 100 | 11 | 11 | 100 | 73/121 |
| 2020 | 180 | - | 0 | 89 | 11 | 11 | 0 | 33 | 63/109 |
| 2025 | 140 | - | 0 | 86 | 14 | 0 | 0 | 14 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 420 | - | 0 | 100 | 0 | 71 | 0 | 0 | 30/30 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/23 |
| 2005 | - | - | - | - | - | - | - | - | 24/23 |
| 2015 | 20 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 20/30 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/21 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 100 | - | 0 | 60 | 40 | 0 | 0 | 20 | - / - |
| 2005 | 100 | - | 0 | 60 | 40 | 20 | 0 | 20 | - / - |
| 2015 | 120 | - | 0 | 50 | 50 | 0 | 0 | 67 | - / - |
| 2020 | 100 | - | 20 | 60 | 20 | 0 | 0 | 20 | - / - |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 34/26 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 21/13 |
| 2020 | - | - | - | - | - | - | - | - | 15/33 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 3520 | 40 | 9 | 92 | 0 | 0 | 0 | 0 | 9/27 |
| 2000 | 2580 | 40 | 2 | 88 | 9 | 0 | 0 | 7 | 7/26 |
| 2005 | 5320 | - | 0 | 100 | 0 | 0 | 0 | 87 | 10/25 |
| 2015 | 2740 | - | 4 | 94 | 2 | 2 | 0 | 41 | 10/21 |
| 2020 | 2860 | - | 1 | 99 | 0 | 0 | 0 | 4 | 10/25 |
| 2025 | 2480 | - | 0 | 99 | 1 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | 79/127 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

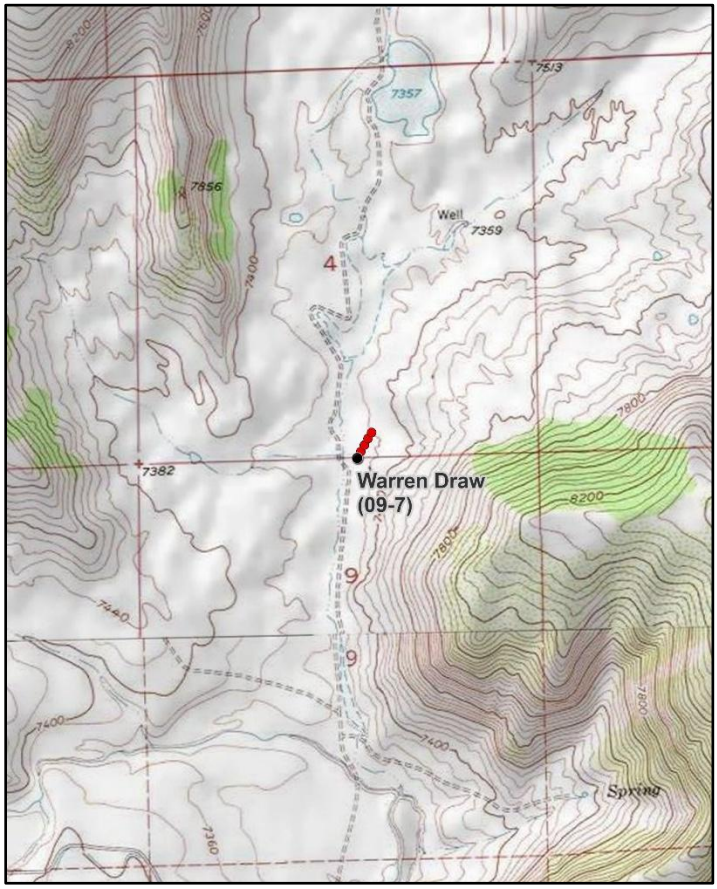
**Table 09-06.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

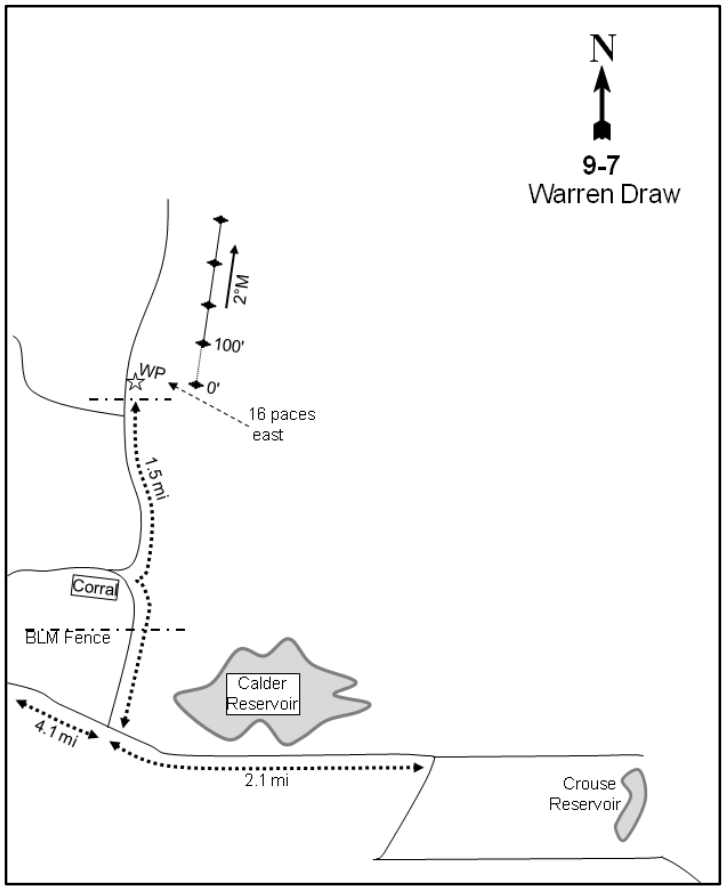
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 98 | - | - | - | - | - | 25.4 |
| 2000 | 61 | - | - | - | - | - | 26.8 |
| 2005 | 97 | - | 5 | 26 | 16 | 53 | 33.8 |
| 2015 | 124 | 5 | 15 | 40 | 35 | 5 | 26.1 |
| 2020 | 125 | - | 10 | 35 | 30 | 25 | 27.3 |
| 2025 | 135 | - | 10 | 35 | 30 | 25 | 36.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 4 | - | - | - | - | - | 7.7 |

**Table 09-06.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 16.5 | 11.5 | 7.1 | 12.0 | -4.6 | 1.2 | 0.0 | **43.7** | Fair-Good |
| 2000 | 16.3 | 3.1 | 1.4 | 6.0 | -4.1 | 4.8 | 0.0 | **27.5** | Fair |
| 2005 | 13.6 | -1.2 | 0.4 | 8.2 | -13.8 | 2.1 | 0.0 | **9.3** | Very Poor-Poor |
| 2015 | 12.5 | -1.8 | 3.5 | 0.9 | -17.6 | 1.1 | 0.0 | **-1.4** | Very Poor |
| 2020 | 14.8 | 4.9 | 3.2 | 6.2 | -5.8 | 0.6 | 0.0 | **23.9** | Poor-Fair |
| 2025 | 10.4 | 5.1 | 0.5 | 11.3 | -0.6 | 0.4 | 0.0 | **27.1** | Fair |

# WARREN DRAW - STUDY NO. 09-7




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Warren Draw SW; Township 1S, Range 24E, Section 09 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 649578 East 4513221 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 531 |
| Transect Bearing | 2° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From the junction between Crouse and Calder Reservoirs, drive west 2.1 miles to an intersection. Turn right (north) and go 1.5 miles past a fence and two forks. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake.

Alternative Route: From the Diamond Mountain turnoff off of U.S. 191, travel east to an intersection just south of Matt Warner Reservoir. Turn right toward Calder Reservoir and proceed 4.1 miles to a fork. Turn left (north) at this fork and travel 1.5 miles while passing through one fence and coming to another. On the other side of the second fence, a boundary between BLM and DWR land, stop and walk 16 paces east to the 0-foot baseline stake.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | WARREN DRAW SOUTH |
| Elevation | 7,340ft (2,237m) |
| Aspect | West |
| Slope | 4-20% |
| Sample Dates | 08/21/1995, 07/27/2000, 07/21/2005, 08/04/2010, 07/08/2015, 07/16/2020, 07/07/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | year-long |

**Table 09-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | No Encroachment |
| 1988 | Mountain Big Sagebrush | No Encroachment |
| 1995 | Mountain Big Sagebrush | No Encroachment |
| 2000 | Mountain Big Sagebrush | No Encroachment |
| 2005 | Mountain Big Sagebrush | No Encroachment |
| 2010 | Mountain Big Sagebrush | No Encroachment |
| 2015 | Mountain Big Sagebrush | No Encroachment |
| 2020 | Mountain Big Sagebrush | No Encroachment |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

The area is used year-round by deer and elk. Sage-grouse also appear frequently in the area. Water is readily available in most years with several stock ponds within one mile of the site.

## Soils

**Table 09-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.6 | 63.4 | 16.7 | 19.9 | 2.1 | 20.4 | 265.6 | 0.8 | 07/27/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1988-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1982, the plant community on this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant species (Pre-1992 Data, Table 09-07.12). The herbaceous understory has remained diverse and abundant. Perennial grasses -- namely Sandberg bluegrass (*Poa secunda*) since 2005 -- have been the dominant herbaceous component in most years. Perennial forbs have also contributed notable cover (Table 09-07.10, Table 09-07.11). Without a major disturbance, this site will likely remain in this or a similar state in future sample years. However, without a disturbance the sagebrush population could increase and reduce the abundance of herbaceous species.

Deer winter range condition has slightly improved from very poor-poor to poor. The increase in condition quality can be attributed to the increase in preferred browse cover. Improvement to deer wintering range could be achieved through efforts that increase preferred browse and perennial forb cover (Table 09-07.6, Table 09-07.7, Table 09-07.15). Pellet transect data shows that deer and elk presence has varied widely over the sample years, but presence has been more pronounced for the mule deer population (Table 09-07.9). During the 2024/25 winter season the area immediately to the northeast of the study (Wagon Hollow) had concentrated occurrences of collared mule deer, but no occurrences on the site itself (Wildlife Migration Initiative).

## Trend Summary Tables

**Table 09-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 20.3 | - | - | - | - | - |
| 2000 | 18.6 | - | - | - | - | - |
| 2005 | 20.4 | - | - | 25.2 | - | - |
| 2010 | 17.3 | - | - | 28.4 | - | - |
| 2015 | 18.1 | - | - | 28.6 | - | - |
| 2020 | 22.5 | - | - | 26.1 | - | - |
| 2025 | 24.4 | - | - | 26.0 | - | - |

**Table 09-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 417 | 271 | 396 | - | 13.3 | 4.2 | 19.6 |
| 2000 | - | 447 | 63 | 367 | - | 15.2 | 0.3 | 15.3 |
| 2005 | - | 416 | 228 | 334 | - | 23.5 | 2.4 | 13.9 |
| 2010 | 3 | 398 | 142 | 255 | 0.0 | 21.3 | 4.6 | 12.8 |
| 2015 | 1 | 444 | 144 | 259 | 0.0 | 29.6 | 0.8 | 5.5 |
| 2020 | - | 438 | 167 | 247 | - | 30.9 | 4.0 | 11.1 |
| 2025 | - | 433 | 17 | 226 | - | 29.6 | 0.2 | 9.5 |

**Table 09-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 13.8 | 1.3 | 50.1 | 0.1 | 0.2 | 53.0 |
| 2000 | 13.8 | 1.2 | 65.9 | 0.1 | 0.1 | 57.5 |
| 2005 | 16.2 | 0.8 | 45.6 | 0.1 | 0.7 | 51.1 |
| 2010 | 19.1 | 0.7 | 41.0 | 0.3 | 0.4 | 54.0 |
| 2015 | 15.9 | 1.6 | 35.8 | 0.1 | 0.1 | 61.0 |
| 2020 | 14.4 | 2.7 | 51.1 | 0.1 | 0.2 | 57.5 |
| 2025 | 13.7 | 3.4 | 43.5 | 0.2 | 0.1 | 53.3 |

**Table 09-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Mule Deer | Rocky Mountain Elk | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | 2 | 10 | 14 | - | 3 |
| 2000 | - | 1 | 24 | 21 | - | 13 |
| 2005 | - | 2 | 39 | 15 | - | 67 |
| 2010 | - | 4 | 13 | 4 | - | 2 |
| 2015 | - | 1 | 14 | 10 | - | 23 |
| 2020 | - | - | 16 | 5 | - | 8 |
| 2025 | - | - | 14 | 14 | - | 8 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 1.3 (3.3) | 0.7 (1.8) | 22.1 (54.6) | 8.1 (19.9) | 1.0 (2.4) | - |
| 2005 | - | 6.5 (16.1) | 78.4 (193.7) | 12.8 (31.5) | - | - |
| 2010 | - | 1.5 (3.6) | 19.4 (48.0) | 1.3 (3.3) | - | - |
| 2015 | - | - | 18.1 (44.7) | 0.7 (1.7) | - | - |
| 2020 | - | 5.8 (14.3) | 53.0 (130.8) | 14.1 (34.8) | - | - |
| 2025 | - | - | 13.4 (33.1) | 13.4 (33.1) | - | - |

**Table 09-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum pinetorum (pine needlegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | 194 | - | - | 32 | 62 | 307 | 30 | 69 | 9 | 93 | 34 | 118 | - |
| 2000 | 151 | - | - | 19 | 13 | 334 | - | 38 | 11 | 171 | 11 | 87 | 5 |
| 2005 | 90 | 3 | - | 8 | 46 | 236 | 1 | 55 | - | 137 | 43 | 261 | - |
| 2010 | 87 | 2 | 3 | 11 | 38 | 196 | 15 | 16 | - | 16 | 11 | 328 | - |
| 2015 | 57 | - | 1 | 12 | 61 | 282 | 33 | 94 | 10 | 32 | 21 | 383 | - |
| 2020 | 76 | 1 | - | 9 | 82 | 207 | 16 | 97 | 20 | 118 | 22 | 250 | - |
| 2025 | 63 | - | - | - | 47 | 252 | 10 | 146 | - | 45 | 14 | 322 | - |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | 4.6 | - | - | 0.1 | 0.9 | 2.5 | 0.3 | 1.7 | 0.0 | 1.5 | 0.4 | 1.1 | - |
| 2000 | 3.6 | - | - | 0.3 | 0.3 | 3.9 | - | 0.7 | 0.1 | 5.1 | 0.2 | 1.0 | 0.1 |
| 2005 | 3.1 | 0.0 | - | 0.0 | 0.5 | 1.7 | 0.0 | 1.9 | - | 4.4 | 1.1 | 11.0 | - |
| 2010 | 3.7 | 0.0 | 0.0 | 0.2 | 0.5 | 2.9 | 0.4 | 0.8 | - | 0.4 | 0.2 | 12.2 | - |
| 2015 | 0.8 | - | 0.0 | 0.1 | 0.9 | 3.9 | 1.3 | 2.9 | 0.3 | 1.4 | 0.8 | 17.3 | - |
| 2020 | 1.3 | 0.0 | - | 0.2 | 2.4 | 4.0 | 1.2 | 4.6 | 0.3 | 6.3 | 1.2 | 9.4 | - |
| 2025 | 1.8 | - | - | - | 0.8 | 4.5 | 0.2 | 9.7 | - | 2.1 | 0.0 | 10.4 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium (onion) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Astragalus aretioides (cushion milkvetch) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cordylanthus[a] (bird's-beak) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 39 | - | 2 | 37 | 209 | - | - | 7 | 1 | 6 | 45 | 119 | 1 | 7 | 1 | - | 171 |
| 2000 | 50 | 5 | 2 | 18 | 219 | - | - | 4 | - | - | 7 | 33 | - | - | - | 3 | 70 |
| 2005 | 28 | 30 | - | 9 | 167 | - | - | 4 | - | 4 | 114 | 118 | - | 0 | - | - | 68 |
| 2010 | 43 | - | - | 14 | 157 | - | - | - | - | - | - | 115 | 1 | - | 3 | - | 23 |
| 2015 | 22 | 2 | - | 130 | 126 | - | - | 1 | - | - | - | 12 | 1 | 3 | 5 | - | - |
| 2020 | 28 | 1 | - | 23 | 141 | - | - | 3 | - | - | 4 | 132 | - | - | - | - | 21 |
| 2025 | 35 | - | - | 2 | - | 79 | 39 | 1 | - | - | - | 12 | - | - | - | - | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.3 | - | 0.0 | 0.1 | 5.5 | - | - | 0.0 | 0.0 | 0.0 | 0.3 | 3.0 | 0.0 | 0.0 | 0.0 | - | 0.6 |
| 2000 | 0.7 | 0.0 | 0.0 | 0.0 | 6.7 | - | - | 0.0 | - | - | 0.0 | 0.2 | - | - | - | 0.0 | 0.4 |
| 2005 | 0.5 | 0.1 | - | 0.0 | 3.1 | - | - | 0.0 | - | 0.0 | 0.3 | 1.7 | - | 0.0 | - | - | 0.6 |
| 2010 | 1.2 | - | - | 0.1 | 4.6 | - | - | - | - | - | - | 4.5 | 0.0 | - | 0.0 | - | 0.1 |
| 2015 | 0.2 | 0.0 | - | 0.6 | 1.9 | - | - | 0.0 | - | - | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - |
| 2020 | 0.4 | 0.0 | - | 0.1 | 5.0 | - | - | 0.0 | - | - | 0.0 | 3.9 | - | - | - | - | 0.1 |
| 2025 | 0.6 | - | - | 0.0 | - | 1.4 | 1.6 | 0.0 | - | - | - | 0.2 | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erigeron flagellaris (trailing fleabane) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Heterotheca villosa (hairy false goldenaster) | Hymenoxys richardsonii (pingue rubberweed) | Lupinus argenteus (silvery lupine) | Mertensia lanceolata (prairie bluebells) | Microsteris gracilis[a] (slender phlox) | Navarretia[a] (pincushionplant) | Oenothera (evening primrose) | Orobanche (broomrape) | Penstemon (beardtongue) | Penstemon acaulis (stemless beardtongue) | Penstemon humilis (low beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 20 | 2 | 4 | 47 | - | 6 | 16 | - | 2 | 1 | - | - | 199 | 85 | 179 | 2 |
| 2000 | 11 | - | - | 3 | 18 | - | 2 | - | - | - | 6 | - | - | 180 | 44 | 13 | 8 |
| 2005 | 7 | 23 | - | - | 29 | 8 | 1 | 26 | 3 | - | 11 | - | - | 144 | 46 | 20 | 8 |
| 2010 | 4 | 2 | - | - | 16 | - | - | - | - | - | - | - | - | 95 | 21 | 11 | 8 |
| 2015 | 1 | - | 5 | - | 4 | 14 | - | - | - | - | - | - | - | 119 | 8 | - | 8 |
| 2020 | 13 | 8 | 2 | - | 20 | 29 | - | 1 | - | - | 10 | 2 | 6 | 94 | 6 | 28 | 6 |
| 2025 | - | - | 2 | - | 18 | 36 | - | - | - | - | - | 3 | - | 92 | 9 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | 0.0 | 0.0 | 1.4 | - | 0.0 | 0.1 | - | 0.0 | 0.0 | - | - | 10.7 | 0.3 | 0.6 | 0.0 |
| 2000 | 0.1 | - | - | 0.0 | 0.6 | - | 0.0 | - | - | - | 0.1 | - | - | 5.9 | 0.1 | 0.0 | 0.0 |
| 2005 | 0.0 | 0.1 | - | - | 1.6 | 0.1 | 0.0 | 0.2 | 0.1 | - | 0.2 | - | - | 5.3 | 0.1 | 0.1 | 0.0 |
| 2010 | 0.0 | 0.0 | - | - | 0.7 | - | - | - | - | - | - | - | - | 5.2 | 0.0 | 0.1 | 0.0 |
| 2015 | 0.0 | - | 0.0 | - | 0.2 | 0.1 | - | - | - | - | - | - | - | 2.7 | 0.0 | - | 0.0 |
| 2020 | 0.2 | 0.0 | 0.0 | - | 0.5 | 0.1 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 4.3 | 0.2 | 0.1 | 0.0 |
| 2025 | - | - | 0.1 | - | 0.4 | 0.2 | - | - | - | - | - | 0.4 | - | 4.7 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Schoenocrambe linifolia (flaxleaf plainsmustard) | Silene drummondii var. drummondii (Drummond's campion) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) | unknown annual forb[a] (unknown forb) | Viola (violet) | Zigadenus elegans (mountain deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | - | 5 | - | 27 | 42 | - | 120 | 3 | - | 3 |
| 2000 | - | - | - | 25 | 18 | 3 | 43 | - | - | 13 |
| 2005 | 3 | - | - | 38 | 51 | 2 | 149 | - | - | - |
| 2010 | 7 | - | 7 | 36 | 35 | 3 | - | - | - | - |
| 2015 | - | - | - | 18 | 12 | - | 90 | - | - | - |
| 2020 | - | 5 | - | 20 | 5 | - | 27 | - | - | 5 |
| 2025 | - | 3 | - | 16 | - | 3 | 8 | - | 11 | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | - | 0.1 | - | 0.1 | 0.1 | - | 0.3 | 0.0 | - | 0.0 |
| 2000 | - | - | - | 0.2 | 0.2 | 0.0 | 0.2 | - | - | 0.1 |
| 2005 | 0.0 | - | - | 0.5 | 0.7 | 0.0 | 0.9 | - | - | - |
| 2010 | 0.2 | - | 0.2 | 0.4 | 0.2 | 0.0 | - | - | - | - |
| 2015 | - | - | - | 0.1 | 0.1 | - | 0.2 | - | - | - |
| 2020 | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 | - | - | 0.0 |
| 2025 | - | 0.0 | - | 0.1 | - | 0.0 | 0.0 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Eriogonum microthecum[p] (slender buckwheat) |
|---|---|---|
| year | Line Intercept | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | 25.2 | - |
| 2010 | 28.4 | - |
| 2015 | 28.6 | - |
| 2020 | 25.9 | 0.2 |
| 2025 | 26 | - |
| year | Quadrat Cover (%) | |
| 1995 | 20.3 | 0.0 |
| 2000 | 18.6 | 0.0 |
| 2005 | 20.2 | 0.2 |
| 2010 | 17.2 | 0.1 |
| 2015 | 17.9 | 0.2 |
| 2020 | 22.4 | 0.1 |
| 2025 | 24.2 | 0.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

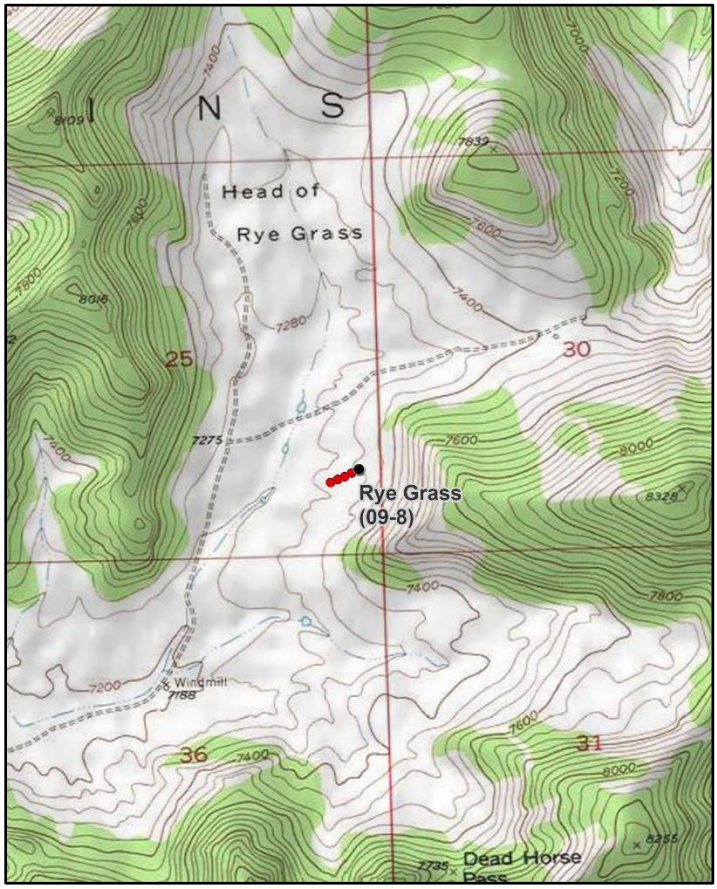
**Table 09-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

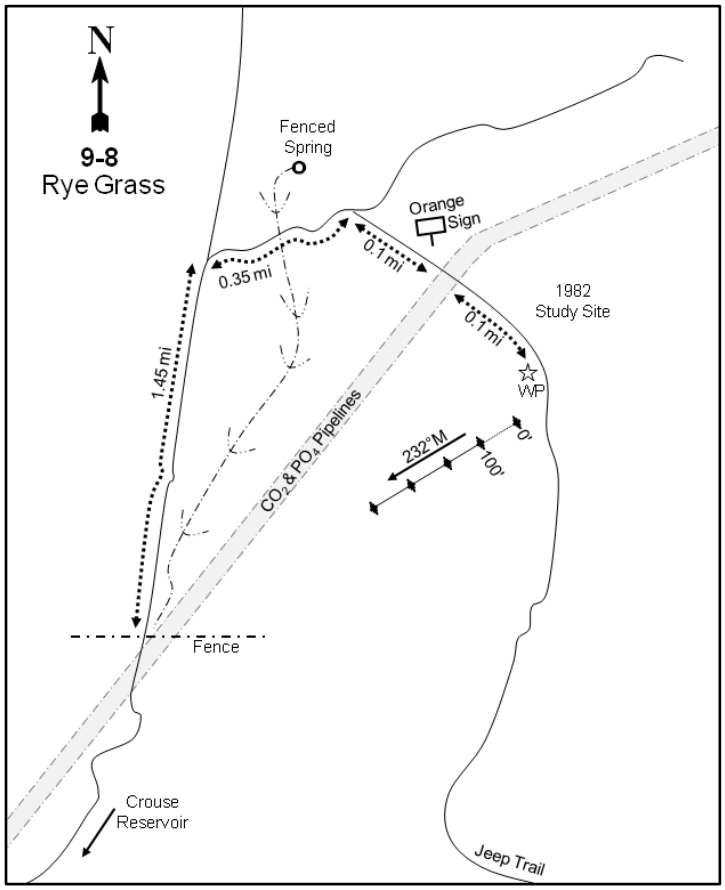
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 24/25 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 17/21 |
| 2025 | 20 | - | 100 | 0 | 0 | 100 | 0 | 0 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/12 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 2/4 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 80 | - | 0 | 100 | 0 | 50 | 25 | 0 | 16/15 |
| 2025 | 320 | - | 13 | 50 | 38 | 0 | 0 | 38 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 7320 | 140 | 13 | 68 | 20 | 30 | 34 | 1 | 41/75 |
| 2000 | 8940 | 80 | 12 | 51 | 37 | 25 | 5 | 13 | 43/74 |
| 2005 | 8220 | 440 | 5 | 53 | 42 | 31 | 24 | 20 | 44/62 |
| 2010 | 6180 | 4800 | 7 | 75 | 18 | 26 | 19 | 14 | 41/71 |
| 2015 | 7060 | 460 | 29 | 43 | 29 | 20 | 40 | 38 | 42/73 |
| 2020 | 6280 | 100 | 16 | 55 | 30 | 31 | 16 | 28 | 43/72 |
| 2025 | 7540 | 180 | 12 | 55 | 34 | 7 | 0 | 35 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 14/23 |
| 2010 | - | - | - | - | - | - | - | - | 23/33 |
| 2015 | - | - | - | - | - | - | - | - | 26/29 |
| 2020 | - | - | - | - | - | - | - | - | 21/27 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Eriogonum microthecum[p] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/34 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 67 | 14/22 |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/22 |
| 2010 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/24 |
| 2015 | 80 | - | 0 | 75 | 25 | 25 | 0 | 0 | 17/28 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 50 | 25 | 9/15 |
| 2025 | 100 | - | 0 | 100 | 0 | 40 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 18/19 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 34/27 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 48/33 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 42/57 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 33/91 |
| 2010 | - | - | - | - | - | - | - | - | 33/101 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# RYE GRASS - STUDY NO. 09-8




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Warren Draw SE; Township 1N, Range 24E, Section 25 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 656471 East 4516987 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 548 |
| Transect Bearing | 240° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Crouse Reservoir, drive north up Mail Draw for 4 miles. Turn right and proceed towards the head of Rye Grass Valley. Go 0.4 miles to a fence, then continue 1.5 miles to a fork. Turn right and proceed 0.4 miles, crossing a wash, then turn right towards a pipeline. Go 0.1 miles to the pipeline. Cross the pipeline and drive back south for 0.1 miles to the study on the right side of the road; this study site is adjacent to the 1982 study area that was removed by a pipeline construction. The 0-foot baseline stake is about 10 feet west of the road. All study stakes are short green fence posts.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | RYE GRASS |
| Elevation | 7,300ft (2,225m) |
| Aspect | Southwest |
| Slope | 8% |
| Sample Dates | 08/22/1995, 07/27/2000, 08/25/2015, 07/15/2020, 07/08/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-08.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | year-long |

**Table 09-08.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Mountain Big Sagebrush | No Encroachment |
| 1995 | Mountain Big Sagebrush | No Encroachment |
| 2000 | Mountain Big Sagebrush | No Encroachment |
| 2015 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 2020 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

There was evidence of year-round use (antler drops, recent deer pellet groups, a winter-killed fawn, elk pellet groups, and remains of a newborn calf) in 1988. This important area was originally sampled by a trend study further up the slope in a mixed sagebrush and mountain mahogany type. The old trend study was disturbed by construction of an underground gas pipeline and was relocated 175 yards to the south in a more open sagebrush/grass flat that is typical of the vegetation in the valley. In 2015, a few old deer shed antlers were found near the site. The hillside to the west of the site was treated by a lop and scatter project (WRI #1693) in June 2011.

## Soils

**Table 09-08.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 6.6 | 67.3 | 12.1 | 20.6 | 1.5 | 7.6 | 92.8 | 0.7 | 07/27/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1988-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1988, the plant community on this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant species; other preferred browse species such as black sagebrush (*A. nova*) and slender buckwheat (*Eriogonum microthecum*) have also been present to a lesser extent (Photos, Pre-1992 Data, Table 09-08.12, Table 09-08.13). The herbaceous understory has remained diverse and abundant. Perennial grasses have contributed a majority of the herbaceous cover and have been a co-dominant vegetation component since 2015. The weedy introduced annual grass species cheatgrass (*Bromus tectorum*) has been present since 2015 with low abundance. The introduced perennial grass species bulbous bluegrass (*Poa bulbosa*) was observed for the first time in 2025, but cover and abundance were low (Table 09-08.7, Table 09-08.10, Table 09-08.11). Rocky Mountain juniper (*Juniperus scopulorum*) and twoneedle pinyon (*Pinus edulis*) were also observed for the first time during the most recent sampling, but density was low (Table 09-08.14). This site will likely remain in this or a similar state without a major disturbance. However, the sagebrush population could also increase without a disturbance and reduce the abundance of herbaceous species.

The abundant grass and forb communities on this site may provide forage for elk (Beck & Peek, 2005) and deer during the summer months (Table 09-08.3, Table 09-08.6). However, pellet transect data indicates that the presence of deer and elk has remained relatively low in most sample years (Table 09-08.9), and on-site observations for 2025 note little to no utilization of the herbaceous understory. During the 2024/25 winter season the site had occasional occurrences of collared mule deer (Wildlife Migration Initiative).

## Trend Summary Tables

**Table 09-08.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 19.5 | 0.9 | - | - | - | - |
| 2000 | 21.1 | 0.9 | - | - | - | - |
| 2015 | 12.8 | 1.0 | - | 22.3 | 1.1 | - |
| 2020 | 17.3 | 0.6 | - | 20.0 | 0.8 | - |
| 2025 | 15.8 | 0.7 | - | 16.9 | 1.0 | - |

**Table 09-08.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 410 | 148 | 308 | - | 10.4 | 1.0 | 9.6 |
| 2000 | - | 370 | 65 | 299 | - | 7.6 | 0.4 | 7.0 |
| 2015 | 90 | 402 | 3 | 238 | 1.7 | 31.5 | 0.2 | 5.6 |
| 2020 | 5 | 400 | 11 | 266 | 0.0 | 27.1 | 0.1 | 13.7 |
| 2025 | 2 | 428 | 1 | 285 | 0.0 | 25.7 | 0.0 | 13.1 |

**Table 09-08.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 26.7 | 0.3 | 40.3 | 2.8 | 1.0 | 37.6 |
| 2000 | 44.1 | 0.4 | 37.5 | 2.4 | 0.9 | 37.5 |
| 2015 | 21.0 | 0.5 | 55.2 | 0.3 | 0.9 | 48.3 |
| 2020 | 26.3 | 0.9 | 43.6 | 0.7 | 0.4 | 47.8 |
| 2025 | 22.7 | 1.7 | 40.9 | 1.2 | 0.7 | 46.6 |

**Table 09-08.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Shiras Moose | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 6 | 25 | 24 | - | 23 |
| 2000 | 2 | 11 | 9 | 1 | 32 |
| 2015 | - | 23 | 2 | - | 36 |
| 2020 | - | 26 | 14 | - | 10 |
| 2025 | - | 34 | 7 | - | 11 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 0.7 (1.8) | 8.7 (21.5) | 14.1 (34.8) | 1.0 (2.4) | - |
| 2015 | - | 15.4 (38.1) | 4.7 (11.6) | 0.5 (1.2) | - |
| 2020 | 0.7 (1.8) | 36.8 (91.0) | 12.1 (29.8) | - | - |
| 2025 | - | 11.4 (28.1) | 5.3 (13.2) | - | - |

**Table 09-08.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 46 | - | - | 5 | 3 | 163 | 164 | 49 | - | 104 | 150 | 157 |
| 2000 | 14 | - | - | 8 | 2 | 211 | 35 | 28 | - | 125 | 66 | 94 |
| 2015 | 11 | - | 90 | 26 | 7 | 86 | 113 | 54 | - | 275 | 85 | 98 |
| 2020 | - | 5 | 5 | 14 | 2 | 49 | 106 | 122 | - | 253 | 105 | 91 |
| 2025 | - | - | 2 | 14 | 1 | 283 | 161 | 114 | 4 | 40 | 229 | 5 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.9 | - | - | 0.5 | 0.0 | 1.4 | 3.4 | 0.3 | - | 0.9 | 1.1 | 1.7 |
| 2000 | 0.1 | - | - | 0.4 | 0.0 | 1.6 | 0.4 | 0.4 | - | 2.5 | 0.4 | 1.8 |
| 2015 | 0.8 | - | 1.7 | 0.3 | 0.1 | 1.8 | 6.5 | 1.2 | - | 14.9 | 1.4 | 4.5 |
| 2020 | - | 0.1 | 0.0 | 0.4 | 0.1 | 0.6 | 4.0 | 3.9 | - | 13.5 | 2.6 | 1.9 |
| 2025 | - | - | 0.0 | 0.2 | 0.0 | 4.5 | 8.8 | 2.9 | 0.1 | 1.1 | 8.1 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-08.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Astragalus argophyllus (silverleaf milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Calochortus nuttallii (sego lily) | Chaenactis douglasii (Douglas' dustymaiden) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 60 | 3 | 3 | 90 | 37 | 9 | 10 | 3 | - | 17 | 1 | 17 | 17 | - | 124 |
| 2000 | - | - | 115 | - | 2 | 84 | 36 | - | 8 | 1 | - | 20 | - | 15 | 4 | 31 | 5 |
| 2015 | - | 3 | 19 | 3 | 3 | 85 | 41 | - | - | - | - | 19 | - | 2 | 2 | 21 | - |
| 2020 | 23 | - | 26 | - | 1 | 79 | 55 | 2 | 7 | - | 2 | 29 | 6 | 41 | 3 | 15 | 3 |
| 2025 | 74 | - | 29 | 8 | - | 71 | 54 | - | 1 | - | - | 58 | - | 19 | - | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 1.2 | 0.0 | 0.0 | 2.3 | 0.3 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.1 | 0.1 | - | 0.4 |
| 2000 | - | - | 2.3 | - | 0.0 | 1.3 | 0.3 | - | 0.0 | 0.0 | - | 0.1 | - | 0.1 | 0.0 | 0.2 | 0.0 |
| 2015 | - | 0.0 | 0.4 | 0.0 | 0.0 | 0.6 | 1.3 | - | - | - | - | 0.1 | - | 0.1 | 0.0 | 0.3 | - |
| 2020 | 0.1 | - | 1.0 | - | 0.0 | 1.6 | 5.2 | 0.0 | 0.1 | - | 0.0 | 0.2 | 0.0 | 0.6 | 0.0 | 0.4 | 0.0 |
| 2025 | 0.4 | - | 0.7 | 0.0 | - | 1.1 | 3.3 | - | 0.0 | - | - | 1.7 | - | 0.6 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Heterotheca villosa (hairy false goldenaster) | Hymenoxys richardsonii (pingue rubberweed) | Ipomopsis aggregata (scarlet gilia) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Microsteris gracilis[a] (slender phlox) | Orthocarpus luteus[a] (yellow owl's-clover) | Packera multilobata (lobeleaf groundsel) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 15 | 11 | 11 | 5 | 1 | - | - | 4 | 2 | - | 2 | 7 | 28 | 9 | 74 | 32 | 78 |
| 2000 | 34 | 24 | 1 | 4 | - | - | 2 | 4 | 9 | - | - | - | 45 | - | 23 | 15 | 71 |
| 2015 | 17 | 14 | 6 | - | - | - | - | - | - | 5 | - | - | 2 | 5 | 22 | 3 | 63 |
| 2020 | 10 | 9 | 5 | - | - | 1 | 2 | 23 | - | 3 | 1 | - | 1 | 4 | 48 | 17 | 71 |
| 2025 | 1 | 12 | 11 | - | - | - | 2 | 14 | - | - | - | - | - | - | 49 | 28 | 45 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.5 | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.5 | 0.0 | 0.6 | 2.6 | 1.2 |
| 2000 | 0.6 | 0.2 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.2 | - | - | - | 0.4 | - | 0.1 | 0.4 | 0.9 |
| 2015 | 0.2 | 0.3 | 0.2 | - | - | - | - | - | - | 0.0 | - | - | 0.1 | 0.0 | 0.3 | 0.0 | 1.1 |
| 2020 | 0.6 | 0.1 | 0.0 | - | - | 0.0 | 0.2 | 0.1 | - | 0.0 | 0.0 | - | 0.0 | 0.1 | 1.1 | 0.7 | 0.8 |
| 2025 | 0.0 | 0.1 | 0.1 | - | - | - | 0.5 | 0.1 | - | - | - | - | - | - | 1.1 | 0.9 | 1.4 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1995 | - | 21 | 42 | - | 17 | 3 | 56 | - |
| 2000 | 2 | 15 | 25 | 1 | 13 | - | 11 | - |
| 2015 | 7 | - | 32 | 7 | - | 1 | 3 | 1 |
| 2020 | - | 4 | 36 | 4 | - | 1 | 6 | 11 |
| 2025 | 5 | - | 25 | - | - | 1 | 22 | 17 |
| year | Average Cover (%) | | | | | | | |
| 1995 | - | 0.0 | 0.3 | - | 0.0 | 0.0 | 0.2 | - |
| 2000 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | - | 0.0 | - |
| 2015 | 0.0 | - | 0.2 | 0.2 | - | 0.0 | 0.0 | 0.0 |
| 2020 | - | 0.0 | 0.5 | 0.1 | - | 0.0 | 0.0 | 0.3 |
| 2025 | 0.0 | - | 0.3 | - | - | 0.0 | 0.2 | 0.4 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-08.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Pediocactus simpsonii (mountain ball cactus) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2015 | 4.8 | 16.4 | 0.2 | 1.1 | 0.9 | - | - |
| 2020 | 3.4 | 16.2 | 0.6 | 0.4 | 0.2 | - | - |
| 2025 | 4 | 12.3 | 0.7 | 0.6 | 0.3 | - | - |
| year | Quadrat Cover (%) | | | | | | |
| 1995 | 2.4 | 15.6 | 0.0 | 1.5 | 0.8 | 0.0 | - |
| 2000 | 1.4 | 19.2 | 0.0 | 0.6 | 0.8 | 0.0 | - |
| 2015 | 2.3 | 9.9 | 0.6 | 0.7 | 0.4 | 0.0 | - |
| 2020 | 3.9 | 12.6 | 0.4 | 0.8 | 0.2 | 0.0 | - |
| 2025 | 4.7 | 9.9 | 0.4 | 1.1 | 0.3 | 0.0 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-08.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | 40 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 100 | 0 | 29/28 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 40/53 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 2680 | 20 | 22 | 75 | 4 | 17 | 2 | 1 | 13/37 |
| 2000 | 2720 | - | 2 | 85 | 14 | 36 | 54 | 4 | 19/39 |
| 2015 | 2660 | 60 | 10 | 88 | 2 | 46 | 6 | 2 | 16/38 |
| 2020 | 3660 | 20 | 4 | 91 | 5 | 15 | 4 | 8 | 12/27 |
| 2025 | 6600 | - | 13 | 55 | 33 | 1 | 0 | 33 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 4900 | 20 | 11 | 74 | 16 | 54 | 5 | 2 | 42/82 |
| 2000 | 5460 | 160 | 6 | 67 | 27 | 29 | 21 | 15 | 45/73 |
| 2015 | 4920 | 20 | 22 | 51 | 28 | 15 | 68 | 27 | 50/83 |
| 2020 | 4240 | 40 | 9 | 53 | 37 | 16 | 43 | 39 | 49/79 |
| 2025 | 4020 | - | 13 | 40 | 47 | 2 | 0 | 48 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 420 | 40 | 33 | 62 | 5 | 5 | 5 | 0 | 17/20 |
| 2000 | 140 | - | 14 | 71 | 14 | 0 | 0 | 0 | 29/32 |
| 2015 | 720 | - | 0 | 97 | 3 | 11 | 8 | 6 | 26/34 |
| 2020 | 680 | - | 3 | 97 | 0 | 3 | 12 | 12 | 26/34 |
| 2025 | 620 | - | 3 | 94 | 3 | 0 | 0 | 3 | - / - |

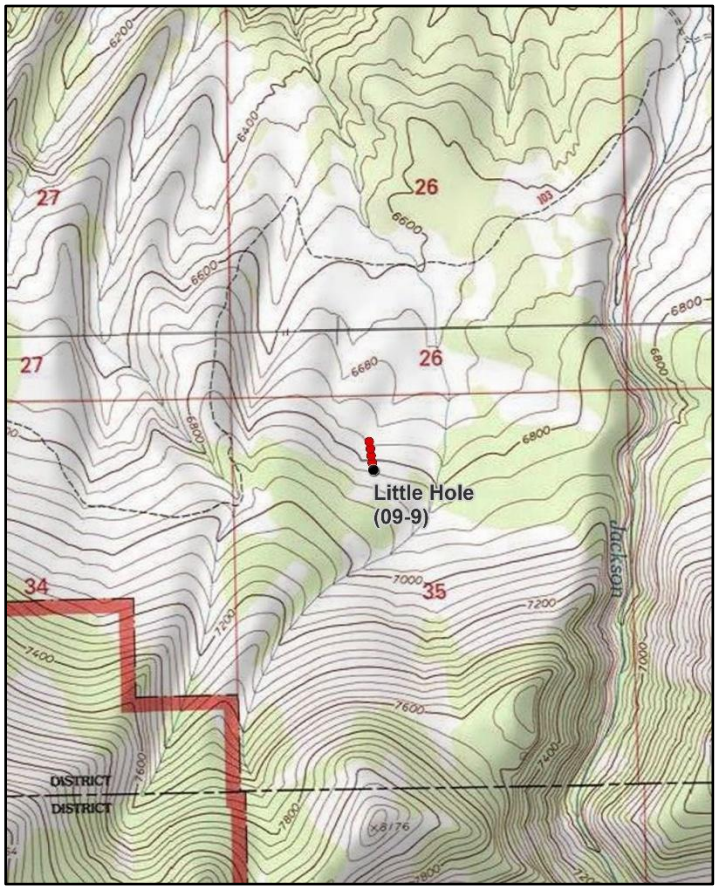
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum microthecum[p] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 3440 | - | 14 | 86 | 0 | 0 | 0 | 0 | 14/17 |
| 2000 | 1800 | - | 4 | 84 | 11 | 0 | 0 | 7 | 13/15 |
| 2015 | 1320 | - | 3 | 97 | 0 | 20 | 11 | 9 | 21/21 |
| 2020 | 1300 | - | 3 | 95 | 2 | 3 | 19 | 3 | 17/16 |
| 2025 | 1600 | 20 | 0 | 100 | 0 | 5 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1620 | 60 | 0 | 100 | 0 | 0 | 0 | 0 | 19/24 |
| 2000 | 3300 | 140 | 32 | 68 | 0 | 0 | 0 | 0 | 11/13 |
| 2015 | 560 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 19/24 |
| 2020 | 1380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/12 |
| 2025 | 1020 | - | 0 | 96 | 4 | 0 | 0 | 4 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/41 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/23 |
| 2015 | 40 | - | 0 | 100 | 0 | 50 | 50 | 0 | 17/26 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 16/32 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/14 |
| 2000 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 4/7 |
| 2015 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | 8/8 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/6 |
| 2025 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 52/133 |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 56/189 |
| 2015 | - | - | - | - | - | - | - | - | 59/117 |
| 2020 | - | - | - | - | - | - | - | - | 62/132 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 27/46 |
| 2020 | - | - | - | - | - | - | - | - | 33/52 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 120 | - | 67 | 33 | 0 | 0 | 0 | 0 | 16/20 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 23/23 |
| 2020 | 60 | - | 0 | 100 | 0 | 33 | 33 | 0 | 24/38 |
| 2025 | 100 | - | 0 | 60 | 40 | 60 | 0 | 40 | - / - |

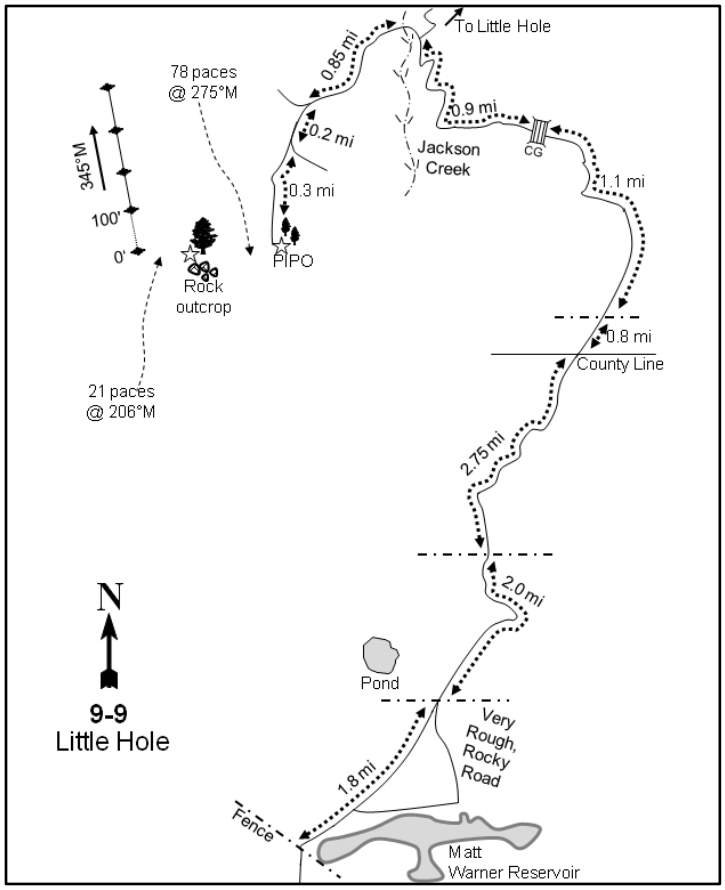
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-08.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 1 | - | 100 | - | - | - | 10.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2025 | 2 | - | 100 | - | - | - | 1.0 |

# LITTLE HOLE - STUDY NO. 09-9




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Jackson Draw NE; Township 2N, Range 23E, Section 35 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 644043 East 4525713 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 345° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 1: No Rebar |

## Directions to Site

From the intersection of Highway U.S. 191 and Diamond Mountain Road, take Diamond Mountain Road north to a fork with a sign that says “Brown’s Park Road 10 miles” and “Vernal 36 miles.” Turn left (north) towards Jackson Draw and proceed down Jackson Draw toward Little Hole. When you get to Matt Warner Reservoir, continue past a fence for 1.8 miles to another fence. Continue on the very rocky road for 2.0 miles to the next fence, passing a pond on the left. Go through this fence and drive 2.8 miles to the county line. Continue 0.8 miles past the county line to another fence. From here, drive 1.1 miles to a cattle guard and continue 0.9 miles to Jackson Creek. Just after crossing Jackson Creek, turn left and proceed 0.9 miles to an intersection. Bear left, then drive 0.2 miles to a fork. Proceed to the right and continue for 0.3 miles to two large ponderosa pine (*Pinus ponderosa*) trees near the road. From the trees, walk southwest at 275 degrees magnetic for 78 paces to a large rock outcropping just below another large ponderosa. From this tree, the 0-foot baseline stake is 21 paces away at 206 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | LITTLE HOLE |
| Elevation | 6,800ft (2,073m) |
| Aspect | North |
| Slope | 20% |
| Sample Dates | 08/24/1995, 07/27/2000, 07/21/2005, 08/04/2010, 06/22/2015, 07/15/2020, 07/08/2025 |

**Table 09-09.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Aerial | Herbicide Treatments - Richard Mtn. and Little Davenport | 5107 | September 2020 | 8513 |
| Hand Crew - Lop and Scatter | Little Davenport Slashing/Lop and Scatter | 3782 | Fall 2017 | 946 |
| Hand Crew - Lop and Scatter | Little Hole Hazardous Fuel Reduction 2006 | LTDL 6755-18626 | Summer-Fall 2007 | 330 |

## Wildlife Habitat and Vegetation History

**Table 09-09.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 09-09.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Phase I |
| 2005 | Mountain Big Sagebrush | Phase I |
| 2010 | Mountain Big Sagebrush | Phase I |
| 2015 | Mountain Big Sagebrush | Phase I transitioning to Phase II |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush/Bitterbrush | Early Phase I |

## Site Notes

This site is managed by the Utah Division of Wildlife Resources (DWR) as part of the Little Hole Wildlife Management Area (WMA). The state section is small and is surrounded by Bureau of Land Management (BLM) lands, which are grazed by cattle as part of the Little Hole allotment. The BLM area to the north of the site was treated in 2007 (Table 09-09.1) to remove twoneedle pinyon (*Pinus edulis*) and juniper (*Juniperus* spp.). Most of the transect was not treated, but several small trees were removed on the lower portion of the transect. Wildlife bedding areas were observed on the site in 2020. No rebar was found for belt 1 in 2025, but it could have been obscured by brush or litter.

## Soils

**Table 09-09.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 6.2 | 61.4 | 18.0 | 20.6 | 2.6 | 6.4 | 153.6 | 0.5 | 07/27/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 1982-1988 - Mountain Big Sagebrush Steppe/Introduced Non-Natives State: Community Phase 2.1<br>1995-2025 - Mountain Big Sagebrush Steppe/Introduced Non-Natives State: Community Phase Undefined |

When this study was established in 1982, the vegetation on this site was a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) community type (Pre-1992 Data). Young conifer trees were scattered across the site that consisted of twoneedle pinyon (*Pinus edulis*), ponderosa pine (*P. ponderosa*), and Rocky Mountain juniper (*Juniperus scopulorum*) (Table 09--09.12); most of the conifer trees were similar in size to the sagebrush plants (Photos). Conifer trees increased in size and abundance over the study period. Following the 2005 sample year, the lower portion of the site was treated with a lop and scatter treatment. The upper portion of the site transitioned to a conifer-encroached sagebrush community type, and antelope bitterbrush (*Purshia tridentata*) was co-dominant with sagebrush in 2025. Much of the juniper and pinyon cover and density was found to be reduced in the 2020 sample year following an additional lop and scatter treatment in 2017 (Table 09-09.1, Table 09-09.12, Table 09-09.13). It is likely that conifer infilling will remain dynamic, and over time the community will continue to experience pressure from further woodland expansion without continued conifer removal.

Deer winter range condition has remained good since 1995. Condition stability can be attributed to persistent preferred browse andperennial grass cover. In 2025, deer winter range condition was considered to be good. Improvement to deer wintering range can been achieved through efforts that increase preferred browse recruitment and perennial forb cover. Attention should be given to the

gradual invasion of annual grass. Although cover and abundance of cheatgrass (*Bromus tectorum*) are low as of 2025, annual grass presence can decrease the resistance and resilience of the site to disturbance (Table 09-09.6, Table 09-09.7, Table 09-09.13, Table 09-09.15). Pellet transect data shows that deer and elk presences have been relatively consistent over the sample period at moderate levels, but an increase in deer presence was noted during the most recent sample year (Table 09-09.9). Utilization of preferred browse species has fluctuated. However, more than 50% of antelope bitterbrush, alderleaf mountain mahogany (*Cercocarpus montanus*), and Utah serviceberry (*Amelanchier utahensis*) plants sampled in density strips were moderately to heavily hedged in 2025 (Table 09-09.13).

## Trend Summary Tables

**Table 09-09.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 26.7 | 0.2 | 2.1 | - | - | - |
| 2000 | 31.7 | 0.1 | 2.2 | - | - | - |
| 2005 | 33.6 | 0.3 | 5.4 | 48.1 | 0.3 | 7.5 |
| 2010 | 32.0 | 0.2 | 3.5 | 48.2 | - | 8.9 |
| 2015 | 29.6 | 0.2 | 8.8 | 40.4 | 0.1 | 11.6 |
| 2020 | 35.1 | 0.7 | 0.2 | 49.6 | 0.3 | 3.2 |
| 2025 | 35.7 | 0.4 | 0.0 | 52.5 | 0.5 | 3.7 |

**Table 09-09.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 54 | 376 | 326 | 187 | 0.5 | 11.3 | 3.2 | 3.3 |
| 2000 | 3 | 405 | 13 | 119 | 0.0 | 20.5 | 0.1 | 2.8 |
| 2005 | 27 | 391 | 196 | 176 | 0.1 | 23.2 | 1.4 | 5.6 |
| 2010 | 28 | 391 | 9 | 112 | 0.5 | 24.9 | 0.1 | 2.9 |
| 2015 | 171 | 402 | 243 | 231 | 6.4 | 33.8 | 3.5 | 7.0 |
| 2020 | 74 | 376 | 155 | 158 | 2.6 | 21.7 | 0.9 | 3.3 |
| 2025 | 19 | 398 | 51 | 92 | 0.4 | 21.3 | 0.2 | 2.2 |

**Table 09-09.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 3.9 | 1.3 | 64.3 | 0.2 | 8.0 | 51.8 |
| 2000 | 8.4 | 2.0 | 66.4 | 0.9 | 5.7 | 55.8 |
| 2005 | 5.8 | 1.0 | 49.3 | 0.1 | 6.8 | 57.5 |
| 2010 | 8.9 | 2.0 | 44.1 | 0.1 | 7.8 | 60.3 |
| 2015 | 6.0 | 2.9 | 66.0 | 0.0 | 6.5 | 66.8 |
| 2020 | 5.8 | 1.2 | 67.8 | 0.0 | 5.5 | 55.3 |
| 2025 | 6.4 | 0.4 | 55.4 | 0.1 | 5.1 | 50.1 |

**Table 09-09.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Shiras Moose | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 7 | 15 | 4 | 1 | 4 |
| 2000 | 7 | 12 | 3 | 1 | 13 |
| 2005 | 10 | 8 | 7 | - | 28 |
| 2010 | 7 | 15 | 5 | - | 2 |
| 2015 | 5 | 7 | 2 | 1 | 29 |
| 2020 | 13 | 7 | 4 | - | 9 |
| 2025 | 10 | 19 | 9 | - | 2 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 9.4 (23.3) | 28.1 (69.5) | 6.0 (14.9) | 1.5 (3.6) | - |
| 2005 | 14.5 (35.9) | 37.5 (92.7) | 9.4 (23.2) | - | - |
| 2010 | 8.7 (21.5) | 26.8 (66.2) | 9.4 (23.2) | 0.5 (1.2) | - |
| 2015 | 14.5 (35.9) | 17.4 (43.0) | 11.4 (28.1) | - | - |
| 2020 | 17.4 (43.0) | 14.1 (34.8) | 14.1 (34.8) | - | - |
| 2025 | 4.4 (10.8) | 48.3 (119.2) | 18.1 (44.7) | - | - |

**Table 09-09.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Juncus arcticus (arctic rush) | Koeleria macrantha (prairie Junegrass) | Melica bulbosa (oniongrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1995 | 9 | - | - | 54 | 9 | 36 | 97 | 61 | - | 5 | 106 | 106 | 164 | 81 | 76 |
| 2000 | 17 | - | - | 3 | 7 | 13 | 131 | 23 | - | - | 49 | 40 | 247 | 28 | 45 |
| 2005 | 26 | - | - | 27 | 1 | 18 | 101 | 101 | - | 13 | 65 | 13 | 276 | 57 | 43 |
| 2010 | 5 | - | - | 28 | 4 | 17 | 139 | 35 | - | 4 | 34 | 11 | 314 | 84 | 13 |
| 2015 | 4 | 9 | - | 171 | 17 | 9 | 101 | 50 | - | 5 | 97 | 45 | 239 | 154 | 24 |
| 2020 | 11 | 30 | 3 | 74 | 14 | 26 | 132 | 80 | - | 2 | 85 | 19 | 102 | 155 | 65 |
| 2025 | 18 | 18 | - | 19 | 11 | 57 | 197 | 61 | 5 | 21 | 102 | 13 | 156 | 104 | 18 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1995 | 0.2 | - | - | 0.5 | 0.2 | 0.4 | 1.2 | 1.0 | - | 0.0 | 1.9 | 1.4 | 3.2 | 1.0 | 0.8 |
| 2000 | 0.4 | - | - | 0.0 | 0.2 | 0.2 | 1.9 | 0.8 | - | - | 0.7 | 0.9 | 14.1 | 0.2 | 1.1 |
| 2005 | 0.7 | - | - | 0.1 | 0.0 | 0.6 | 1.5 | 3.9 | - | 0.2 | 1.9 | 0.3 | 11.5 | 1.5 | 1.0 |
| 2010 | 0.1 | - | - | 0.5 | 0.1 | 0.3 | 4.1 | 0.6 | - | 0.1 | 0.4 | 0.1 | 16.6 | 1.9 | 0.6 |
| 2015 | 0.0 | 0.2 | - | 6.4 | 0.6 | 0.4 | 3.3 | 1.8 | - | 0.5 | 2.9 | 2.2 | 14.9 | 5.5 | 1.3 |
| 2020 | 0.1 | 0.3 | 0.1 | 2.6 | 0.6 | 0.6 | 4.0 | 2.2 | - | 0.1 | 1.3 | 0.8 | 4.9 | 3.8 | 2.9 |
| 2025 | 0.7 | 0.4 | - | 0.4 | 0.1 | 1.5 | 4.2 | 2.2 | 0.8 | 0.8 | 2.9 | 0.4 | 4.5 | 2.0 | 0.8 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-09.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Camelina microcarpa[ai] (littlepod false flax) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron (fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 15 | - | 9 | 3 | 12 | 3 | - | 1 | - | 295 | 118 | 31 | 7 | 7 | 2 | - | - |
| 2000 | 3 | - | 19 | - | 12 | - | - | - | 1 | 11 | - | 27 | - | - | - | - | - |
| 2005 | 23 | 1 | 10 | 5 | 6 | 2 | - | - | - | 181 | 41 | 35 | 3 | 7 | 4 | 3 | - |
| 2010 | 2 | 3 | 20 | - | 5 | - | - | - | - | - | 4 | 49 | - | - | - | - | - |
| 2015 | 37 | 1 | 1 | 10 | 5 | 2 | 6 | - | 4 | 203 | 61 | 38 | 15 | - | 6 | 10 | 9 |
| 2020 | 26 | - | 12 | 4 | 2 | - | 3 | - | - | 125 | 27 | 20 | - | - | - | - | - |
| 2025 | 4 | - | 8 | 3 | 4 | - | - | - | - | 40 | - | 33 | - | - | 1 | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | - | 0.5 | 0.0 | 0.1 | 0.0 | - | 0.1 | - | 2.7 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | - | - |
| 2000 | 0.0 | - | 0.9 | - | 0.4 | - | - | - | 0.0 | 0.0 | - | 0.2 | - | - | - | - | - |
| 2005 | 0.1 | 0.0 | 0.5 | 0.0 | 0.1 | 0.0 | - | - | - | 1.0 | 0.2 | 0.8 | 0.1 | 0.0 | 0.0 | 0.0 | - |
| 2010 | 0.0 | 0.0 | 0.7 | - | 0.1 | - | - | - | - | - | 0.0 | 0.5 | - | - | - | - | - |
| 2015 | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | 2.1 | 0.4 | 0.8 | 0.1 | - | 0.1 | 0.2 | 0.1 |
| 2020 | 0.1 | - | 0.3 | 0.0 | 0.0 | - | 0.0 | - | - | 0.4 | 0.1 | 0.1 | - | - | - | - | - |
| 2025 | 0.0 | - | 0.5 | 0.0 | 0.0 | - | - | - | - | 0.1 | - | 0.8 | - | - | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erigeron divergens[a] (spreading fleabane) | Erigeron eatonii (Eaton's fleabane) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Heterotheca villosa (hairy false goldenaster) | Hymenoxys richardsonii (pingue rubberweed) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Mertensia (bluebells) | Microsteris gracilis[a] (slender phlox) | Navarretia intertexta[a] (needleleaf navarretia) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 1 | 1 | - | 4 | 54 | - | 7 | - | 7 | 4 | 1 | 7 | 39 | - | 4 | - |
| 2000 | - | 8 | - | 2 | - | 43 | - | 6 | - | - | - | 1 | - | 11 | - | 2 | - |
| 2005 | - | 0 | 0 | - | 3 | 31 | - | 0 | - | 4 | 0 | 2 | 7 | 52 | - | 8 | 1 |
| 2010 | - | 2 | - | - | - | 31 | - | 8 | - | 3 | 5 | 0 | - | 24 | - | 1 | - |
| 2015 | 8 | 2 | 5 | 2 | - | 22 | 15 | 6 | 10 | 8 | 2 | 12 | 2 | 32 | 7 | 12 | - |
| 2020 | - | - | - | - | - | 27 | - | 14 | 9 | 3 | - | 0 | - | 13 | 6 | 14 | - |
| 2025 | - | 9 | - | - | - | 15 | - | - | - | - | - | 7 | 2 | - | 3 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | 0.2 | - | 0.0 | 1.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | - | 0.0 | - |
| 2000 | - | 0.0 | - | 0.0 | - | 0.7 | - | 0.1 | - | - | - | 0.0 | - | 0.1 | - | 0.0 | - |
| 2005 | - | 0.0 | 0.0 | - | 0.0 | 1.0 | - | 0.0 | - | 0.0 | 0.0 | 0.2 | 0.0 | 2.1 | - | 0.0 | 0.0 |
| 2010 | - | 0.0 | - | - | - | 1.0 | - | 0.0 | - | 0.0 | 0.0 | 0.1 | - | 0.4 | - | 0.0 | - |
| 2015 | 0.2 | 0.0 | 0.2 | 0.0 | - | 0.3 | 0.2 | 0.1 | 0.2 | 0.1 | 0.0 | 0.5 | 0.0 | 0.9 | 0.0 | 0.0 | - |
| 2020 | - | - | - | - | - | 1.2 | - | 0.1 | 0.2 | 0.0 | - | 0.0 | - | 0.4 | 0.0 | 0.0 | - |
| 2025 | - | 0.0 | - | - | - | 0.4 | - | - | - | - | - | 0.2 | 0.0 | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Orobanche fasciculata (clustered broomrape) | Orogenia linearifolia (Great Basin Indian potato) | Phlox hoodii (spiny phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Silene drummondii (Drummond's campion) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) | Viola (violet) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 5 | - | 2 | 21 | - | 18 | 16 | - | 31 | - | 2 |
| 2000 | - | - | 3 | 8 | - | 14 | - | - | 6 | - | 4 |
| 2005 | 5 | - | 3 | 8 | 2 | 13 | 8 | 0 | 31 | - | 7 |
| 2010 | - | - | 1 | 1 | - | 10 | 2 | 1 | - | - | - |
| 2015 | 3 | 3 | 1 | - | 3 | 17 | 123 | 21 | 48 | 7 | 7 |
| 2020 | 3 | - | 3 | 10 | - | 20 | 50 | 16 | 13 | 5 | 13 |
| 2025 | - | - | - | 7 | - | 11 | - | - | 6 | - | 1 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 0.0 | - | 0.0 | 0.1 | - | 0.1 | 0.1 | - | 0.1 | - | 0.0 |
| 2000 | - | - | 0.1 | 0.0 | - | 0.2 | - | - | 0.0 | - | 0.1 |
| 2005 | 0.1 | - | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.1 | - | 0.1 |
| 2010 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | - |
| 2015 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 | 2.8 | 0.2 | 0.2 | 0.0 | 0.1 |
| 2020 | 0.0 | - | 0.0 | 0.0 | - | 0.2 | 0.7 | 0.1 | 0.0 | 0.0 | 0.1 |
| 2025 | - | - | - | 0.0 | - | 0.1 | - | - | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-09.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Pinus edulis[t] (twoneedle pinyon) | Pinus ponderosa[t] (ponderosa pine) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 1.6 | 9.6 | 3.6 | 0.2 | 0.1 | 1 | - | - | 7.5 | - | 22 | 10.3 | 0 |
| 2010 | 0.4 | 12 | 6.5 | - | - | 1 | - | - | 7.8 | 1.1 | 20.6 | 7.7 | - |
| 2015 | 1.6 | 12.7 | 3.4 | - | 0.1 | 0.3 | - | 0.2 | 9.1 | 2.3 | 15.6 | 6.8 | - |
| 2020 | 1.3 | 9.6 | 3.3 | 0.2 | - | 0.5 | 0.1 | - | 2.6 | 0.6 | 23 | 11.9 | - |
| 2025 | 1.1 | 13.7 | 5.5 | 0.4 | - | 0.2 | 0.1 | - | - | 3.7 | 21.6 | 10.4 | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | |
| 1995 | 0.0 | 14.9 | 1.3 | 0.2 | - | 1.1 | - | - | 1.7 | 0.4 | 7.8 | 1.5 | - |
| 2000 | 0.4 | 16.7 | 1.7 | 0.1 | - | 1.1 | - | - | 2.2 | - | 9.3 | 2.6 | - |
| 2005 | 0.9 | 11.1 | 2.9 | 0.0 | 0.0 | 0.9 | 0.1 | - | 5.4 | - | 13.4 | 4.4 | 0.1 |
| 2010 | 0.0 | 9.3 | 3.4 | 0.0 | - | 0.6 | 0.1 | - | 3.5 | 0.0 | 12.2 | 6.5 | - |
| 2015 | 0.9 | 9.8 | 2.7 | - | 0.0 | 0.4 | 0.2 | 0.0 | 7.5 | 1.4 | 10.9 | 4.9 | - |
| 2020 | 0.4 | 8.3 | 3.2 | 0.3 | - | 1.1 | 0.4 | - | 0.2 | 0.0 | 14.4 | 7.7 | 0.1 |
| 2025 | 0.2 | 10.0 | 3.7 | 0.4 | - | 0.6 | 0.0 | - | 0.0 | 0.0 | 15.0 | 6.2 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-09.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 120 | - | 17 | 83 | 0 | 33 | 0 | 50 | 70/100 |
| 2000 | 120 | - | 33 | 67 | 0 | 17 | 17 | 50 | 92/106 |
| 2005 | 280 | 20 | 36 | 57 | 7 | 50 | 50 | 0 | 90/99 |
| 2010 | 100 | - | 40 | 60 | 0 | 20 | 0 | 0 | 70/77 |
| 2015 | 200 | - | 40 | 40 | 20 | 30 | 40 | 50 | 78/90 |
| 2020 | 120 | - | 0 | 83 | 17 | 17 | 67 | 17 | 77/91 |
| 2025 | 180 | - | 0 | 89 | 11 | 22 | 44 | 11 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 4220 | 20 | 7 | 74 | 19 | 46 | 2 | 4 | 58/86 |
| 2000 | 3320 | 140 | 5 | 48 | 47 | 1 | 0 | 5 | 64/82 |
| 2005 | 2600 | 540 | 2 | 52 | 46 | 26 | 12 | 32 | 70/88 |
| 2010 | 2780 | 160 | 15 | 68 | 17 | 19 | 5 | 19 | 65/82 |
| 2015 | 2720 | 20 | 11 | 74 | 15 | 36 | 9 | 13 | 66/82 |
| 2020 | 2460 | 160 | 16 | 70 | 14 | 12 | 33 | 24 | 59/80 |
| 2025 | 2980 | 680 | 17 | 75 | 8 | 7 | 0 | 8 | - / - |
| Ceanothus fendleri -- (Fendler's ceanothus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 21/58 |
| 2010 | - | - | - | - | - | - | - | - | 30/67 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 380 | 20 | 11 | 90 | 0 | 21 | 11 | 11 | 85/109 |
| 2000 | 280 | - | 21 | 71 | 7 | 29 | 21 | 21 | 89/124 |
| 2005 | 280 | - | 7 | 71 | 21 | 21 | 79 | 0 | 98/110 |
| 2010 | 460 | - | 17 | 83 | 0 | 13 | 26 | 0 | 111/118 |
| 2015 | 300 | 60 | 7 | 93 | 0 | 80 | 13 | 0 | 87/115 |
| 2020 | 380 | - | 5 | 90 | 5 | 26 | 26 | 5 | 96/115 |
| 2025 | 440 | 40 | 18 | 82 | 0 | 5 | 50 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 40/50 |
| 2000 | 180 | - | 22 | 78 | 0 | 0 | 0 | 0 | 37/26 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | 39/46 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 40/57 |
| 2015 | 100 | - | 20 | 60 | 20 | 0 | 0 | 20 | 38/47 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/46 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/49 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/67 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/46 |
| 2015 | 200 | - | 10 | 90 | 0 | 20 | 0 | 0 | 19/25 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum microthecum[p] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 1960 | - | 3 | 97 | 0 | 0 | 0 | 0 | 27/40 |
| 2000 | 1100 | 40 | 9 | 89 | 2 | 2 | 0 | 0 | 23/28 |
| 2005 | 740 | - | 5 | 92 | 3 | 5 | 3 | 0 | 22/31 |
| 2010 | 740 | - | 8 | 92 | 0 | 8 | 0 | 0 | 26/34 |
| 2015 | 180 | 60 | 11 | 89 | 0 | 0 | 0 | 0 | 16/19 |
| 2020 | 720 | 60 | 3 | 97 | 0 | 0 | 47 | 3 | 20/20 |
| 2025 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/29 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/44 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/38 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/18 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/23 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 10/13 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 10/18 |
| 2000 | - | - | - | - | - | - | - | - | 17/55 |
| 2005 | - | - | - | - | - | - | - | - | 15/27 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/41 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/26 |
| 2020 | - | - | - | - | - | - | - | - | 12/28 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 120 | 40 | 33 | 50 | 17 | 0 | 0 | 0 | - / - |
| 2010 | 100 | 40 | 60 | 40 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pinus ponderosa[t] -- (ponderosa pine) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 1780 | 20 | 17 | 82 | 1 | 49 | 1 | 0 | 58/128 |
| 2000 | 1540 | - | 5 | 83 | 12 | 7 | 26 | 4 | 67/126 |
| 2005 | 1860 | - | 5 | 82 | 13 | 42 | 54 | 3 | 62/111 |
| 2010 | 1880 | 40 | 5 | 95 | 0 | 30 | 6 | 0 | 66/114 |
| 2015 | 2180 | 60 | 4 | 88 | 8 | 28 | 56 | 13 | 62/106 |
| 2020 | 1980 | - | 2 | 90 | 8 | 3 | 48 | 9 | 67/111 |
| 2025 | 2440 | 920 | 2 | 91 | 7 | 45 | 16 | 7 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 460 | 20 | 35 | 65 | 0 | 0 | 0 | 0 | 48/102 |
| 2000 | 520 | - | 12 | 89 | 0 | 0 | 0 | 0 | 36/85 |
| 2005 | 1260 | - | 6 | 92 | 2 | 0 | 0 | 8 | 49/92 |
| 2010 | 1860 | - | 16 | 84 | 0 | 0 | 0 | 0 | 48/91 |
| 2015 | 2020 | 80 | 15 | 85 | 0 | 4 | 1 | 1 | 43/87 |
| 2020 | 1560 | 20 | 5 | 94 | 1 | 6 | 0 | 1 | 52/93 |
| 2025 | 2500 | - | 2 | 98 | 0 | 0 | 0 | 1 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 32/57 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 0 | 0 | 42/60 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 44/77 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 44/62 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 42/74 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-09.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

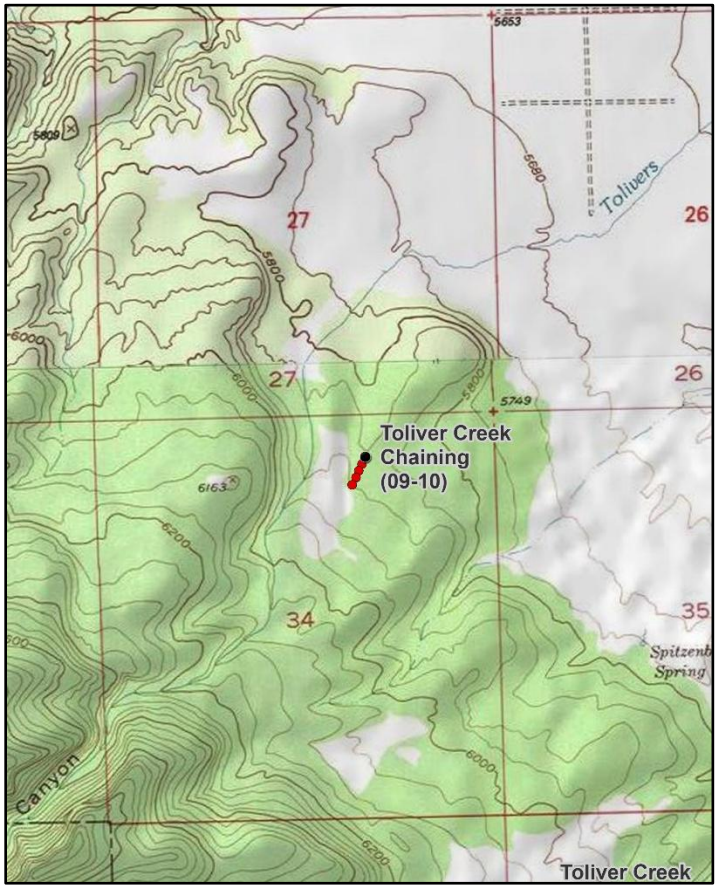
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 1 | - | - | - | - | - | 10.0 |
| 2000 | 4 | - | - | - | - | - | 11.0 |
| 2005 | 4 | - | - | 50 | 25 | 25 | 13.8 |
| 2010 | 4 | - | 25 | - | 50 | 25 | 14.3 |
| 2015 | 2 | - | - | 50 | 50 | - | 18.5 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 2 | - | - | 100 | - | - | 8.0 |
| 2025 | 4 | - | - | 100 | - | - | 8.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 20 | - | - | - | - | - | 5.8 |
| 2000 | 76 | - | - | - | - | - | 9.4 |
| 2005 | 75 | - | 35 | 29 | 24 | 12 | 8.8 |
| 2010 | 95 | 27 | 40 | 13 | 7 | 13 | 5.3 |
| 2015 | 99 | - | 46 | 31 | 15 | 8 | 9.9 |
| 2020 | 11 | - | 100 | - | - | - | 2.8 |
| 2025 | 17 | 14 | 71 | 14 | - | - | 3.6 |

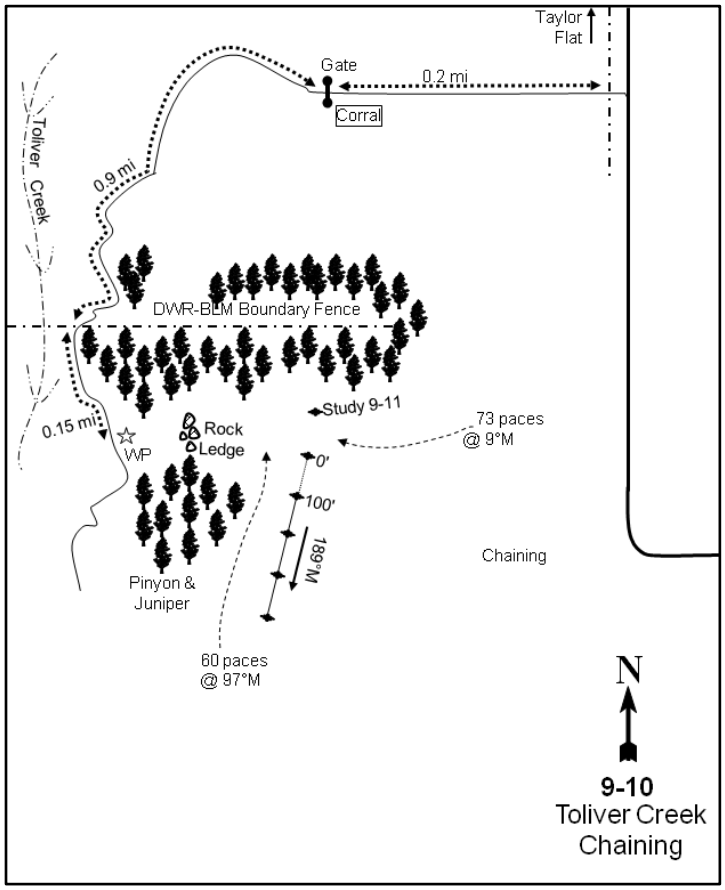
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus ponderosa (ponderosa pine) | | | | | | | |
| 1995 | 6 | - | - | - | - | - | 8.0 |
| 2000 | 10 | - | - | - | - | - | 6.4 |
| 2015 | 12 | - | 13 | 13 | 38 | 38 | 18.8 |
| 2020 | 24 | 18 | - | 9 | 18 | 55 | 17.6 |
| 2025 | 15 | - | - | - | 27 | 73 | 22.5 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 1995 | 3 | - | - | - | - | - | 7.3 |
| 2000 | 1 | - | - | - | - | - | 5.0 |
| 2010 | 2 | - | - | - | - | 100 | 18.0 |
| 2015 | 2 | - | - | - | - | 100 | 20.0 |
| 2020 | 2 | - | - | - | - | 100 | 24.0 |
| 2025 | 2 | - | - | - | - | 100 | 38.0 |

**Table 09-09.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 11.8 | 5.6 | 22.7 | -0.3 | 6.5 | 0.0 | **76.3** | Good |
| 2000 | 30.0 | 6.5 | 3.4 | 30.0 | 0.0 | 5.6 | 0.0 | **75.5** | Good |
| 2005 | 30.0 | 9.7 | 3.1 | 30.0 | -0.1 | 10.0 | 0.0 | **82.7** | Good |
| 2010 | 30.0 | 13.6 | 5.7 | 30.0 | -0.4 | 5.8 | 0.0 | **84.7** | Good |
| 2015 | 30.0 | 12.4 | 4.8 | 30.0 | -4.8 | 10.0 | 0.0 | **82.4** | Good |
| 2020 | 30.0 | 12.8 | 2.8 | 30.0 | -2.0 | 6.5 | 0.0 | **80.1** | Good |
| 2025 | 30.0 | 13.5 | 3.7 | 30.0 | -0.3 | 4.4 | 0.0 | **81.3** | Good |

# TOLIVER CREEK CHAINING - STUDY NO. 09-10




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Warren Draw NW; Township 2N, Range 24E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 652548 East 4526066 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 9096 |
| Transect Bearing | 189° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From the north side of the Green River at the Taylor Flat bridge, go south across the river 1.8 miles. Turn right and go through a gate, then go 0.2 miles to another gate by a corral. Continue south and west while traveling for 0.7 miles to the DWR-BLM boundary fence. Go through the gate and continue 0.2 miles to the end of the road, where there is a pinyon and juniper-covered rocky ledge about 75 feet east. From the ledge, walk 60 paces at 97 degrees magnetic into the chained area to a short green fence post tagged #909 that marks the start of the frequency baseline.

**Note**: A UTV is recommended for accessing this study site.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | TAYLOR FLAT |
| Elevation | 5,900ft (1,798m) |
| Aspect | North |
| Slope | 7% |
| Sample Dates | 08/23/1995, 07/26/2000, 07/27/2005, 07/28/2010, 06/23/2015, 07/15/2020, 07/15/2025 |

**Table 09-10.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Chaining - Two-Way Unknown | - | - | Fall 1986 | - |
| Seeding - Seed Unknown | - | - | Fall 1986 | - |
| Hand Crew - Lop and Scatter | Taylor Flat P/J Removal | 10 | August 2005 | 1040 |
| Hand Crew - Lop and Scatter | Diamond Mountain Maintenance Project | 5105 | August-October 2020 | 2916 |
| Chaining - One-Way Unknown | Browns Park Reseeding 1962 | LTDL 1528-4297 | August 1962-February 1963 | 300 |
| Seeding - Aerial After | Browns Park Reseeding 1962 | LTDL 1528-4298 | August 1962-August 1963 | 300 |

## Wildlife Habitat and Vegetation History

**Table 09-10.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 09-10.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Perennial Grass-Forb | Early Phase I |
| 1995 | Annual Grass/Perennial Grass-Forb | Early Phase I |
| 2000 | Perennial Grass-Forb/Mixed Shrub | Early Phase I |
| 2005 | Perennial Grass-Forb/Mixed Shrub | Early Phase I |
| 2010 | Annual/Perennial Grass-Forb/Mixed Shrub | Early Phase I |
| 2015 | Perennial/Annual Grass-Forb/Mixed Shrub | Early Phase I |
| 2020 | Perennial/Annual Grass-Forb/Mixed Shrub | Early Phase I |
| 2025 | Perennial Grass/Mixed Shrub | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 09-10.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.3 | 69.4 | 17.0 | 13.6 | 4.5 | 14.3 | 288.0 | 0.9 | 08/23/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 9 inches |
| NRCS Ecological Site | Semidesert Stony Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY241UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1988, the plant community was dominated by perennial grasses and forbs (Photos, Pre-1992 Data, Table 09-10.7) following a twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) chaining project (Table 09-10.1). The weedy annual grass species cheatgrass (*Bromus tectorum*) was sampled on the site in moderate abundance. Over the course of the study, cheatgrass has fluctuated in abundance and was a major component of the plant community in many sample years between 1995 and 2020. However, cheatgrass cover and abundance had decreased as of the 2025 sampling, leaving the introduced (and likely seeded during the 1962 Browns Park Reseeding) perennial grass species crested wheatgrass (*Agropyron cristatum*) as the dominant herbaceous component in that year (Table 09-10.10). Shrubs have re-established on the site in the years since study establishment. Pinyon and juniper also infilled in the area, but were removed by a lop and scatter treatment that followed the 2005 reading (Table 09-10.1); the study site has been considered to be in Early Phase I of woodland succession from the outset of the study (Table 09-10.4). Over time, it is predicted that shrubs will become the dominant plant community and will likely consist of the species rubber rabbitbrush (*Ericameria nauseosa* ssp. *nauseosa* var. *hololeuca*), fourwing saltbush (*Atriplex canescens*), and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (Table 09-10.12, Table 09-10.13).

Deer winter range condition has improved from very poor to fair. The increase in condition quality can be attributed to the decrease in annual grass cover and an increase in perennial forb cover; in 2025, deer winter range condition was considered to be fair. Further improvement to deer wintering range can been achieved through efforts that increase preferred browse cover while decreasing the presence of annual grass. Attention should also be given to the presence of cheatgrass, which can decrease the resistance and resilienceof the site to disturbance (Table 09-10.6, Table 09-10.7, Table 09-10.10, Table 09-10.15). Pellet transect data shows that deer and elk presence has varied widely over the sample years. However, presence has been more pronounced for the mule deer

population which was at its highest in 2020 (Table 09-10.9). Over half of Wyoming big sagebrush plants sampled in density strips have shown signs of moderate to heavy utilization since 2010: this can likely be attributed to concentrated browsing due to the limited amount of sagebrush plants (Table 09-10.13).

## Trend Summary Tables

**Table 09-10.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 0.9 | 2.2 | 1.0 | - | - | - |
| 2000 | 1.8 | 0.6 | 0.7 | - | - | - |
| 2005 | 2.3 | 0.5 | 1.8 | 4.4 | 1.0 | 2.7 |
| 2010 | 2.3 | 0.6 | 0.0 | 2.1 | 1.0 | 0.2 |
| 2015 | 2.1 | 1.0 | 0.7 | 2.9 | 1.7 | 0.4 |
| 2020 | 3.1 | 1.4 | 0.4 | 3.0 | 1.4 | 0.4 |
| 2025 | 2.3 | 1.0 | - | 2.8 | 0.9 | - |

**Table 09-10.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 443 | 221 | 190 | 90 | 22.7 | 5.8 | 2.0 | 2.3 |
| 2000 | 166 | 316 | 8 | 45 | 4.7 | 11.2 | 0.0 | 0.3 |
| 2005 | 114 | 308 | 92 | 51 | 0.5 | 17.1 | 2.1 | 0.4 |
| 2010 | 347 | 305 | 5 | 18 | 19.3 | 15.0 | 0.0 | 0.1 |
| 2015 | 432 | 346 | 19 | 40 | 14.0 | 17.1 | 0.2 | 0.3 |
| 2020 | 388 | 344 | 202 | 37 | 14.5 | 22.5 | 3.5 | 0.3 |
| 2025 | 246 | 378 | 102 | 42 | 3.5 | 33.6 | 0.4 | 0.6 |

**Table 09-10.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 5.0 | 0.1 | 53.9 | 0.4 | 22.7 | 38.1 |
| 2000 | 22.1 | 1.7 | 42.2 | 1.2 | 22.2 | 21.6 |
| 2005 | 27.4 | 0.7 | 33.8 | 0.6 | 23.3 | 22.8 |
| 2010 | 11.6 | 1.3 | 55.5 | 0.4 | 22.5 | 38.2 |
| 2015 | 13.2 | 0.8 | 41.7 | 0.8 | 21.3 | 36.3 |
| 2020 | 5.7 | 1.8 | 47.4 | 0.5 | 22.1 | 44.0 |
| 2025 | 11.9 | 1.4 | 40.8 | 0.7 | 22.1 | 36.3 |

**Table 09-10.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 3 | 12 | 7 | 18 |
| 2000 | - | 5 | 13 | 23 | 35 |
| 2005 | - | 3 | 12 | 36 | 82 |
| 2010 | - | 3 | 32 | 12 | 29 |
| 2015 | - | - | 17 | - | 41 |
| 2020 | - | 2 | 35 | 4 | 31 |
| 2025 | - | 1 | 19 | 14 | 20 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 0.7 (1.7) | 2.2 (5.4) | 25.5 (62.9) | 6.7 (16.6) | - |
| 2005 | - | 19.6 (48.4) | 41.5 (102.6) | 67.7 (167.2) | - |
| 2010 | - | 2.9 (7.2) | 32.8 (81.1) | 38.9 (96.0) | - |
| 2015 | - | - | 16.1 (39.7) | - | - |
| 2020 | - | 13.8 (34.1) | 98.5 (243.3) | 3.4 (8.3) | - |
| 2025 | - | 5.1 (12.6) | 25.5 (62.9) | 44.9 (110.9) | - |

**Table 09-10.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Dactylis glomerata[i] (orchardgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Poa bulbosa[i] (bulbous bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | - | 180 | 0 | 443 | 16 | 0 | 21 | - | 1 | 4 | 7 | 29 | 23 |
| 2000 | 2 | 299 | - | 166 | 24 | - | 13 | - | 7 | 30 | 1 | 23 | 4 |
| 2005 | 6 | 294 | 9 | 66 | 0 | 20 | 15 | - | 6 | - | 5 | 15 | 64 |
| 2010 | 5 | 292 | 6 | 344 | 2 | - | - | - | 3 | 1 | 10 | 22 | 19 |
| 2015 | - | 318 | 23 | 380 | 0 | 9 | 2 | - | 2 | - | 7 | 18 | 347 |
| 2020 | - | 334 | 14 | 387 | - | 6 | 3 | - | 26 | - | - | 6 | 47 |
| 2025 | - | 360 | 22 | 229 | - | 5 | 1 | 44 | 30 | 4 | 8 | - | 79 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | - | 4.3 | 0.0 | 22.6 | 0.2 | 0.0 | 0.7 | - | 0.0 | 0.0 | 0.0 | 0.6 | 0.1 |
| 2000 | 0.0 | 9.8 | - | 4.7 | 0.7 | - | 0.1 | - | 0.0 | 0.2 | 0.0 | 0.4 | 0.0 |
| 2005 | 0.1 | 15.9 | 0.1 | 0.3 | 0.0 | 0.4 | 0.1 | - | 0.0 | - | 0.2 | 0.3 | 0.2 |
| 2010 | 0.1 | 13.7 | 0.3 | 19.1 | 0.0 | - | - | - | 0.0 | 0.1 | 0.2 | 0.4 | 0.1 |
| 2015 | - | 14.8 | 1.8 | 7.4 | 0.0 | 0.1 | 0.0 | - | 0.0 | - | 0.1 | 0.3 | 6.7 |
| 2020 | - | 20.3 | 1.1 | 14.4 | - | 0.3 | 0.2 | - | 0.5 | - | - | 0.1 | 0.1 |
| 2025 | - | 30.5 | 1.1 | 3.2 | - | 0.2 | 0.0 | 1.1 | 0.3 | 0.4 | 0.0 | - | 0.3 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-10.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaetopappa ericoides (rose heath) | Chenopodium album[a] (lambsquarters) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cymopterus longipes (longstalk springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba reptans[a] (Carolina draba) | Erodium cicutarium[ai] (redstem stork's bill) | Gilia inconspicua[a] (shy gilia) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Machaeranthera canescens (hoary tansyaster) | Medicago sativa[i] (alfalfa) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 5 | - | 42 | - | - | - | 3 | 21 | 91 | 27 | 19 | 72 | 1 | 7 | 4 | 10 |
| 2000 | - | - | - | 26 | - | - | - | 4 | - | - | 6 | - | - | - | - | - | - |
| 2005 | - | - | - | 25 | 6 | 4 | 2 | 1 | 16 | 3 | 54 | 15 | - | - | 2 | 3 | - |
| 2010 | - | - | - | 15 | - | - | - | - | - | - | - | - | - | 2 | 3 | - | - |
| 2015 | - | - | - | 10 | - | - | - | - | 2 | 2 | 10 | - | - | - | 6 | - | - |
| 2020 | 11 | - | - | 15 | - | - | - | - | - | 3 | 195 | - | - | - | - | - | - |
| 2025 | 27 | - | 4 | 12 | - | - | - | - | 6 | 5 | 74 | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | 0.7 | - | - | - | 0.0 | 0.4 | 0.2 | 0.4 | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.3 |
| 2000 | - | - | - | 0.2 | - | - | - | 0.0 | - | - | 0.0 | - | - | - | - | - | - |
| 2005 | - | - | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 1.9 | 0.0 | - | - | 0.0 | 0.0 | - |
| 2010 | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | 0.0 | 0.0 | - | - |
| 2015 | - | - | - | 0.1 | - | - | - | - | 0.0 | 0.0 | 0.2 | - | - | - | 0.0 | - | - |
| 2020 | 0.0 | - | - | 0.1 | - | - | - | - | - | 0.0 | 3.4 | - | - | - | - | - | - |
| 2025 | 0.0 | - | 0.0 | 0.2 | - | - | - | - | 0.0 | 0.0 | 0.3 | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Melilotus officinalis[i] (sweetclover) | Phlox hoodii (spiny phlox) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) | unknown perennial forb (unknown forb) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1995 | 8 | 6 | 54 | 24 | 7 | 3 |
| 2000 | - | 1 | 2 | 15 | - | - |
| 2005 | - | - | 2 | 28 | - | - |
| 2010 | - | - | - | 3 | - | - |
| 2015 | - | - | - | 30 | - | - |
| 2020 | - | - | 1 | 22 | - | - |
| 2025 | - | - | - | 30 | - | - |
| year | Average Cover (%) | | | | | |
| 1995 | 0.2 | 0.1 | 0.5 | 0.7 | 0.0 | 0.1 |
| 2000 | - | 0.0 | 0.0 | 0.1 | - | - |
| 2005 | - | - | 0.0 | 0.3 | - | - |
| 2010 | - | - | - | 0.0 | - | - |
| 2015 | - | - | - | 0.2 | - | - |
| 2020 | - | - | 0.0 | 0.2 | - | - |
| 2025 | - | - | - | 0.4 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-10.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Echinocereus coccineus (scarlet hedgehog cactus) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 1.7 | 1.1 | - | 0.2 | 1.6 | 0.2 | 2.7 | 0.6 |
| 2010 | 1.1 | 0.5 | - | 0.2 | 0.5 | - | 0.2 | 0.8 |
| 2015 | 1 | 0.8 | - | 0.3 | 1.1 | - | 0.4 | 1.4 |
| 2020 | 1.5 | - | - | 0.1 | 1.5 | 0.6 | 0.4 | 0.7 |
| 2025 | 1.5 | 0.1 | - | 0.3 | 1.2 | 0.2 | - | 0.4 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | 0.3 | 0.1 | - | - | 0.4 | 1.6 | 1.0 | 0.6 |
| 2000 | 1.0 | 0.7 | 0.1 | - | - | 0.4 | 0.7 | 0.3 |
| 2005 | 1.4 | 0.5 | - | 0.2 | 0.3 | 0.1 | 1.8 | 0.3 |
| 2010 | 1.6 | 0.8 | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.4 |
| 2015 | 1.6 | 0.3 | - | 0.2 | 0.1 | 0.2 | 0.7 | 0.7 |
| 2020 | 1.9 | 0.2 | - | 0.2 | 1.0 | 0.1 | 0.4 | 1.0 |
| 2025 | 1.7 | 0.2 | - | 0.3 | 0.4 | 0.1 | - | 0.6 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-10.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 380 | 120 | 74 | 26 | 0 | 11 | 0 | 0 | 33/41 |
| 2000 | 520 | - | 12 | 85 | 4 | 0 | 0 | 0 | 32/46 |
| 2005 | 400 | - | 15 | 85 | 0 | 15 | 10 | 0 | 51/69 |
| 2010 | 420 | - | 10 | 81 | 10 | 43 | 43 | 43 | 45/70 |
| 2015 | 340 | - | 0 | 88 | 12 | 35 | 29 | 18 | 43/68 |
| 2020 | 340 | - | 18 | 71 | 12 | 29 | 29 | 12 | 48/78 |
| 2025 | 320 | - | 19 | 63 | 19 | 63 | 19 | 19 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | 75/100 |
| 2000 | 120 | - | 0 | 100 | 0 | 17 | 0 | 0 | 74/96 |
| 2005 | 100 | - | 0 | 100 | 0 | 20 | 0 | 0 | 97/120 |
| 2010 | 100 | - | 0 | 40 | 60 | 40 | 60 | 80 | 81/96 |
| 2015 | 160 | - | 25 | 38 | 38 | 50 | 0 | 25 | 80/101 |
| 2020 | 40 | - | 0 | 0 | 100 | 50 | 50 | 100 | 67/76 |
| 2025 | 40 | - | 0 | 0 | 100 | 50 | 0 | 100 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 6/19 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Echinocereus coccineus -- (scarlet hedgehog cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 4/7 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 8/15 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/15 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/27 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/29 |
| 2020 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 9/29 |
| 2025 | 100 | - | 40 | 40 | 20 | 0 | 0 | 20 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 71/78 |
| 2000 | 260 | - | 69 | 23 | 8 | 0 | 0 | 0 | 84/109 |
| 2005 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 90/118 |
| 2010 | 60 | - | 0 | 67 | 33 | 67 | 0 | 33 | 92/107 |
| 2015 | 60 | - | 0 | 67 | 33 | 33 | 33 | 33 | 84/102 |
| 2020 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | 100/123 |
| 2025 | 60 | - | 0 | 100 | 0 | 33 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1920 | 80 | 5 | 95 | 0 | 0 | 0 | 0 | 27/44 |
| 2000 | 2120 | - | 1 | 90 | 9 | 0 | 0 | 52 | 11/18 |
| 2005 | 320 | - | 0 | 94 | 6 | 0 | 0 | 6 | 19/28 |
| 2010 | 160 | - | 63 | 38 | 0 | 0 | 0 | 0 | 12/14 |
| 2015 | 200 | - | 10 | 90 | 0 | 0 | 0 | 0 | 16/31 |
| 2020 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/33 |
| 2025 | 320 | - | 13 | 88 | 0 | 0 | 0 | 13 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 120 | - | 83 | 17 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 40 | - | 50 | 0 | 50 | 0 | 0 | 50 | - / - |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 50 | - / - |
| 2020 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 560 | - | 4 | 96 | 0 | 0 | 0 | 0 | 8/30 |
| 2000 | 720 | - | 6 | 92 | 3 | 0 | 0 | 8 | 8/23 |
| 2005 | 760 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 8/26 |
| 2010 | 740 | 20 | 11 | 89 | 0 | 0 | 0 | 11 | 9/32 |
| 2015 | 1100 | - | 9 | 86 | 6 | 9 | 0 | 14 | 10/28 |
| 2020 | 920 | 40 | 7 | 94 | 0 | 0 | 0 | 2 | 9/25 |
| 2025 | 1040 | - | 14 | 73 | 14 | 0 | 0 | 19 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 3/4 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

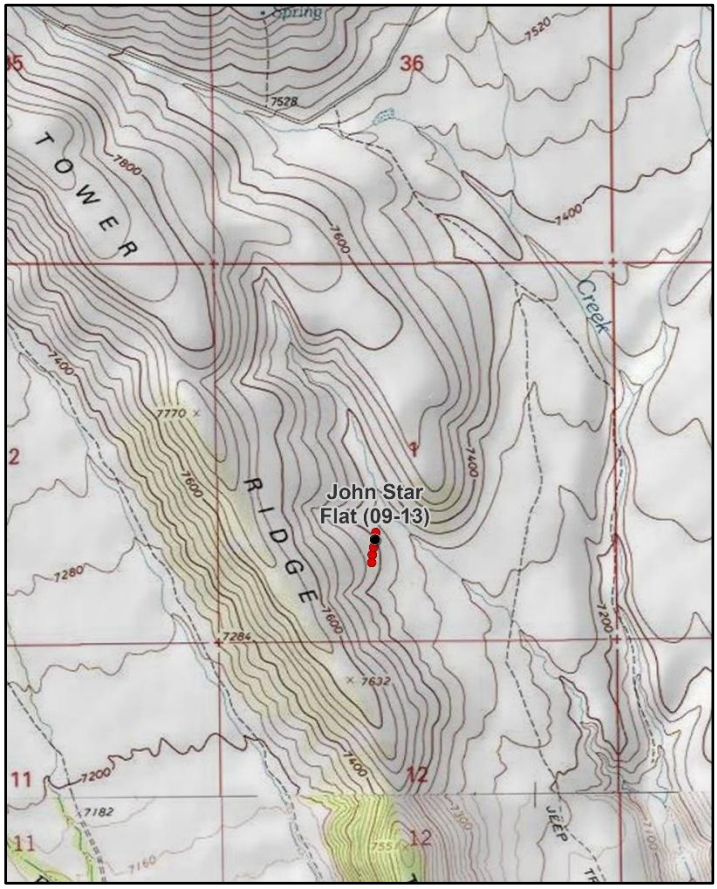
**Table 09-10.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

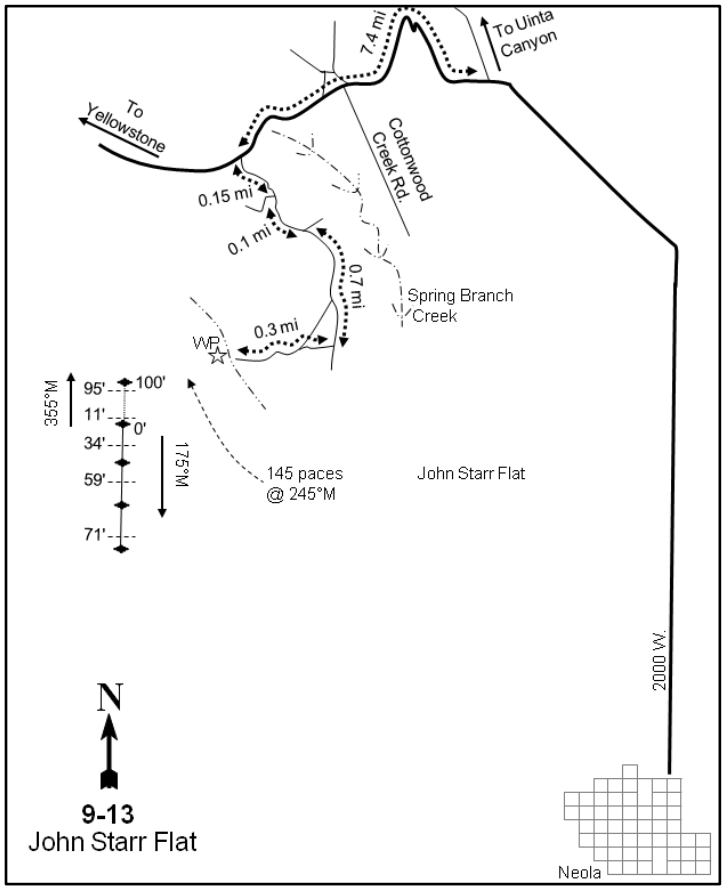
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 11 | - | - | - | - | - | 6.8 |
| 2000 | 43 | - | - | - | - | - | 5.7 |
| 2005 | 32 | - | 50 | 50 | - | - | 5.3 |
| 2010 | 14 | 10 | 80 | 10 | - | - | 2.8 |
| 2020 | 17 | 20 | 70 | 10 | - | - | 3.2 |
| 2025 | 6 | - | 100 | - | - | - | 7.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 1 | - | - | - | - | - | 6.0 |
| 2000 | 16 | - | - | - | - | - | 3.2 |

**Table 09-10.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 1.1 | 0.0 | 0.0 | 11.6 | -17.0 | 4.5 | 0.0 | 0.2 | Very Poor |
| 2000 | 2.2 | 0.0 | 0.0 | 22.4 | -3.6 | 0.5 | 0.0 | 21.5 | Poor |
| 2005 | 5.5 | 0.0 | 0.0 | 30.0 | -0.4 | 0.7 | 0.0 | 35.8 | Fair |
| 2010 | 2.6 | 0.0 | 0.0 | 30.0 | -14.4 | 0.2 | 0.0 | 18.4 | Poor |
| 2015 | 3.6 | 0.0 | 0.0 | 30.0 | -10.5 | 0.7 | 0.0 | 23.8 | Poor-Fair |
| 2020 | 3.8 | 0.0 | 0.0 | 30.0 | -10.9 | 0.6 | 0.0 | 23.5 | Poor-Fair |
| 2025 | 3.5 | 0.0 | 0.0 | 30.0 | -2.6 | 1.2 | 0.0 | 32.1 | Fair |

# JOHN STAR FLAT - STUDY NO. 09-13




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Heller Lake SE; Township 1N, Range 3W, Section 01 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 569913 East 4484610 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7020 |
| Transect Bearing | 2° magnetic (Lines 2-4: 180° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Neola, drive north to a major fork. Turn left (west; the right fork goes to Uinta Canyon) and travel toward Yellowstone for 7.4 miles on the main road. At this point, turn left (south). Go 0.2 miles to a small fork and stay left. Continue 0.1 miles to another fork and bear right. Proceed 1.1 miles to a major fork and continue on the right fork for 0.7 miles. At the next fork turn right toward the hills to the west. Proceed 0.3 miles to the end of the road near a gully. From the end of the road, the 0-foot baseline stake is located 145 paces away at 245 degrees magnetic. Browse tag #7020 is on the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | Tribal |
| Land Administrator | Tribal |
| Allotment | No data |
| Elevation | 7,400ft (2,256m) |
| Aspect | East |
| Slope | 9% |
| Sample Dates | 08/01/1995, 06/28/2000, 07/07/2005, 07/14/2010, 08/12/2020, 07/30/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-13.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |

**Table 09-13.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Alderleaf Mountain Mahogany | Early Phase I |
| 1988 | Alderleaf Mountain Mahogany | Early Phase I |
| 1995 | Alderleaf Mountain Mahogany | Early Phase I |
| 2000 | Alderleaf Mountain Mahogany | Early Phase I |
| 2005 | Alderleaf Mountain Mahogany | Early Phase I |
| 2010 | Alderleaf Mountain Mahogany | Phase I |
| 2020 | Alderleaf Mountain Mahogany | Phase I transitioning to Phase II |
| 2025 | Alderleaf Mountain Mahogany | Phase I transitioning to Phase II |

## Site Notes

No Notes

## Soils

**Table 09-13.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.7 | 67.4 | 16.0 | 16.6 | 3.8 | 4.0 | 134.4 | 0.8 | 06/28/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1982, the plant community on this site has been dominated by alderleaf mountain mahogany (*Cercoarpus montanus*) with the presence of additional browse species such as Utah serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and black sagebrush (*A. nova*). A small number of antelope bitterbrush (*Purshia tridentata*) has also been scattered throughout the community (Photos, Pre-1992 Data, Table 09-13.12, Table 09-13.13). Grasses have been fairly diverse but only moderately abundant with needle-and-thread (*Hesperostipa comata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Ross' sedge (*Carex rossii*) among the most prevalent perennial grass species as of 2025. Cheatgrass (*Bromus tectorum*) has fluctuated over the study years, but has also been abundant at times (Table 09-13.7,Table 09-13.10). Forbs have remained especially diverse, but they contributed little cover in 2025 (Table 09-13.11). Active woodland succession is a concern for this community; size, density, and/or cover have increased over time for Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) (Table 09-13.12, Table 09-13.13, Table 09-13.14). Woodland encroachment will likely continue to the detriment of browse and herbaceous species richness and abundance without conifer reduction measures.

Deer winter range condition has remained good since 1995; condition stability can be attributed to persistently high preferred browse cover. In 2025, deer winter range condition was considered to be fair-good. Improvement to deer wintering range could be achieved through efforts that increase preferred browse recruitment and perennial forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-13.7, Table 09-13.13, Table 09-13.15). Pellet transect data shows that deer and elk presence has varied between low to moderate over the sample period; deer presence was moderate while that of elk was low in 2025 (Table 09-13.9). During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife Migration Initiative). Over 70% of alderleaf mountain mahogany plants sampled in density strips have been moderately to heavily hedged since 1995. Utilization of Utah serviceberry has also been high over time, while that of sagebrush has fluctuated from year to year (Table 09-13.13). However, on-site observations for 2025 note little to no utilization of the herbaceous understory.

## Trend Summary Tables

**Table 09-13.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 20.8 | 2.5 | 0.9 | - | - | - |
| 2000 | 25.1 | 2.4 | 1.0 | - | - | - |
| 2005 | 22.1 | 2.6 | 2.0 | 30.2 | 3.5 | 3.5 |
| 2010 | 21.5 | 2.9 | 1.2 | 31.5 | 3.9 | 4.3 |
| 2020 | 30.6 | 7.0 | 4.8 | 32.9 | 5.6 | 7.6 |
| 2025 | 23.8 | 5.1 | 7.6 | 26.4 | 4.0 | 9.8 |

**Table 09-13.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 72 | 231 | 304 | 309 | 1.3 | 3.8 | 3.2 | 6.7 |
| 2000 | 14 | 292 | 14 | 256 | 0.1 | 14.5 | 0.0 | 9.6 |
| 2005 | 170 | 289 | 282 | 265 | 3.6 | 11.3 | 2.0 | 10.7 |
| 2010 | 59 | 268 | 21 | 240 | 0.5 | 10.6 | 0.3 | 7.1 |
| 2020 | 221 | 244 | 160 | 176 | 4.7 | 12.0 | 0.9 | 5.4 |
| 2025 | 140 | 256 | 81 | 192 | 2.1 | 8.9 | 0.3 | 3.3 |

**Table 09-13.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 13.8 | 0.2 | 46.5 | 1.3 | 9.9 | 40.7 |
| 2000 | 17.5 | 0.2 | 46.5 | 4.2 | 12.0 | 48.3 |
| 2005 | 13.7 | 0.5 | 37.5 | 2.8 | 12.8 | 49.7 |
| 2010 | 12.1 | 0.0 | 45.0 | 4.4 | 11.5 | 44.3 |
| 2020 | 14.8 | 0.5 | 48.4 | 6.1 | 12.6 | 49.5 |
| 2025 | 16.4 | 0.8 | 45.6 | 4.0 | 12.3 | 44.8 |

**Table 09-13.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 23 | 10 | 8 |
| 2000 | - | 19 | 15 | 21 |
| 2005 | - | 18 | 21 | 23 |
| 2010 | - | 13 | 11 | 2 |
| 2020 | - | 26 | 18 | 11 |
| 2025 | - | 28 | 14 | 5 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 46.2 (114.2) | 20.1 (49.7) | - |
| 2005 | 1.5 (3.6) | 17.4 (43.0) | 46.9 (115.9) | - |
| 2010 | - | 25.5 (62.9) | 18.1 (44.7) | - |
| 2020 | - | 44.2 (109.2) | 42.9 (105.9) | - |
| 2025 | - | 27.5 (67.9) | 12.1 (29.8) | - |

**Table 09-13.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 23 | 4 | 72 | 123 | 23 | - | 79 | - | - | 4 | 73 |
| 2000 | 26 | 10 | 14 | 105 | 19 | - | 143 | 5 | 2 | 32 | 83 |
| 2005 | 66 | 12 | 170 | 111 | 43 | 7 | 126 | 4 | 6 | 11 | 54 |
| 2010 | 40 | 5 | 59 | 75 | 29 | - | 145 | 5 | 18 | 7 | 38 |
| 2020 | 28 | 18 | 221 | 67 | 14 | 10 | 86 | - | - | - | 96 |
| 2025 | 10 | 18 | 140 | 70 | 3 | 27 | 66 | 1 | - | 3 | 135 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 0.4 | 0.0 | 1.3 | 1.7 | 0.2 | - | 0.8 | - | - | 0.0 | 0.7 |
| 2000 | 0.8 | 0.3 | 0.1 | 3.6 | 0.3 | - | 6.6 | 0.3 | 0.0 | 0.5 | 2.1 |
| 2005 | 2.2 | 0.2 | 3.6 | 2.7 | 0.4 | 0.0 | 3.9 | 0.2 | 0.1 | 0.0 | 1.5 |
| 2010 | 0.9 | 0.4 | 0.5 | 1.8 | 0.2 | - | 5.0 | 0.3 | 0.2 | 0.0 | 1.8 |
| 2020 | 1.3 | 0.5 | 4.7 | 1.9 | 0.6 | 0.2 | 4.4 | - | - | - | 3.1 |
| 2025 | 0.2 | 0.3 | 2.1 | 1.9 | 0.0 | 0.2 | 1.9 | 0.0 | - | 0.0 | 4.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-13.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Arabis (rockcress) | Arenaria congesta (ballhead sandwort) | Artemisia ludoviciana (white sagebrush) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus spatulatus (tufted milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 49 | - | 23 | 6 | 1 | 126 | - | 3 | 27 | - | 22 | - | 139 | 15 | 4 |
| 2000 | - | - | 1 | 1 | 18 | 1 | - | 118 | - | 4 | 2 | - | 8 | - | 1 | 37 | 1 |
| 2005 | 3 | 2 | 6 | - | 2 | - | 1 | 71 | 1 | 32 | - | - | 4 | 9 | 102 | 15 | 11 |
| 2010 | 6 | 4 | - | 4 | 11 | - | - | 55 | - | 3 | - | - | - | - | 10 | 22 | - |
| 2020 | - | - | 3 | - | 9 | 3 | - | 35 | - | - | - | - | - | 20 | 13 | 9 | - |
| 2025 | - | - | - | - | 10 | - | - | 20 | 2 | 1 | - | 4 | - | 15 | 19 | 1 | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.2 | - | 0.1 | 0.0 | 0.0 | 1.1 | - | 0.0 | 0.1 | - | 0.1 | - | 0.8 | 0.1 | 0.0 |
| 2000 | - | - | 0.0 | 0.0 | 0.3 | 0.0 | - | 2.8 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.3 | 0.0 |
| 2005 | 0.1 | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 2.3 | 0.0 | 0.1 | - | - | 0.0 | 0.0 | 0.7 | 0.2 | 0.3 |
| 2010 | 0.0 | 0.0 | - | 0.0 | 0.1 | - | - | 0.9 | - | 0.0 | - | - | - | - | 0.2 | 0.2 | - |
| 2020 | - | - | 0.0 | - | 0.4 | 0.0 | - | 0.7 | - | - | - | - | - | 0.1 | 0.1 | 0.1 | - |
| 2025 | - | - | - | - | 0.1 | - | - | 0.2 | 0.0 | 0.0 | - | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gilia inconspicua[a] (shy gilia) | Helianthella microcephala (purpledisk helianthella) | Heuchera parvifolia (littleleaf alumroot) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Machaeranthera grindelioides (rayless tansyaster) | Orobanche (broomrape) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 39 | 7 | - | 20 | 64 | 15 | 13 | 14 | - | 80 | 5 | 113 | 191 | 6 | 3 | 19 | 4 |
| 2000 | 4 | 10 | - | - | - | 5 | 18 | 9 | - | 82 | - | 2 | - | - | 1 | 26 | - |
| 2005 | 41 | 21 | 6 | 16 | 32 | - | 1 | - | 5 | 55 | - | 147 | 156 | 5 | 3 | 24 | - |
| 2010 | 21 | 3 | - | - | - | 1 | 6 | 3 | - | 60 | - | 6 | 8 | - | - | 19 | - |
| 2020 | 27 | 5 | - | 25 | - | 5 | - | 3 | - | 32 | 1 | 49 | - | - | - | 8 | - |
| 2025 | 32 | 20 | - | 4 | 1 | - | - | - | - | 36 | - | 38 | 2 | - | - | 12 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.3 | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | - | 1.4 | 0.0 | 0.5 | 1.3 | 0.0 | 0.0 | 0.4 | 0.0 |
| 2000 | 0.0 | 0.1 | - | - | - | 0.0 | 0.2 | 0.1 | - | 1.1 | - | 0.0 | - | - | 0.0 | 0.7 | - |
| 2005 | 0.3 | 0.2 | 0.0 | 0.1 | 0.1 | - | 0.0 | - | 0.0 | 1.8 | - | 0.5 | 0.5 | 0.0 | 0.1 | 0.8 | - |
| 2010 | 0.2 | 0.0 | - | - | - | 0.0 | 0.1 | 0.0 | - | 1.4 | - | 0.0 | 0.0 | - | - | 0.8 | - |
| 2020 | 0.2 | 0.1 | - | 0.3 | - | 0.0 | - | 0.0 | - | 1.0 | 0.0 | 0.1 | - | - | - | 0.0 | - |
| 2025 | 0.3 | 0.1 | - | 0.0 | 0.0 | - | - | - | - | 0.3 | - | 0.1 | 0.0 | - | - | 0.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon caespitosus (mat penstemon) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sedum lanceolatum (spearleaf stonecrop) | Silene drummondii var. drummondii (Drummond's campion) | Sphaeralcea coccinea (scarlet globemallow) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) | Zigadenus elegans (mountain deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | 1 | - | - | 14 | 70 | 59 | 86 | 61 | 23 | 3 | 22 | 1 | - | 13 |
| 2000 | 2 | - | 1 | - | 63 | 31 | 1 | 7 | 14 | - | 11 | - | 4 | 11 |
| 2005 | 3 | - | - | 13 | 53 | 38 | 47 | 56 | 9 | - | 16 | 2 | - | 24 |
| 2010 | - | 2 | - | 12 | 51 | 2 | - | 76 | 21 | - | 21 | 3 | - | 28 |
| 2020 | - | 1 | - | 22 | 33 | 2 | 95 | - | - | - | 24 | 12 | - | 7 |
| 2025 | 1 | - | - | 12 | 18 | 11 | 3 | 58 | - | - | 22 | - | 8 | 10 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | 0.0 | - | - | 0.1 | 1.4 | 0.2 | 0.3 | 0.4 | 0.2 | 0.0 | 0.2 | 0.0 | - | 0.0 |
| 2000 | 0.0 | - | 0.0 | - | 3.1 | 0.2 | 0.0 | 0.0 | 0.1 | - | 0.4 | - | 0.0 | 0.1 |
| 2005 | 0.0 | - | - | 0.1 | 3.1 | 0.2 | 0.1 | 0.4 | 0.1 | - | 0.3 | 0.0 | - | 0.2 |
| 2010 | - | 0.1 | - | 0.2 | 1.7 | 0.0 | - | 0.8 | 0.1 | - | 0.2 | 0.0 | - | 0.2 |
| 2020 | - | 0.0 | - | 0.1 | 1.9 | 0.0 | 0.3 | - | - | - | 0.3 | 0.4 | - | 0.2 |
| 2025 | 0.0 | - | - | 0.1 | 0.6 | 0.1 | 0.0 | 0.7 | - | - | 0.4 | - | 0.1 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-13.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum corymbosum (crispleaf buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 3.7 | 0.1 | 3.4 | 5.7 | 14.3 | - | 0.6 | 0.1 | 1.7 | 2.8 | 0.9 | - | 0.7 | 1 | 2 | 0.2 |
| 2010 | 4.6 | 0.4 | 2.8 | 7.5 | 13.7 | - | 0.1 | 0 | 2.6 | 3.5 | 1.2 | - | 0.8 | 0.8 | 1.7 | - |
| 2020 | 4.6 | 0.1 | 3.4 | 7 | 15.7 | - | 0.7 | - | 4.6 | 5 | 0.2 | - | 2.6 | 0.7 | 1.4 | 0.1 |
| 2025 | 4.1 | 0.3 | 3.2 | 4.8 | 12.6 | - | 0.3 | - | 3 | 6.7 | 0.7 | - | 3.1 | 0.8 | 0.6 | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | | |
| 1995 | 1.3 | - | 1.2 | 5.3 | 11.9 | 0.1 | 0.7 | - | 0.6 | 0.8 | 1.3 | - | 0.0 | 0.5 | 0.5 | - |
| 2000 | 5.8 | 0.1 | 2.9 | 3.9 | 10.1 | 0.0 | 0.4 | 0.0 | 0.4 | 1.0 | 1.5 | 0.0 | - | 0.4 | 1.9 | 0.0 |
| 2005 | 2.8 | 0.2 | 2.2 | 5.1 | 9.6 | 0.0 | 0.4 | 0.0 | 0.6 | 1.7 | 1.7 | 0.0 | 0.3 | 0.2 | 2.0 | 0.0 |
| 2010 | 4.2 | 0.1 | 3.0 | 4.5 | 7.9 | - | 0.2 | 0.0 | 1.3 | 0.6 | 1.3 | - | 0.5 | 0.1 | 1.6 | - |
| 2020 | 4.0 | 0.6 | 2.7 | 8.9 | 13.3 | - | 1.3 | 0.0 | 4.8 | 2.1 | 0.7 | - | 2.7 | 0.2 | 0.8 | 0.2 |
| 2025 | 3.8 | 0.1 | 2.8 | 4.4 | 11.2 | - | 0.7 | - | 3.9 | 4.2 | 0.6 | - | 3.4 | 0.1 | 1.5 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-13.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 640 | - | 28 | 72 | 0 | 41 | 13 | 0 | 64/87 |
| 2000 | 1060 | 60 | 15 | 74 | 11 | 28 | 45 | 34 | 80/97 |
| 2005 | 660 | - | 6 | 46 | 49 | 33 | 58 | 39 | 71/95 |
| 2010 | 900 | - | 24 | 76 | 0 | 38 | 24 | 0 | 63/83 |
| 2020 | 560 | - | 11 | 82 | 7 | 0 | 93 | 39 | 64/74 |
| 2025 | 680 | - | 27 | 68 | 6 | 15 | 59 | 15 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/29 |
| 2005 | 380 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 20/25 |
| 2010 | 460 | - | 0 | 100 | 0 | 48 | 0 | 0 | 27/26 |
| 2020 | 280 | - | 0 | 100 | 0 | 0 | 100 | 36 | 14/15 |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 50 | 50 | - / - |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 1560 | 40 | 17 | 80 | 4 | 51 | 15 | 1 | 22/37 |
| 2000 | 2260 | 260 | 4 | 80 | 16 | 5 | 4 | 8 | 24/40 |
| 2005 | 1640 | 20 | 1 | 95 | 4 | 39 | 13 | 1 | 21/39 |
| 2010 | 2040 | - | 2 | 96 | 2 | 34 | 30 | 2 | 23/42 |
| 2020 | 1380 | - | 1 | 96 | 3 | 25 | 19 | 10 | 25/51 |
| 2025 | 1800 | 60 | 6 | 80 | 14 | 28 | 17 | 21 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1380 | 300 | 22 | 58 | 20 | 49 | 17 | 13 | 57/88 |
| 2000 | 1520 | - | 18 | 51 | 30 | 26 | 5 | 13 | 55/69 |
| 2005 | 1460 | - | 12 | 57 | 30 | 14 | 11 | 11 | 47/70 |
| 2010 | 1580 | - | 13 | 70 | 18 | 48 | 27 | 6 | 48/69 |
| 2020 | 1440 | 20 | 4 | 86 | 10 | 13 | 38 | 13 | 41/69 |
| 2025 | 1040 | 180 | 10 | 69 | 21 | 27 | 2 | 27 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 3580 | 180 | 22 | 77 | 1 | 60 | 30 | 0 | 68/96 |
| 2000 | 3260 | - | 22 | 73 | 6 | 23 | 64 | 20 | 69/99 |
| 2005 | 2420 | - | 20 | 65 | 16 | 19 | 69 | 9 | 73/98 |
| 2010 | 2640 | 40 | 27 | 71 | 2 | 42 | 41 | 2 | 65/95 |
| 2020 | 2340 | 80 | 13 | 86 | 2 | 9 | 72 | 9 | 57/84 |
| 2025 | 3240 | 40 | 4 | 92 | 4 | 33 | 65 | 11 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/33 |
| 2000 | 60 | 20 | 0 | 100 | 0 | 0 | 67 | 0 | 18/34 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/20 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 400 | - | 5 | 95 | 0 | 0 | 5 | 0 | 36/44 |
| 2000 | 320 | - | 0 | 100 | 0 | 6 | 0 | 38 | 30/40 |
| 2005 | 400 | - | 10 | 85 | 5 | 0 | 0 | 0 | 32/45 |
| 2010 | 160 | - | 0 | 100 | 0 | 0 | 0 | 25 | 38/47 |
| 2020 | 240 | - | 0 | 100 | 0 | 42 | 8 | 25 | 26/39 |
| 2025 | 340 | - | 0 | 77 | 24 | 18 | 6 | 65 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/26 |
| 2010 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | 24/35 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 37/35 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. glabrata -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 53/45 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 43/53 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 400 | 60 | 0 | 95 | 5 | 0 | 0 | 0 | 25/30 |
| 2000 | 880 | - | 0 | 96 | 5 | 0 | 0 | 0 | 17/20 |
| 2005 | 1660 | - | 2 | 98 | 0 | 0 | 0 | 0 | 25/28 |
| 2010 | 2000 | - | 1 | 98 | 1 | 0 | 0 | 1 | 23/29 |
| 2020 | 5880 | 20 | 4 | 96 | 0 | 0 | 0 | 0 | 20/26 |
| 2025 | 5460 | - | 2 | 91 | 7 | 0 | 0 | 7 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 80 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 100 | - | 20 | 60 | 20 | 0 | 0 | 20 | - / - |
| 2025 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 5440 | 60 | 11 | 89 | 0 | 0 | 0 | 0 | 6/21 |
| 2000 | 6620 | 200 | 4 | 93 | 2 | 0 | 0 | 1 | 5/15 |
| 2005 | 6260 | - | 3 | 97 | 1 | 0 | 0 | 1 | 6/17 |
| 2010 | 3540 | - | 3 | 97 | 0 | 0 | 0 | 5 | 5/21 |
| 2020 | 1800 | - | 24 | 73 | 2 | 0 | 0 | 2 | 4/11 |
| 2025 | 2220 | 20 | 7 | 89 | 4 | 0 | 0 | 7 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/7 |
| 2000 | 300 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/7 |
| 2005 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | 5/8 |
| 2010 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | 4/8 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 280 | - | 14 | 86 | 0 | 36 | 43 | 0 | 41/95 |
| 2000 | 180 | - | 0 | 100 | 0 | 22 | 67 | 0 | 41/91 |
| 2005 | 80 | - | 0 | 75 | 25 | 0 | 100 | 25 | 42/103 |
| 2010 | 140 | - | 14 | 86 | 0 | 100 | 0 | 0 | 49/128 |
| 2020 | 60 | - | 0 | 67 | 33 | 67 | 0 | 33 | 46/132 |
| 2025 | 100 | - | 20 | 80 | 0 | 0 | 60 | 20 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 320 | 40 | 19 | 81 | 0 | 19 | 13 | 0 | 33/65 |
| 2000 | 860 | - | 14 | 86 | 0 | 2 | 0 | 0 | 19/41 |
| 2005 | 860 | - | 0 | 98 | 2 | 0 | 0 | 2 | 25/44 |
| 2010 | 1680 | - | 17 | 83 | 0 | 0 | 0 | 0 | 25/47 |
| 2020 | 360 | - | 17 | 83 | 0 | 6 | 6 | 0 | 25/46 |
| 2025 | 660 | - | 15 | 85 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 160 | - | 13 | 75 | 13 | 63 | 25 | 0 | 25/35 |
| 2000 | 40 | - | 0 | 0 | 100 | 50 | 50 | 0 | 40/42 |
| 2005 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 15/38 |
| 2010 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 16/31 |
| 2020 | 60 | - | 0 | 67 | 33 | 33 | 33 | 33 | 23/26 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

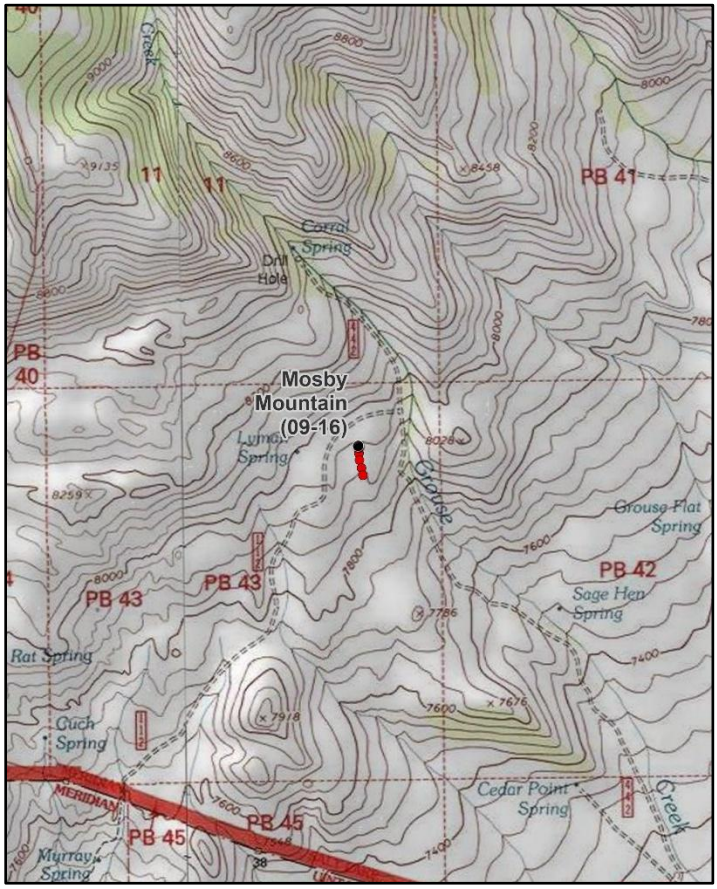
**Table 09-13.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

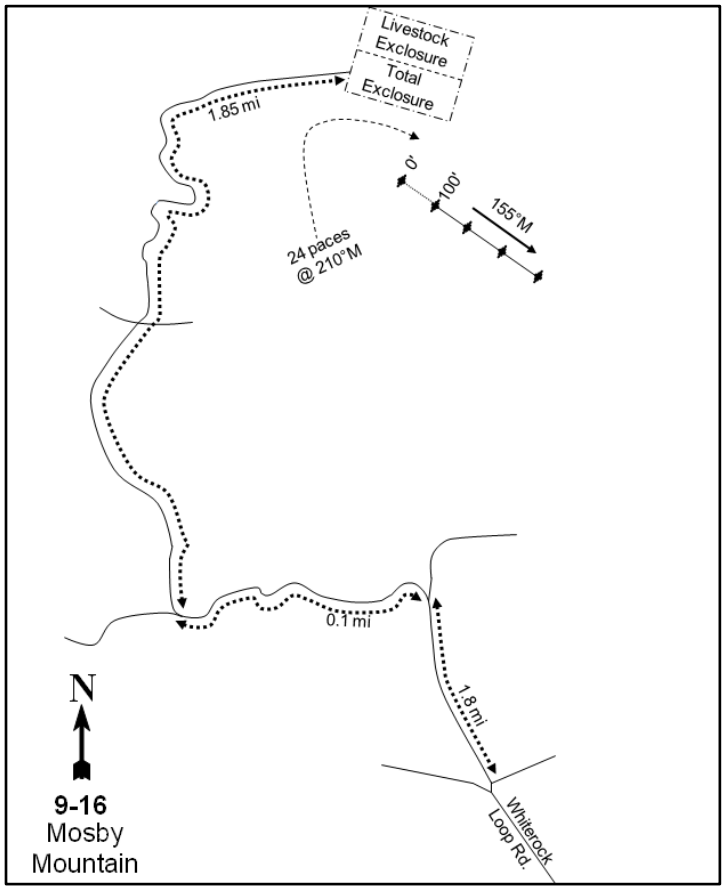
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 30 | - | - | - | - | - | 9.3 |
| 2000 | 38 | - | - | - | - | - | 11.7 |
| 2020 | 25 | - | 42 | 17 | 25 | 17 | 18.3 |
| 2025 | 24 | 8 | 25 | 25 | 33 | 8 | 17.4 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 4 | - | - | - | - | - | 6.7 |
| 2000 | 8 | - | - | - | - | - | 7.3 |
| 2020 | 15 | 9 | 27 | 18 | 36 | 9 | 12.4 |
| 2025 | 15 | 9 | 27 | 45 | 18 | - | 11.1 |

**Table 09-13.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 29.3 | 13.2 | 10.8 | 7.6 | -1.0 | 10.0 | 0.0 | **69.9** | Fair-Good |
| 2000 | 30.0 | 11.5 | 8.3 | 29.1 | 0.0 | 10.0 | 0.0 | **88.9** | Good-Excellent |
| 2005 | 30.0 | 8.8 | 6.3 | 22.7 | -2.7 | 10.0 | 0.0 | **75.1** | Good |
| 2010 | 30.0 | 13.5 | 10.0 | 21.1 | -0.4 | 10.0 | 0.0 | **84.2** | Good |
| 2020 | 30.0 | 13.5 | 4.7 | 24.0 | -3.5 | 10.0 | 0.0 | **78.7** | Good |
| 2025 | 30.0 | 12.4 | 4.8 | 17.7 | -1.6 | 6.6 | 0.0 | **69.9** | Fair-Good |
| 1995 | 29.3 | 13.2 | 10.8 | 7.6 | -1.0 | 10.0 | 0.0 | **69.9** | Fair-Good |

# MOSBY MOUNTAIN - STUDY NO. 09-16




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Lake Mountain SW; Township 3S, Range 18E, Section 43 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 595901 East 4490608 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 795 |
| Transect Bearing | 155° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 96ft), Line 2 (30ft), Line 3 (50ft), Line 4 (72ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the town of Whiterocks, go east on White Rocks Road (11500 North) for approximately 1.8 miles to a "T" in the road. Turn left (north) on White Rocks Loop Road (5500 East) and go 3.5 miles to an intersection where two roads fork off to the right. Turn right and then take the left fork. Travel north for approximately 1.9 miles to a two-track on the left (west) side of the road. Turn left and drive 0.1 miles to another fork. Take the right fork and drive 1.9 miles to the Mosby Mountain Exclosure. The 0-foot baseline stake is marked with browse tag #795 and is located 24 paces from the southwest corner of the big game exclosure at a bearing of 210 degrees magnetic. This site may also be accessed from the east by traveling north through Tridell on 8000 East: go through the reservation and then travel west to Mosby Mountain.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | MOSBY MOUNTAIN |
| Elevation | 7,900ft (2,408m) |
| Aspect | South |
| Slope | 8-10% |
| Sample Dates | 08/02/1995, 07/18/2000, 07/12/2005, 08/05/2010, 07/14/2015, 07/07/2020, 06/18/2025 |

**Table 09-16.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Lil Water | - | 1988 | 600 |
| Seeding - Aerial | South Slope Vegetation Restoration Phase 2 | 4856 | October 2019 | 667 |

**Table 09-16.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| South Slope Broadcast | | | Aerial | Oct 2019 | 824 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | Ephraim | 2.00 | 1.78 |
| G | Elymus lanceolatus | Thickspike Wheatgrass | Critana | 0.49 | 0.45 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Discovery | 1.03 | 0.66 |
| G | Poa secunda | Big Bluegrass | Sherman | 2.49 | 2.26 |
| G | Pseudoroegneria spicata | Bluebunch Wheatgrass | Anatone | 0.49 | 0.45 |
| F | Medicago sativa | Alfalfa | Ladak DL | 0.24 | 0.21 |
| F | Medicago sativa | Yellow Alfalfa | Don | 0.12 | 0.12 |
| F | Sanguisorba minor | Small Burnet | Delar | 0.49 | 0.43 |
| S | Artemisia tridentata ssp. vaseyana | Mountain Big Sagebrush | Beaver UT | 0.24 | 0.07 |
| S | Artemisia tridentata ssp. vaseyana | Mountain Big Sagebrush | Duchesne UT | 1.21 | 0.31 |

## Wildlife Habitat and Vegetation History

**Table 09-16.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Deer | crucial | winter |
| Greater Sage Grouse | | undefined |
| Elk | crucial | winter |

**Table 09-16.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mixed Mountain Brush | Early Phase I |
| 1988 | Mixed Mountain Brush | Early Phase I |
| 1995 | Perennial Grass | No Encroachment |
| 2000 | Perennial Grass/Mixed Mountain Brush | No Encroachment |
| 2005 | Mixed Mountain Brush/Perennial Grass | No Encroachment |
| 2010 | Mixed Mountain Brush/Perennial Grass | No Encroachment |
| 2015 | Mixed Mountain Brush/Perennial Grass | No Encroachment |
| 2020 | Mixed Mountain Brush/Perennial Grass | No Encroachment |
| 2025 | Mixed Mountain Brush/Perennial Grass | No Encroachment |

## Site Notes

Lyman Springs is about a quarter mile to the west of the site. Soon after the reading of this study in August 1988, the area was burned by a wildfire. During the 1995 reading, it was noted that belts 1 and 5 from the original baseline were not burned while belts 2, 3, and 4 were burned. As a result, most of the shrubs on the burned belts were eliminated.

## Soils

**Table 09-16.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 6.3 | 50.9 | 28.8 | 20.3 | 4.6 | 27.8 | 316.8 | 1.4 | 07/18/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 20 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1982, the plant community on this site existed as a mixed mountain brush vegetation type with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and Utah serviceberry (*Amelanchier utahensis*) as the dominant species (Photos, Pre-1992 Data); most of the study site burned in 1988 (Table 09-16.1). The site transitioned to a perennial grass plant community (Table 09-16.7) following the fire, but has since transitioned back to a mixed mountain brush community type (Table 09--16.12, Table 09-16.13). The herbaceous understory has remained diverse and abundant over the sample years, with perennial grassesas

a co-dominant site component with mountain brush since 2000. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been sampled in the understory, but abundance has remained low (Table 09-16.10, Table 09-16.11). This site will likely remain as a mixed mountain brush plant community unless a major disturbance occurs that removes the shrub component.

Deer winter range condition has improved from fair to excellent since 1995. Condition enhancement can be attributed to an increase in preferred browse cover. In 2025, deer winter range condition was considered to be excellent. Attention should be given to the gradual invasion of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-16.6, Table 09-16.7, Table 09-16.15). Pellet transect data shows that deer and elk presence has been relatively consistent over the sample period at moderate levels (Table 09-16.9). During the 2024/25 winter season the area had concentrated occurrences of collared mule deer (Wildlife Migration Initiative). Utilization of Utah serviceberry has remained high, with over 60% of plants sampled in density strips being moderately to heavily hedged since 1995. Mountain big sagebrush (which has had consistently higher densities than Utah serviceberry), however, has had lighter utilization; over 50% of sagebrush plants sampled in density strips have exhibited signs of little to no browsing since 2010 (Table 09-16.13). On-site observations in 2025 noted the presence of a buck deer and a coyote.

## Trend Summary Tables

**Table 09-16.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 5.3 | 2.1 | - | - | - | - |
| 2000 | 8.4 | 2.3 | - | - | - | - |
| 2005 | 9.2 | 4.0 | - | 15.6 | 5.2 | - |
| 2010 | 15.9 | 1.3 | - | 26.7 | 4.6 | - |
| 2015 | 21.7 | 1.2 | - | 35.0 | 4.5 | - |
| 2020 | 23.3 | 2.8 | - | 34.6 | 2.4 | - |
| 2025 | 23.2 | 2.9 | - | 36.4 | 2.7 | - |

**Table 09-16.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 130 | 416 | 279 | 255 | 1.3 | 15.3 | 2.0 | 5.1 |
| 2000 | - | 440 | 22 | 246 | - | 22.7 | 0.1 | 11.7 |
| 2005 | 81 | 402 | 289 | 269 | 2.1 | 15.0 | 2.7 | 11.9 |
| 2010 | 96 | 392 | 181 | 252 | 2.6 | 18.9 | 1.1 | 11.4 |
| 2015 | 214 | 393 | 267 | 249 | 6.6 | 16.0 | 9.4 | 6.9 |
| 2020 | 77 | 388 | 364 | 246 | 1.1 | 17.4 | 7.4 | 12.1 |
| 2025 | 23 | 376 | 151 | 252 | 0.4 | 17.8 | 0.9 | 9.8 |

**Table 09-16.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 14.6 | 0.0 | 49.1 | 0.2 | 6.8 | 39.5 |
| 2000 | 20.7 | 0.5 | 50.1 | 0.6 | 7.5 | 49.1 |
| 2005 | 29.8 | 0.1 | 25.6 | 0.3 | 5.5 | 47.2 |
| 2010 | 18.6 | 0.0 | 41.0 | 2.3 | 7.2 | 49.8 |
| 2015 | 20.1 | 0.1 | 33.7 | 1.1 | 6.0 | 54.9 |
| 2020 | 14.1 | 0.4 | 42.4 | 4.7 | 7.5 | 49.1 |
| 2025 | 27.6 | 0.2 | 41.1 | 0.9 | 7.4 | 46.1 |

**Table 09-16.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1995 | - | 24 | 16 | 21 | 1 | - | 3 |
| 2000 | - | 7 | 11 | 13 | - | 1 | - |
| 2005 | - | 21 | 15 | 17 | - | - | 17 |
| 2010 | - | 8 | 16 | 6 | - | - | 5 |
| 2015 | - | 3 | 37 | 19 | - | - | 7 |
| 2020 | - | 5 | 46 | 16 | - | - | 9 |
| 2025 | - | 4 | 36 | 6 | - | - | 13 |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | 0.7 (1.7) | 35.6 (87.9) | 8.7 (21.5) | 20.1 (49.7) | - | - | - |
| 2005 | - | 59.5 (147.0) | 13.4 (33.1) | 13.4 (33.1) | - | - | - |
| 2010 | - | 34.9 (86.1) | 14.1 (34.8) | 23.4 (57.9) | - | - | - |
| 2015 | - | 0.7 (1.8) | 38.2 (94.4) | 8.7 (21.5) | - | - | - |
| 2020 | - | 24.7 (61.0) | 30.8 (76.1) | 14.1 (34.8) | - | - | - |
| 2025 | - | 1.5 (3.6) | 24.8 (61.2) | 5.3 (13.2) | - | - | - |

**Table 09-16.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Bromus tectorum[ai] (cheatgrass) | Carex douglasii (Douglas' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Melica bulbosa (oniongrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 60 | 130 | - | 21 | 312 | 66 | - | 163 | 120 | 38 |
| 2000 | 8 | - | - | 65 | 251 | 80 | - | 234 | 47 | 33 |
| 2005 | 13 | 81 | - | 18 | 255 | 122 | - | 200 | 25 | 57 |
| 2010 | 35 | 96 | 9 | 19 | 170 | 127 | 1 | 228 | 29 | 105 |
| 2015 | 19 | 214 | 42 | 18 | 108 | 58 | 2 | 255 | 20 | 200 |
| 2020 | 18 | 77 | 54 | 26 | 139 | 195 | - | 124 | 23 | 154 |
| 2025 | 15 | 23 | 3 | 14 | 169 | 161 | - | 112 | 23 | 152 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.8 | 1.3 | - | 0.1 | 8.4 | 1.8 | - | 2.9 | 1.1 | 0.3 |
| 2000 | 0.3 | - | - | 1.9 | 11.1 | 2.8 | - | 4.8 | 1.3 | 0.6 |
| 2005 | 0.1 | 2.1 | - | 0.1 | 4.0 | 4.9 | - | 4.4 | 0.3 | 1.1 |
| 2010 | 0.5 | 2.6 | 0.4 | 0.1 | 1.6 | 5.3 | 0.0 | 6.5 | 1.0 | 3.5 |
| 2015 | 0.1 | 6.6 | 0.5 | 0.1 | 0.6 | 1.8 | 0.0 | 9.5 | 0.4 | 3.1 |
| 2020 | 0.2 | 1.1 | 0.3 | 0.8 | 2.9 | 5.3 | - | 3.7 | 0.3 | 3.9 |
| 2025 | 1.1 | 0.4 | 0.0 | 0.2 | 3.1 | 5.7 | - | 3.4 | 1.6 | 2.7 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-16.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Artemisia ludoviciana (white sagebrush) | Astragalus (milkvetch) | Astragalus purshii (woollypod milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Camelina microcarpa[ai] (littlepod false flax) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 3 | 62 | - | 35 | 12 | - | 2 | 7 | 107 | - | - | 7 | - | 64 | 79 | - | 20 |
| 2000 | - | - | - | 65 | - | 0 | 3 | - | 64 | - | - | - | - | 10 | - | 3 | - |
| 2005 | 10 | 77 | - | 18 | 16 | 1 | 1 | 10 | 86 | - | - | 23 | 1 | 119 | 170 | 12 | - |
| 2010 | 11 | 18 | - | 28 | - | 7 | 5 | 1 | 119 | - | 5 | - | - | 98 | 27 | 20 | 1 |
| 2015 | - | - | - | 22 | 21 | 10 | 0 | 1 | 127 | 3 | - | 5 | - | 2 | 1 | 5 | - |
| 2020 | 3 | 31 | - | 15 | 10 | 5 | - | 3 | 112 | 51 | - | - | - | 265 | 88 | - | - |
| 2025 | 2 | 17 | 3 | 9 | 7 | 4 | - | 6 | 119 | 30 | 4 | - | - | 82 | 22 | 5 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.2 | - | 0.9 | 0.0 | - | 0.0 | 0.1 | 1.2 | - | - | 0.0 | - | 0.3 | 0.2 | - | 0.1 |
| 2000 | - | - | - | 3.1 | - | 0.0 | 0.0 | - | 2.3 | - | - | - | - | 0.0 | - | 0.2 | - |
| 2005 | 0.1 | 0.2 | - | 0.2 | 0.1 | 0.0 | 0.0 | 0.1 | 2.7 | - | - | 0.1 | 0.0 | 0.7 | 0.5 | 0.1 | - |
| 2010 | 0.1 | 0.1 | - | 0.7 | - | 0.1 | 0.0 | 0.0 | 5.5 | - | 0.0 | - | - | 0.3 | 0.1 | 0.1 | 0.0 |
| 2015 | - | - | - | 0.6 | 0.1 | 0.1 | 0.0 | 0.0 | 2.9 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - |
| 2020 | 0.0 | 0.1 | - | 0.1 | 0.0 | 0.1 | - | 0.0 | 5.2 | 0.5 | - | - | - | 2.1 | 0.3 | - | - |
| 2025 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.1 | - | 0.1 | 4.8 | 0.2 | 0.0 | - | - | 0.2 | 0.1 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron divergens[a] (spreading fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Helianthella uniflora (oneflower helianthella) | Heterotheca villosa (hairy false goldenaster) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Lithospermum ruderale (western stoneseed) | Lupinus argenteus (silvery lupine) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 1 | 3 | 28 | - | - | 34 | 3 | 8 | - | 1 | - | 13 | 5 | 1 | 93 | 15 | 3 |
| 2000 | - | 4 | 2 | - | - | 99 | 12 | 7 | - | - | - | 12 | - | - | - | 7 | 23 |
| 2005 | 1 | 25 | 19 | 8 | 3 | 74 | - | 19 | 6 | 11 | - | 8 | - | 10 | 4 | 4 | 29 |
| 2010 | 1 | 24 | - | 11 | 34 | 19 | 2 | 16 | - | - | - | 29 | - | - | 4 | 5 | 16 |
| 2015 | - | 30 | 118 | 12 | 177 | 42 | 7 | 0 | 1 | 3 | - | 23 | 1 | 36 | 47 | 6 | 1 |
| 2020 | 4 | 26 | 4 | - | 137 | 35 | - | - | 17 | - | - | 17 | - | 23 | - | 0 | 1 |
| 2025 | - | 51 | - | - | 9 | 15 | - | 7 | 2 | 1 | 7 | 18 | - | 4 | - | 3 | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.1 | - | - | 0.1 | 0.0 | 0.6 | - | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.2 | 0.4 | 0.1 |
| 2000 | - | 0.0 | 0.0 | - | - | 2.9 | 0.2 | 0.3 | - | - | - | 0.2 | - | - | - | 0.1 | 0.4 |
| 2005 | 0.0 | 0.1 | 0.4 | 0.1 | 0.1 | 1.4 | - | 1.1 | 0.0 | 0.0 | - | 0.5 | - | 0.0 | 0.0 | 0.2 | 2.4 |
| 2010 | 0.0 | 0.1 | - | 0.0 | 0.3 | 0.1 | 0.0 | 0.7 | - | - | - | 0.9 | - | - | 0.0 | 0.3 | 0.3 |
| 2015 | - | 0.1 | 0.5 | 0.1 | 8.3 | 0.3 | 0.2 | 0.0 | 0.0 | 0.1 | - | 0.6 | 0.0 | 0.2 | 0.2 | 0.1 | 0.0 |
| 2020 | 0.0 | 0.2 | 0.0 | - | 3.5 | 1.1 | - | - | 0.3 | - | - | 0.8 | - | 0.0 | - | 0.0 | 0.0 |
| 2025 | - | 0.2 | - | - | 0.2 | 0.3 | - | 0.2 | 0.0 | 0.0 | 0.0 | 0.8 | - | 0.0 | - | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Microsteris gracilis[a] (slender phlox) | Orobanche fasciculata (clustered broomrape) | Orogenia linearifolia (Great Basin Indian potato) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Thermopsis montana (mountain goldenbanner) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 4 | - | - | - | 8 | - | 17 | - | 194 | 1 | 1 | - | 20 | 70 | 30 | - | 7 |
| 2000 | - | - | - | 1 | 9 | - | 2 | - | 5 | 2 | - | - | 3 | 85 | 6 | - | 5 |
| 2005 | 69 | 2 | - | - | 13 | - | 13 | - | 143 | 2 | - | - | 7 | 98 | 19 | 3 | 18 |
| 2010 | 9 | - | - | 1 | 9 | - | 6 | 1 | 87 | 2 | - | - | 12 | 88 | 6 | - | 1 |
| 2015 | - | 1 | - | - | 6 | 8 | 11 | - | 4 | 2 | - | - | 19 | 96 | 2 | 6 | - |
| 2020 | 21 | - | 3 | 6 | - | 4 | 23 | - | 225 | 2 | - | 4 | 17 | 81 | - | - | 13 |
| 2025 | 52 | - | - | - | 1 | 3 | 29 | 3 | 46 | 2 | - | 2 | 19 | 93 | - | 1 | 1 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | - | - | 0.0 | - | 0.0 | - | 1.1 | 0.0 | 0.0 | - | 0.1 | 1.0 | 0.2 | - | 0.0 |
| 2000 | - | - | - | 0.0 | 0.1 | - | 0.0 | - | 0.0 | 0.1 | - | - | 0.1 | 1.7 | 0.1 | - | 0.0 |
| 2005 | 0.4 | 0.0 | - | - | 0.1 | - | 0.0 | - | 0.3 | 0.0 | - | - | 0.0 | 2.2 | 0.2 | 0.1 | 0.2 |
| 2010 | 0.0 | - | - | 0.1 | 0.1 | - | 0.0 | 0.0 | 0.3 | 0.0 | - | - | 0.2 | 2.0 | 0.0 | - | 0.0 |
| 2015 | - | 0.0 | - | - | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | - | - | 0.1 | 1.5 | 0.0 | 0.1 | - |
| 2020 | 0.1 | - | 0.0 | 0.0 | - | 0.0 | 0.1 | - | 1.3 | 0.1 | - | 0.0 | 0.3 | 3.1 | - | - | 0.1 |
| 2025 | 0.3 | - | - | - | 0.0 | 0.1 | 0.3 | 0.0 | 0.1 | 0.1 | - | 0.0 | 0.2 | 1.6 | - | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Zigadenus paniculatus (foothill deathcamas) |
|---|---|
| year | Nested |
| 1995 | - |
| 2000 | - |
| 2005 | 9 |
| 2010 | 5 |
| 2015 | 6 |
| 2020 | 4 |
| 2025 | 14 |
| year | Average Cover (%) |
| 1995 | - |
| 2000 | - |
| 2005 | 0.1 |
| 2010 | 0.0 |
| 2015 | 0.0 |
| 2020 | 0.0 |
| 2025 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-16.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Ceanothus fendleri (Fendler's ceanothus) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Eriogonum heracleoides (parsnipflower buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Opuntia fragilis (brittle pricklypear) | Purshia tridentata[p] (antelope bitterbrush) | Sambucus nigra ssp. cerulea[p] (blue elderberry) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 5.6 | 7.4 | 4.7 | 0 | 0.5 | - | - | 2.6 | - | 0 |
| 2010 | 9 | 15.9 | 3.1 | 0.2 | 1.2 | 0 | 0.1 | 1.5 | - | 0.3 |
| 2015 | 8.6 | 23.2 | 4 | - | 0.2 | 0.1 | 0.2 | 3.2 | - | - |
| 2020 | 9.3 | 20.4 | 1.9 | 0.1 | - | 0.4 | - | 4.9 | - | - |
| 2025 | 11.6 | 20.4 | 2.2 | - | - | 0.5 | - | 3.8 | - | 0.6 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | 1.8 | 3.4 | 1.9 | 0.2 | - | - | - | 0.0 | - | 0.1 |
| 2000 | 2.7 | 4.5 | 2.1 | 0.0 | - | 0.2 | 0.0 | 1.0 | - | 0.1 |
| 2005 | 2.7 | 5.4 | 3.4 | 0.0 | 0.0 | 0.6 | - | 0.9 | - | 0.2 |
| 2010 | 4.3 | 9.3 | 1.0 | 0.2 | 0.0 | 0.1 | 0.1 | 2.0 | - | 0.3 |
| 2015 | 5.2 | 15.0 | 0.9 | - | 0.0 | 0.0 | 0.2 | 1.5 | - | 0.0 |
| 2020 | 6.6 | 13.5 | 1.7 | 0.0 | - | 1.1 | 0.1 | 3.0 | 0.1 | 0.0 |
| 2025 | 7.4 | 13.3 | 1.5 | - | - | 1.1 | 0.4 | 2.4 | - | 0.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-16.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 460 | 40 | 4 | 91 | 4 | 39 | 39 | 0 | 63/91 |
| 2000 | 400 | - | 20 | 80 | 0 | 50 | 25 | 0 | 83/115 |
| 2005 | 380 | - | 5 | 90 | 5 | 11 | 84 | 0 | 84/121 |
| 2010 | 460 | 180 | 9 | 91 | 0 | 35 | 48 | 4 | 105/138 |
| 2015 | 500 | 60 | 16 | 76 | 8 | 60 | 28 | 8 | 99/134 |
| 2020 | 560 | - | 29 | 68 | 4 | 21 | 43 | 4 | 111/145 |
| 2025 | 360 | - | 11 | 83 | 6 | 17 | 67 | 6 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1600 | 60 | 8 | 85 | 8 | 61 | 20 | 0 | 40/52 |
| 2000 | 1900 | - | 12 | 75 | 14 | 28 | 0 | 4 | 38/62 |
| 2005 | 1540 | 2820 | 16 | 66 | 18 | 46 | 7 | 14 | 47/88 |
| 2010 | 6220 | 2760 | 34 | 65 | 1 | 9 | 0 | 1 | 39/65 |
| 2015 | 5660 | 20 | 23 | 71 | 6 | 33 | 14 | 9 | 38/65 |
| 2020 | 3660 | 160 | 22 | 56 | 21 | 10 | 12 | 22 | 44/82 |
| 2025 | 6760 | 920 | 56 | 41 | 3 | 9 | 3 | 3 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ceanothus fendleri -- (Fendler's ceanothus) | | | | | | | | | |
| 1995 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/136 |
| 2000 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/169 |
| 2005 | 420 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/130 |
| 2010 | 600 | - | 7 | 0 | 93 | 0 | 0 | 95 | 14/27 |
| 2015 | 1040 | - | 0 | 100 | 0 | 0 | 17 | 0 | 23/37 |
| 2020 | 940 | - | 2 | 98 | 0 | 81 | 0 | 0 | 18/58 |
| 2025 | 1520 | - | 0 | 97 | 3 | 37 | 13 | 3 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 25 | 0 | 25/41 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/27 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/52 |
| 2010 | 100 | - | 0 | 80 | 20 | 0 | 0 | 20 | 29/54 |
| 2015 | 40 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 25/44 |
| 2020 | - | - | - | - | - | - | - | - | 39/86 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 32/51 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/46 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | 540 | - | 33 | 67 | 0 | 0 | 0 | 0 | 13/40 |
| 2000 | 220 | - | 36 | 64 | 0 | 0 | 0 | 0 | 10/28 |
| 2005 | 460 | - | 4 | 96 | 0 | 17 | 0 | 0 | 24/35 |
| 2010 | 660 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/33 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. glabrata -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 33/28 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 38/45 |
| 2005 | - | - | - | - | - | - | - | - | 41/39 |
| 2010 | - | - | - | - | - | - | - | - | 43/59 |
| 2015 | - | - | - | - | - | - | - | - | 40/30 |
| 2020 | - | - | - | - | - | - | - | - | 43/59 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/26 |
| 2000 | 320 | 20 | 6 | 94 | 0 | 0 | 0 | 0 | 17/21 |
| 2005 | 560 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/26 |
| 2010 | 540 | - | 7 | 93 | 0 | 0 | 0 | 0 | 21/27 |
| 2015 | 80 | 40 | 25 | 75 | 0 | 0 | 0 | 0 | 17/21 |
| 2020 | 1160 | - | 2 | 98 | 0 | 0 | 0 | 0 | 18/22 |
| 2025 | 960 | - | 10 | 90 | 0 | 0 | 0 | 0 | - / - |

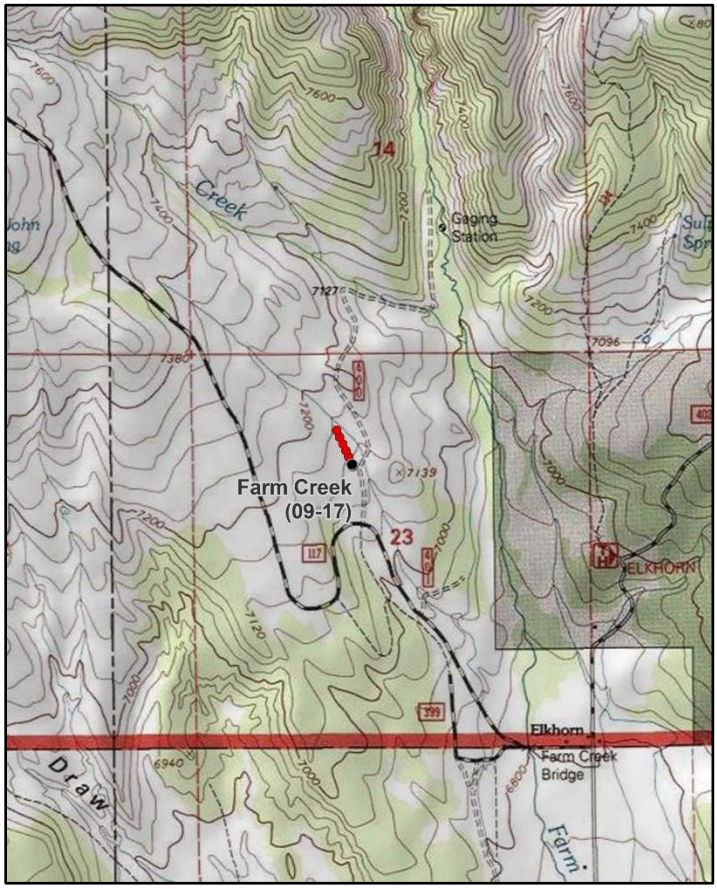
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 140 | - | 0 | 100 | 0 | 0 | 0 | 29 | 7/36 |
| 2000 | 200 | - | 20 | 20 | 60 | 0 | 0 | 10 | 7/24 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/33 |
| 2010 | 140 | - | 57 | 43 | 0 | 0 | 14 | 0 | 6/31 |
| 2015 | 160 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 8/19 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 20 | 6/18 |
| 2025 | 240 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 8/17 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Prunus virginiana[p] -- (chokecherry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 113/86 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 240 | - | 25 | 75 | 0 | 50 | 17 | 0 | 25/71 |
| 2000 | 300 | - | 0 | 100 | 0 | 60 | 27 | 0 | 31/104 |
| 2005 | 300 | - | 0 | 100 | 0 | 0 | 100 | 0 | 34/116 |
| 2010 | 380 | - | 11 | 90 | 0 | 26 | 47 | 0 | 48/128 |
| 2015 | 500 | - | 4 | 96 | 0 | 48 | 24 | 4 | 33/107 |
| 2020 | 600 | - | 3 | 97 | 0 | 23 | 70 | 3 | 39/125 |
| 2025 | 560 | - | 0 | 96 | 4 | 7 | 93 | 4 | - / - |
| Sambucus nigra ssp. cerulea[p] -- (blue elderberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 119/175 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 200 | - | 40 | 60 | 0 | 10 | 30 | 0 | 31/50 |
| 2000 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 37/63 |
| 2005 | 140 | 20 | 29 | 57 | 14 | 0 | 14 | 14 | 39/87 |
| 2010 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 35/85 |
| 2015 | 180 | - | 33 | 67 | 0 | 11 | 0 | 0 | 30/48 |
| 2020 | 120 | 20 | 33 | 67 | 0 | 0 | 50 | 0 | 36/93 |
| 2025 | 200 | 40 | 40 | 60 | 0 | 10 | 40 | 0 | - / - |

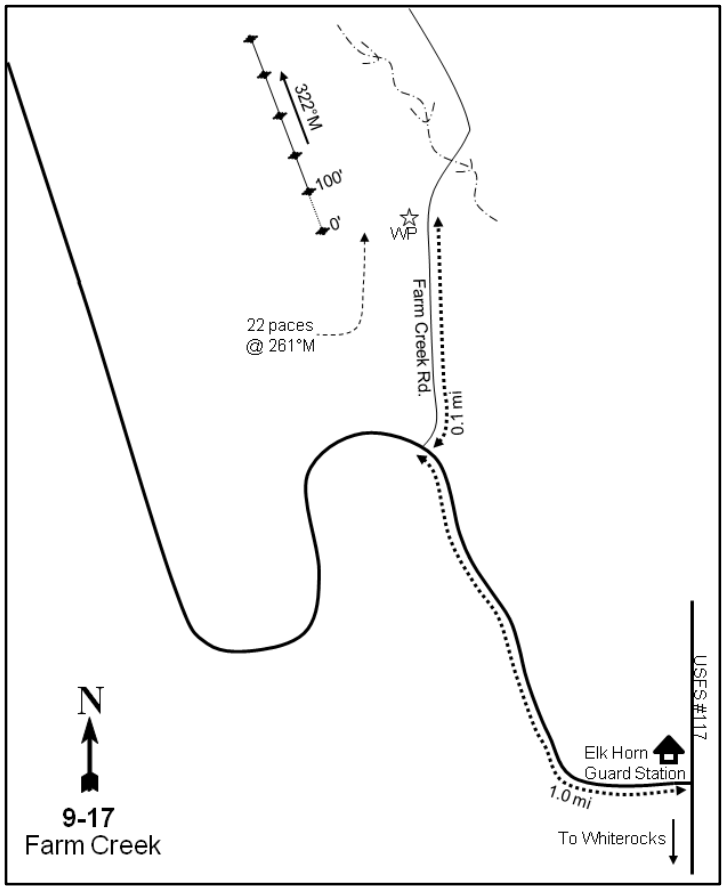
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-16.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 7.0 | 13.1 | 3.4 | 30.0 | -1.0 | 10.0 | 0.0 | **62.5** | Fair |
| 2000 | 11.4 | 12.8 | 6.4 | 30.0 | 0.0 | 10.0 | 0.0 | **70.6** | Fair-Good |
| 2005 | 21.6 | 11.8 | 4.7 | 29.9 | -1.6 | 10.0 | 0.0 | **76.4** | Good |
| 2010 | 30.0 | 14.9 | 11.9 | 30.0 | -1.9 | 10.0 | 0.0 | **94.9** | Excellent |
| 2015 | 30.0 | 13.2 | 9.8 | 30.0 | -4.9 | 10.0 | 0.0 | **88.1** | Good-Excellent |
| 2020 | 30.0 | 10.9 | 10.7 | 30.0 | -0.8 | 10.0 | 0.0 | **90.8** | Good-Excellent |
| 2025 | 30.0 | 13.9 | 15.0 | 30.0 | -0.3 | 10.0 | 0.0 | **98.6** | Excellent |

# FARM CREEK - STUDY NO. 09-17




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Ice Cave Peak SW; Township 2N, Range 1W, Section 23 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 587538 East 4490307 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 322° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From Whiterocks, drive east on 11500 North (Tridell Highway) to the junction of 5500 East (Whiterocks Loop Road). Turn left (north) and drive 7.9 miles to the Elkhorn Guard Station located north of Whiterocks; the main road will bend west. Continue on this Forest Service road (Farm Creek Road) for 1 mile. At the first switchback turn right (north) and travel 0.1 miles to the witness post located on the left (west) side of the road. From the witness post walk 22 paces at 261 degrees magnetic to the 0-foot baseline stake.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | FARM CREEK/BUCK RIDGE |
| Elevation | 7,100ft (2,164m) |
| Aspect | Southeast |
| Slope | 5-7% |
| Sample Dates | 08/25/1995, 07/20/2000, 07/12/2005, 08/02/2010, 07/09/2015, 07/08/2020, 06/18/2025 |

**Table 09-17.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Neola North | - | Summer 2007 | 43806 |

## Wildlife Habitat and Vegetation History

**Table 09-17.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | year-long |

**Table 09-17.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Perennial Grass | No Encroachment |
| 2015 | Perennial Grass | No Encroachment |
| 2020 | Perennial Grass | No Encroachment |
| 2025 | Perennial Grass | No Encroachment |

## Site Notes

In the summer of 2007, the Neola North wildfire burned 43,806 acres in the area (including the site) and effectively removed the browse component. Some of the surrounding area was seeded in a rehabilitation effort following the fire, but the study site was not included in the seeding.

## Soils

**Table 09-17.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.8 | 58.9 | 22.8 | 18.3 | 3.7 | 19.2 | 211.2 | 1.0 | 07/20/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Mountain Stony Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC462UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1995, the plant community on this site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) (Table 09-17.12) with a herbaceous understory largely composed of crested wheatgrass (*Agropyron cristatum*). Following a fire in 2007 (Table 09-17.1), the site transitioned to a perennial grass community with crested wheatgrass as the dominant species. The introduced perennial grass species bulbous bluegrass (*Poa bulbosa*) has been present in the understory, and cover and abundance have remained moderate since 2020 (Table 09-17.7, Table 09-17.10). Shrubs have started to reestablish in the area, but are a minor site component as of the 2025 sample year (Table 09-17.12).

Overall deer winter range condition has deteriorated from good to fair since 1995. Condition degradation can be attributed to the removal of preferred browse cover following the Neola North fire in 2007; however, recruitment and cover of preferred browse cover has been increasing. In 2025, deer winter range condition was considered to be fair. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance. Improvement to deer wintering range can been achieved through efforts that increase preferred browse recruitment and cover (Table 09-17.6, Table 09-17.7, Table 09-17.13, Table 09-17.15). Pellet transect data shows that deer presence has been relatively consistent over the sample period at low to moderate levels (Table 09-17.9). During the 2024/25 winter season the area had nearby occurrences of collared mule deer (Wildlife Migration Initiative). The preferred browse component was heavily utilized in 2025, with 100% of preferred browse plants sampled in density strips being moderately to heavily browsed. This higher utilization can in part be attributed to the limited size of the preferred browse population (Table 09-17.13) and, as such, utilization being concentrated on fewer plants.

## Trend Summary Tables

**Table 09-17.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 19.6 | 0.4 | 0.0 | - | - | - |
| 2000 | 26.3 | 1.0 | - | - | - | - |
| 2005 | 23.0 | 0.2 | - | 28.7 | 0.4 | - |
| 2010 | 1.2 | 0.7 | - | 0.9 | 3.1 | - |
| 2015 | 1.6 | 1.6 | - | 3.1 | 1.4 | - |
| 2020 | 3.9 | 3.2 | - | 5.0 | 1.9 | - |
| 2025 | 4.5 | 2.2 | - | 5.3 | 0.9 | - |

**Table 09-17.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 17 | 406 | 156 | 122 | 0.1 | 20.5 | 0.6 | 1.3 |
| 2000 | - | 408 | 5 | 64 | - | 27.6 | 0.0 | 1.5 |
| 2005 | 43 | 402 | 86 | 113 | 0.8 | 23.2 | 0.4 | 1.6 |
| 2010 | 67 | 336 | 135 | 186 | 0.9 | 17.3 | 1.4 | 7.3 |
| 2015 | 100 | 403 | 218 | 259 | 1.1 | 29.8 | 4.2 | 13.7 |
| 2020 | 8 | 408 | 162 | 176 | 0.0 | 28.9 | 5.2 | 4.8 |
| 2025 | - | 425 | 3 | 167 | - | 40.1 | 0.0 | 3.9 |

**Table 09-17.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 7.2 | 0.4 | 55.9 | 0.5 | 10.7 | 44.8 |
| 2000 | 11.9 | 1.2 | 58.5 | 0.9 | 10.6 | 52.5 |
| 2005 | 16.0 | 0.2 | 38.5 | 0.3 | 10.0 | 48.3 |
| 2010 | 15.7 | 0.0 | 50.3 | 0.9 | 13.5 | 31.1 |
| 2015 | 14.2 | 0.2 | 48.7 | 1.4 | 14.3 | 45.4 |
| 2020 | 14.3 | 0.2 | 50.8 | 0.7 | 18.7 | 45.2 |
| 2025 | 17.1 | 0.1 | 26.2 | 0.8 | 16.6 | 51.1 |

**Table 09-17.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | 22 | 9 | 4 | - | 10 |
| 2000 | - | 11 | 2 | 2 | - | 16 |
| 2005 | - | 16 | 7 | 2 | - | 10 |
| 2010 | - | - | 5 | 2 | - | 2 |
| 2015 | - | 10 | 13 | - | - | 5 |
| 2020 | - | 14 | 23 | - | 1 | 1 |
| 2025 | - | 13 | 33 | 6 | - | 3 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 2.7 (6.6) | 14.5 (35.9) | 24.1 (59.6) | 8.1 (19.9) | - | - |
| 2005 | - | 37.7 (93.2) | 16.8 (41.4) | 1.3 (3.3) | - | - |
| 2010 | - | - | 14.1 (34.8) | - | - | - |
| 2015 | - | - | 12.1 (29.8) | - | - | - |
| 2020 | - | 23.2 (57.4) | 22.1 (54.6) | 0.7 (1.7) | - | - |
| 2025 | - | 45.7 (113.0) | 36.2 (89.4) | 6.0 (14.9) | - | - |

**Table 09-17.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1995 | 387 | - | 17 | 3 | - | 85 | 5 | 5 | 2 |
| 2000 | 405 | - | - | 8 | - | 51 | 8 | - | - |
| 2005 | 367 | - | 43 | 13 | 2 | 137 | 7 | - | 6 |
| 2010 | 319 | - | 67 | 18 | - | 49 | 4 | - | 6 |
| 2015 | 389 | 3 | 100 | 41 | - | 81 | - | - | 3 |
| 2020 | 364 | - | 8 | 50 | - | 241 | - | - | 12 |
| 2025 | 393 | 4 | - | 15 | - | 215 | - | - | 13 |
| year | Average Cover (%) | | | | | | | | |
| 1995 | 17.8 | - | 0.1 | 0.0 | - | 2.7 | 0.1 | 0.0 | 0.0 |
| 2000 | 26.7 | - | - | 0.1 | - | 0.9 | 0.0 | - | - |
| 2005 | 17.8 | - | 0.8 | 0.1 | 0.0 | 5.1 | 0.1 | - | 0.0 |
| 2010 | 16.2 | - | 0.9 | 0.1 | - | 0.7 | 0.1 | - | 0.0 |
| 2015 | 25.9 | 0.0 | 1.1 | 1.2 | - | 2.6 | - | - | 0.0 |
| 2020 | 21.8 | - | 0.0 | 0.3 | - | 6.5 | - | - | 0.3 |
| 2025 | 32.9 | 0.0 | - | 0.1 | - | 6.6 | - | - | 0.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-17.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Antennaria (pussytoes) | Arabis (rockcress) | Artemisia ludoviciana (white sagebrush) | Astragalus convallarius (lesser rushy milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Conyza canadensis[a] (Canadian horseweed) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 20 | - | 14 | 27 | 7 | 4 | - | - | 1 | - | - | 48 | 6 | 5 | - | - |
| 2000 | - | - | 4 | 3 | 7 | 2 | 3 | - | - | - | - | 4 | - | - | - | - | - |
| 2005 | 3 | 25 | 1 | 11 | 20 | 6 | 5 | - | 2 | 0 | - | - | 5 | - | - | 1 | 2 |
| 2010 | 3 | 15 | 2 | 1 | 33 | 8 | - | - | - | - | 1 | - | - | - | 6 | - | 23 |
| 2015 | 1 | - | 4 | 3 | 61 | 6 | 4 | - | - | - | - | - | - | - | - | - | 2 |
| 2020 | - | - | 3 | 20 | 19 | - | 3 | - | - | - | - | - | - | - | - | - | - |
| 2025 | 1 | - | - | - | 36 | - | 1 | 1 | - | - | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | - | 0.1 | 0.2 | 0.2 | 0.0 | - | - | 0.0 | - | - | 0.2 | 0.0 | 0.0 | - | - |
| 2000 | - | - | 0.4 | 0.0 | 0.2 | 0.0 | 0.1 | - | - | - | - | 0.0 | - | - | - | - | - |
| 2005 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | - | 0.0 | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.0 |
| 2010 | 0.0 | 0.1 | 0.0 | 0.0 | 0.6 | 0.1 | - | - | - | - | 0.0 | - | - | - | 0.0 | - | 0.3 |
| 2015 | 0.0 | - | 0.2 | 0.0 | 1.7 | 0.2 | 0.2 | - | - | - | - | - | - | - | - | - | 0.0 |
| 2020 | - | - | 0.0 | 0.2 | 0.6 | - | 0.2 | - | - | - | - | - | - | - | - | - | - |
| 2025 | 0.0 | - | - | - | 0.9 | - | 0.0 | 0.0 | - | - | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Draba reptans[a] (Carolina draba) | Erigeron divergens[a] (spreading fleabane) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum racemosum (redroot buckwheat) | Erodium cicutarium[ai] (redstem stork's bill) | Grindelia squarrosa (curlycup gumweed) | Heterotheca villosa (hairy false goldenaster) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Microsteris gracilis[a] (slender phlox) | Oenothera coronopifolia (crownleaf evening primrose) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 64 | - | - | 4 | - | 10 | - | - | 12 | 2 | 9 | 55 | 0 | 3 | - | 1 | - |
| 2000 | 1 | - | 6 | 13 | - | 4 | - | - | 5 | - | - | - | 4 | - | 4 | - | - |
| 2005 | 37 | - | 3 | - | - | 9 | - | - | 5 | - | 5 | 66 | 3 | 2 | 3 | - | - |
| 2010 | - | - | 11 | - | - | 14 | - | 12 | 14 | 29 | 55 | 19 | 13 | 2 | 3 | 5 | - |
| 2015 | 24 | - | - | 5 | 70 | 12 | 0 | - | 39 | 6 | 18 | 195 | 11 | 2 | 3 | - | - |
| 2020 | - | 145 | - | 10 | 1 | 11 | - | - | 35 | - | 3 | - | 4 | - | 6 | - | - |
| 2025 | - | - | - | - | 2 | 6 | - | - | 25 | - | - | - | 0 | - | - | - | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | - | - | 0.0 | - | 0.1 | - | - | 0.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.0 | - |
| 2000 | 0.0 | - | 0.0 | 0.2 | - | 0.1 | - | - | 0.2 | - | - | - | 0.2 | - | 0.0 | - | - |
| 2005 | 0.1 | - | 0.0 | - | - | 0.1 | - | - | 0.0 | - | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | - | - |
| 2010 | - | - | 0.5 | - | - | 0.5 | - | 0.2 | 0.2 | 0.2 | 0.4 | 0.1 | 0.5 | 0.0 | 0.0 | 0.0 | - |
| 2015 | 0.0 | - | - | 0.7 | 3.7 | 0.5 | 0.0 | - | 2.2 | 0.0 | 0.4 | 3.2 | 0.7 | 0.0 | 0.0 | - | - |
| 2020 | - | 5.1 | - | 0.1 | 0.0 | 0.3 | - | - | 0.8 | - | 0.0 | - | 0.1 | - | 0.1 | - | - |
| 2025 | - | - | - | - | 0.0 | 0.2 | - | - | 0.8 | - | - | - | 0.1 | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Orobanche fasciculata (clustered broomrape) | Penstemon (beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 2 | - | - | 14 | 49 | 9 | 21 | 1 | 9 | 1 |
| 2000 | - | - | - | - | - | - | 11 | - | 3 | 2 |
| 2005 | - | 3 | - | 6 | 5 | 7 | 18 | - | 20 | 3 |
| 2010 | - | - | - | - | 35 | 33 | 92 | 14 | 2 | - |
| 2015 | - | 5 | 2 | - | 3 | - | 127 | 14 | 12 | - |
| 2020 | - | - | - | 3 | 14 | - | 108 | 15 | - | - |
| 2025 | 2 | - | - | - | 1 | 0 | 117 | 2 | - | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.0 | - | - | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 |
| 2000 | - | - | - | - | - | - | 0.1 | - | 0.0 | 0.0 |
| 2005 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.3 | - | 0.1 | 0.0 |
| 2010 | - | - | - | - | 0.2 | 0.6 | 3.7 | 0.1 | 0.0 | - |
| 2015 | - | 0.0 | 0.0 | - | 0.0 | - | 3.7 | 0.4 | 0.1 | - |
| 2020 | - | - | - | 0.0 | 0.0 | - | 2.5 | 0.0 | - | - |
| 2025 | 0.0 | - | - | - | 0.0 | 0.0 | 1.7 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-17.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 0.1 | 21.1 | - | 0.3 | 0.1 | - | - | 7.5 |
| 2010 | - | 0.8 | 1.4 | 1.4 | 0.3 | - | - | 0.1 |
| 2015 | 0 | 0.5 | - | 1.4 | 0 | - | - | 2.6 |
| 2020 | 0.2 | 1.1 | 0.4 | 1.5 | 0 | - | - | 3.7 |
| 2025 | 0.3 | 1.8 | - | 0.8 | 0.1 | - | - | 3.2 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | - | 12.9 | - | 0.0 | 0.4 | - | 0.0 | 6.7 |
| 2000 | - | 15.0 | - | 0.9 | 0.2 | - | - | 11.3 |
| 2005 | 0.0 | 14.8 | - | 0.1 | 0.1 | 0.0 | - | 8.2 |
| 2010 | - | 0.0 | 0.0 | 0.6 | 0.0 | - | - | 1.2 |
| 2015 | 0.0 | 0.2 | - | 1.1 | 0.5 | - | - | 1.4 |
| 2020 | 0.0 | 0.9 | 0.6 | 2.0 | 0.5 | - | - | 3.0 |
| 2025 | 0.0 | 1.7 | - | 1.7 | 0.5 | - | - | 2.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-17.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 100 | 100 | 21/55 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 57/69 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 59/91 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 48/72 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 50/65 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 56/85 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2860 | 60 | 8 | 91 | 1 | 23 | 1 | 0 | 62/105 |
| 2000 | 3560 | 60 | 11 | 61 | 29 | 19 | 0 | 1 | 73/99 |
| 2005 | 3100 | 480 | 7 | 64 | 29 | 21 | 0 | 16 | 75/102 |
| 2010 | 120 | - | 33 | 67 | 0 | 50 | 0 | 0 | 25/32 |
| 2015 | 100 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 39/72 |
| 2020 | 100 | 20 | 20 | 80 | 0 | 40 | 0 | 0 | 44/99 |
| 2025 | 200 | - | 0 | 100 | 0 | 30 | 70 | 0 | - / - |

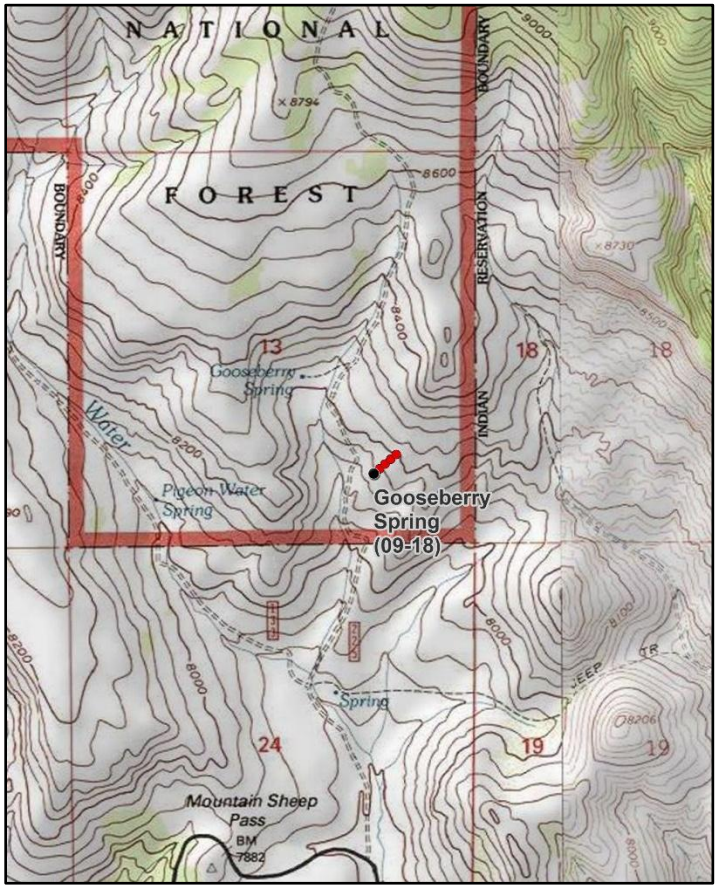
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | 36/60 |
| 2000 | - | - | - | - | - | - | - | - | 37/72 |
| 2005 | - | - | - | - | - | - | - | - | 43/71 |
| 2010 | 180 | 60 | 11 | 89 | 0 | 0 | 0 | 0 | 31/45 |
| 2015 | - | - | - | - | - | - | - | - | 37/61 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 24/51 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Echinocereus -- (hedgehog cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 14/11 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 500 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 24/29 |
| 2000 | 2280 | - | 2 | 97 | 2 | 0 | 0 | 0 | 20/23 |
| 2005 | 940 | - | 2 | 98 | 0 | 0 | 0 | 2 | 24/23 |
| 2010 | 660 | - | 18 | 82 | 0 | 0 | 0 | 0 | 33/49 |
| 2015 | 3480 | 340 | 27 | 73 | 0 | 0 | 0 | 3 | 23/28 |
| 2020 | 4180 | - | 6 | 94 | 0 | 1 | 0 | 0 | 18/21 |
| 2025 | 2620 | - | 0 | 80 | 20 | 15 | 2 | 27 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 1060 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 10/23 |
| 2000 | 680 | - | 9 | 82 | 9 | 0 | 0 | 3 | 6/19 |
| 2005 | 680 | - | 6 | 88 | 6 | 0 | 0 | 3 | 7/19 |
| 2010 | 300 | - | 20 | 80 | 0 | 0 | 0 | 0 | 8/29 |
| 2015 | 560 | 20 | 4 | 93 | 4 | 0 | 0 | 4 | 7/28 |
| 2020 | 440 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/21 |
| 2025 | 580 | - | 10 | 86 | 3 | 0 | 0 | 3 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/8 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/8 |
| 2005 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 6/8 |
| 2010 | - | - | - | - | - | - | - | - | 5/9 |
| 2015 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/9 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/11 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 2100 | - | 16 | 71 | 13 | 43 | 41 | 1 | 33/95 |
| 2000 | 2080 | 40 | 9 | 80 | 12 | 58 | 21 | 2 | 49/113 |
| 2005 | 1980 | - | 6 | 85 | 9 | 11 | 86 | 2 | 44/86 |
| 2010 | 300 | - | 7 | 93 | 0 | 47 | 0 | 0 | 33/78 |
| 2015 | 420 | - | 0 | 100 | 0 | 67 | 29 | 0 | 31/90 |
| 2020 | 220 | - | 0 | 100 | 0 | 9 | 91 | 0 | 28/118 |
| 2025 | 280 | - | 0 | 100 | 0 | 7 | 93 | 0 | - / - |

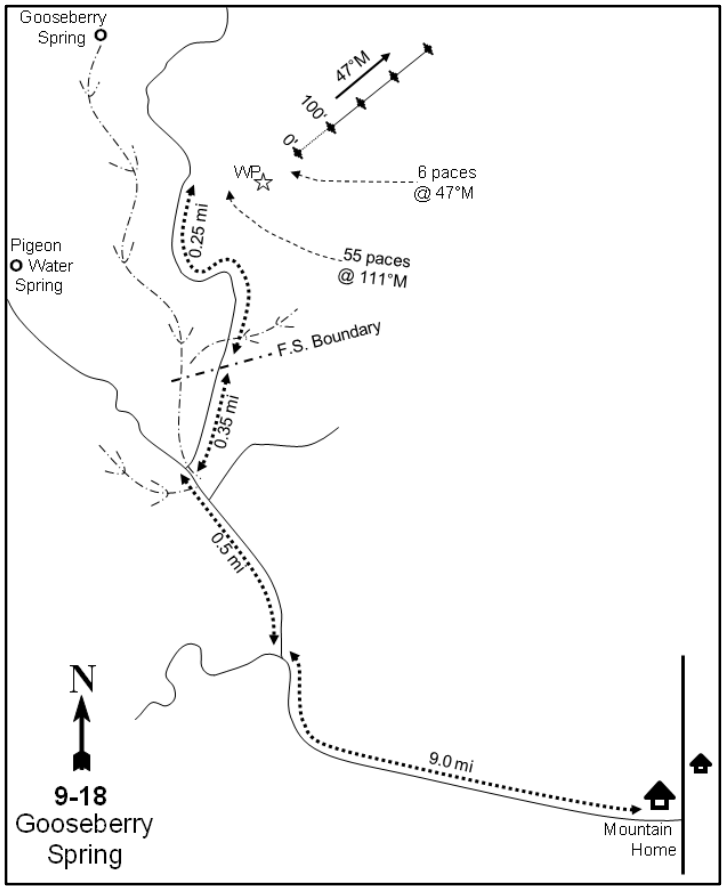
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-17.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 26.2 | 13.5 | 5.5 | 30.0 | 0.0 | 2.6 | 0.0 | **77.8** | Good |
| 2000 | 30.0 | 8.6 | 4.9 | 30.0 | 0.0 | 3.0 | 0.0 | **76.5** | Good |
| 2005 | 30.0 | 7.9 | 3.4 | 30.0 | -0.6 | 3.2 | 0.0 | **73.9** | Good |
| 2010 | 1.2 | 0.0 | 0.0 | 30.0 | -0.7 | 10.0 | 0.0 | **40.5** | Very Poor-Poor |
| 2015 | 4.5 | 0.0 | 0.0 | 30.0 | -0.8 | 10.0 | 0.0 | **43.7** | Poor |
| 2020 | 7.2 | 0.0 | 0.0 | 30.0 | 0.0 | 9.7 | 0.0 | **46.9** | Poor |
| 2025 | 7.5 | 15.0 | 0.0 | 30.0 | 0.0 | 7.7 | 0.0 | **60.2** | Fair |

# GOOSEBERRY SPRING - STUDY NO. 09-18




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Dry Mountain NE; Township 1N, Range 6W, Section 13 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 541570 East 4480881 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7196 |
| Transect Bearing | 47° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (16ft & 92ft), Line 2 (30ft), Line 3 (47ft), Line 4 (66ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from the town of Mountain Home, travel northwest toward Rock Creek. Approximately 9.0 miles from Mountain Home, you will come to a dirt road to the right (north). Before the road, there is a sign that points to Pigeon Water Spring. Take the dirt road to the north for 0.5 miles to a three-way fork. Take the right fork and drive for 0.35 miles to the forest boundary. From the fence, continue 0.25 miles to a bend in the road in a small drainage. From the road, the 0-foot baseline stake is approximately 55 paces up the drainage at 111 degrees magnetic. The 0-foot baseline stake is marked with browse tag #7196.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | PIGEON WATER |
| Elevation | 8,160ft (2,487m) |
| Aspect | Southwest |
| Slope | 12% |
| Sample Dates | 08/03/1995, 07/10/2000, 06/29/2005, 07/20/2010, 07/01/2015, 07/28/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-18.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | year-long |

**Table 09-18.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mixed Mountain Brush | No Encroachment |
| 1988 | Mixed Mountain Brush | No Encroachment |
| 1995 | Mixed Mountain Brush | No Encroachment |
| 2000 | Mixed Mountain Brush | No Encroachment |
| 2005 | Mixed Mountain Brush | No Encroachment |
| 2010 | Mixed Mountain Brush | No Encroachment |
| 2015 | Mixed Mountain Brush/Perennial Grass-Forb | No Encroachment |
| 2025 | Mixed Mountain Brush | No Encroachment |

## Site Notes

The baseline runs up a small draw which contains a large number of Utah serviceberry (*Amelanchier utahensis*), mountain snowberry (*Symphoricarpos oreophilus*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) plants. The side hills are drier and dominated by nearly pure stands of black sagebrush (*Artemisia nova*). Intense animal use from deer, elk, cattle and possibly domestic sheep was reported in 1982.

## Soils

**Table 09-18.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay | 7.0 | 37.9 | 20.8 | 41.3 | 2.2 | 4.8 | 240.0 | 0.8 | 07/10/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1982, the vegetation on this site has remained in a stable state as a mixed mountain brush plant community with mountain snowberry (*Symphoricarpos oreophilus*) and Utah serviceberry (*Amelanchier utahensis*) as the dominant shrub species (Photos, Pre-1992 Data, Table 09-18.12, Table 09-18.13). The herbaceous understory has remained diverse and abundant over the study period with mainly native perennial grasses as the dominant component in most years (Table 09-18.10, Table 09-18.11). It is predicted that the site will remain in this or a similar state without a major disturbance.

The abundant grass and forb communities on this site may provide forage for elk and deer during the summer months (Table 09-18.3, Table 09-18.6, Table 09-18.7). Pellet transect data indicates that elk presence has varied between moderate and high since 2000, and presence of mule deer has been low to moderate over the same period (Table 09-18.9). During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife Migration Initiative). In 2025, at least 50% of most preferred browse plants sampled in density strips displayed signs of moderate to heavy utilization (Table 09-18.13). Furthermore, on-site observations for 2025 noted the occurrence of a recent nearby fire: this could push additional wildlife onto the study as it is one of the only adjacent areas left with browse populations.

## Trend Summary Tables

**Table 09-18.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 33.2 | 3.0 | - | - | - | - |
| 2000 | 30.0 | 1.9 | - | - | - | - |
| 2005 | 31.4 | 3.9 | - | 46.4 | 5.2 | - |
| 2010 | 34.2 | 2.5 | - | 48.9 | 4.1 | - |
| 2015 | 29.8 | 3.4 | - | 34.1 | 3.7 | - |
| 2025 | 37.9 | 6.2 | - | 46.4 | 4.1 | - |

**Table 09-18.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 391 | 93 | 321 | - | 10.1 | 0.7 | 8.0 |
| 2000 | - | 400 | 26 | 242 | - | 14.0 | 0.2 | 7.3 |
| 2005 | - | 411 | 90 | 300 | - | 16.4 | 0.8 | 15.9 |
| 2010 | - | 362 | 37 | 241 | - | 13.2 | 0.2 | 7.1 |
| 2015 | - | 436 | 81 | 313 | - | 35.8 | 1.3 | 17.8 |
| 2025 | - | 385 | 8 | 236 | - | 15.3 | 0.1 | 7.3 |

**Table 09-18.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 7.0 | 0.0 | 48.6 | 1.0 | 11.6 | 49.9 |
| 2000 | 14.5 | 0.2 | 47.2 | 2.2 | 12.5 | 48.4 |
| 2005 | 12.1 | 0.1 | 28.0 | 1.4 | 9.7 | 62.5 |
| 2010 | 13.0 | 0.3 | 40.6 | 3.9 | 11.3 | 52.8 |
| 2015 | 13.1 | 0.1 | 45.4 | 2.4 | 10.8 | 64.5 |
| 2025 | 12.2 | 0.3 | 36.9 | 0.9 | 11.1 | 56.4 |

**Table 09-18.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | 4 | - | 12 | 20 | 2 |
| 2000 | - | 1 | - | 7 | 10 | - |
| 2005 | - | 3 | - | 18 | 17 | 7 |
| 2010 | - | 5 | - | 21 | 2 | - |
| 2015 | - | 3 | - | 23 | 12 | 3 |
| 2025 | - | 3 | - | 22 | 32 | 1 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 4.7 (11.6) | 7.2 (17.9) | - | 12.1 (29.8) | 47.6 (117.5) | - |
| 2005 | - | 10.2 (25.1) | 8.7 (21.5)* | 42.9 (105.9) | 43.6 (107.6) | - |
| 2010 | - | 14.5 (35.9) | - | 17.4 (43.0) | 18.7 (46.3) | - |
| 2015 | - | 8.7 (21.5) | - | 20.8 (51.3) | 53.0 (130.8) | - |
| 2025 | - | 9.4 (23.3) | - | 33.5 (82.8) | 59.0 (145.7) | - |

*Pellets per acre (ha)

**Table 09-18.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus porteri (Porter brome) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | - | 26 | - | - | - | 101 | 1 | 221 | 31 | 19 | 221 | 86 | 74 | 2 |
| 2000 | - | 2 | - | - | 4 | 43 | - | 222 | 8 | 42 | 244 | 24 | 53 | - |
| 2005 | 3 | 9 | - | 9 | 3 | 49 | 5 | 242 | 26 | 75 | 220 | 35 | 65 | 6 |
| 2010 | - | 5 | - | 20 | 4 | 62 | 0 | 165 | 7 | 53 | 193 | 36 | 72 | 15 |
| 2015 | 7 | 3 | 2 | 11 | 8 | 114 | 18 | 252 | 28 | 86 | 80 | 104 | 140 | 81 |
| 2025 | - | 12 | - | 32 | 3 | 105 | 10 | 259 | 19 | 54 | 98 | 47 | 77 | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | - | 0.1 | - | - | - | 0.4 | 0.0 | 2.4 | 0.3 | 0.1 | 4.0 | 1.8 | 0.9 | 0.0 |
| 2000 | - | 0.1 | - | - | 0.0 | 0.7 | - | 3.7 | 0.2 | 1.1 | 6.6 | 0.8 | 0.8 | - |
| 2005 | 0.0 | 0.2 | - | 0.4 | 0.0 | 0.3 | 0.0 | 4.4 | 0.5 | 1.4 | 6.2 | 1.3 | 1.3 | 0.2 |
| 2010 | - | 0.2 | - | 0.3 | 0.0 | 0.9 | 0.0 | 3.1 | 0.1 | 0.8 | 5.3 | 0.8 | 1.4 | 0.2 |
| 2015 | 0.2 | 0.0 | 0.0 | 0.2 | 0.2 | 2.2 | 0.7 | 8.7 | 1.4 | 2.8 | 2.6 | 8.0 | 5.1 | 3.8 |
| 2025 | - | 0.2 | - | 1.2 | 0.1 | 1.9 | 0.1 | 5.9 | 1.1 | 0.6 | 1.8 | 1.0 | 1.4 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-18.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium cernuum (nodding onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Arenaria (sandwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Astragalus spatulatus (tufted milkvetch) | Astragalus tenellus (looseflower milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 13 | 17 | - | - | 25 | 2 | - | - | 36 | - | - | 31 | 31 | - | 37 | 21 | 24 |
| 2000 | - | - | - | - | 39 | 10 | - | - | 16 | - | 12 | 7 | 7 | - | 1 | - | 5 |
| 2005 | 8 | - | 4 | 1 | 30 | 15 | - | - | 60 | - | 14 | 12 | 25 | 2 | 24 | 0 | 11 |
| 2010 | 6 | - | 3 | - | 20 | 3 | - | - | 21 | - | 42 | 20 | 22 | 6 | 5 | 5 | 19 |
| 2015 | 4 | 21 | 31 | 15 | 42 | 5 | - | 6 | 57 | 2 | 21 | 12 | 22 | 2 | 61 | 10 | 2 |
| 2025 | 4 | 1 | - | - | 15 | 5 | 1 | - | 48 | - | 2 | 5 | 8 | - | - | - | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.1 | - | - | 0.2 | 0.0 | - | - | 0.4 | - | - | 0.6 | 0.4 | - | 0.1 | 0.3 | 0.2 |
| 2000 | - | - | - | - | 1.1 | 0.1 | - | - | 0.3 | - | 0.7 | 0.1 | 0.1 | - | 0.0 | - | 0.0 |
| 2005 | 0.0 | - | 0.0 | 0.0 | 1.1 | 0.1 | - | - | 1.3 | - | 0.1 | 0.3 | 0.5 | 0.1 | 0.1 | 0.0 | 0.1 |
| 2010 | 0.1 | - | 0.0 | - | 0.8 | 0.0 | - | - | 0.1 | - | 0.4 | 0.4 | 0.2 | 0.1 | 0.0 | 0.1 | 0.1 |
| 2015 | 0.0 | 0.1 | 0.5 | 0.2 | 1.4 | 0.0 | - | 0.0 | 1.5 | 0.0 | 0.4 | 0.4 | 0.6 | 0.2 | 0.4 | 0.1 | 0.0 |
| 2025 | 0.0 | 0.0 | - | - | 0.6 | 0.0 | 0.0 | - | 0.7 | - | 0.0 | 0.1 | 0.1 | - | - | - | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Chaenactis douglasii (Douglas' dustymaiden) | Chaetopappa ericoides (rose heath) | Cirsium undulatum[a] (wavyleaf thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Cordylanthus ramosus[a] (bushy bird's beak) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Cynoglossum officinale[ani] (gypsyflower) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Geranium richardsonii (Richardson's geranium) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 3 | - | 10 | 37 | 29 | 53 | - | 46 | - | 61 | 2 | 60 | - | 29 | - | 16 | 1 |
| 2000 | 3 | - | 7 | 9 | - | 29 | - | 9 | - | - | - | 14 | - | 9 | - | 11 | - |
| 2005 | 2 | 7 | 2 | 17 | 23 | 40 | 9 | 61 | 2 | 53 | 8 | 37 | - | 10 | - | 12 | 0 |
| 2010 | - | 2 | 1 | 8 | 13 | 27 | 5 | 18 | - | 6 | - | 14 | - | 22 | 4 | 17 | 1 |
| 2015 | 10 | 10 | 7 | - | 8 | 25 | - | 57 | 10 | 16 | 1 | 19 | 8 | 17 | 5 | 4 | - |
| 2025 | - | - | 0 | - | 3 | 28 | - | 19 | 3 | 7 | - | 56 | - | 4 | - | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.1 | 0.3 | 0.2 | 0.2 | - | 0.3 | - | 0.2 | 0.0 | 0.5 | - | 0.1 | - | 0.3 | 0.0 |
| 2000 | 0.0 | - | 0.1 | 0.1 | - | 0.4 | - | 0.1 | - | - | - | 0.1 | - | 0.1 | - | 0.1 | - |
| 2005 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 0.4 | 0.0 | 1.3 | 0.0 | 0.8 | 0.0 | 0.6 | - | 0.1 | - | 0.3 | 0.0 |
| 2010 | - | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | - | 0.0 | - | 0.1 | - | 0.2 | 0.0 | 0.2 | 0.0 |
| 2015 | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.2 | - | 0.6 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.2 | 0.1 | 0.0 | - |
| 2025 | - | - | 0.0 | - | 0.0 | 0.1 | - | 0.1 | 0.0 | 0.0 | - | 0.5 | - | 0.0 | - | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Hedysarum boreale (Utah sweetvetch) | Heliomeris multiflora var. multiflora (showy goldeneye) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Lithophragma (woodland-star) | Lithospermum (stoneseed) | Lupinus argenteus (silvery lupine) | Lygodesmia grandiflora (largeflower skeletonplant) | Machaeranthera canescens (hoary tansyaster) | Microsteris gracilis[a] (slender phlox) | Orthocarpus tolmiei[a] (Tolmie's owl's-clover) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon caespitosus (mat penstemon) | Penstemon dolius (Jones' beardtongue) | Penstemon fremontii (Fremont's beardtongue) | Penstemon humilis (low beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | 8 | 56 | 1 | - | - | 21 | 6 | 29 | 10 | 8 | - | - |
| 2000 | - | - | - | - | - | 5 | 57 | - | 5 | - | - | 5 | - | 7 | - | - | - |
| 2005 | 1 | - | - | 2 | - | 1 | 70 | - | - | 3 | 13 | 4 | - | 17 | - | 6 | 17 |
| 2010 | 3 | - | 2 | - | - | 2 | 51 | - | 2 | 3 | 1 | 6 | - | 34 | - | - | 6 |
| 2015 | 4 | 3 | 8 | - | 1 | - | 53 | - | 3 | 5 | 3 | 13 | - | 24 | - | - | 6 |
| 2025 | - | - | - | - | 14 | 6 | 26 | - | - | - | - | 2 | - | 15 | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | 0.0 | 0.9 | 0.0 | - | - | 0.2 | 0.0 | 0.2 | 0.1 | 0.2 | - | - |
| 2000 | - | - | - | - | - | 0.0 | 0.9 | - | 0.0 | - | - | 0.0 | - | 0.1 | - | - | - |
| 2005 | 0.0 | - | - | 0.0 | - | 0.0 | 4.3 | - | - | 0.0 | 0.0 | 0.0 | - | 0.3 | - | 0.2 | 0.2 |
| 2010 | 0.1 | - | 0.0 | - | - | 0.0 | 1.3 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.4 | - | - | 0.0 |
| 2015 | 0.0 | 0.0 | 0.2 | - | 0.0 | - | 2.2 | - | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.8 | - | - | 0.0 |
| 2025 | - | - | - | - | 0.1 | 0.1 | 0.4 | - | - | - | - | 0.0 | - | 0.1 | - | - | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon pachyphyllus (thickleaf beardtongue) | Penstemon watsonii (Watson's penstemon) | Petradoria pumila (rock goldenrod) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Silene drummondii (Drummond's campion) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 1 | - | 27 | 78 | 68 | 3 | 18 | 17 | 3 | 5 | 21 | 46 | 18 | 4 | - | - | - |
| 2000 | 9 | - | 36 | 35 | 9 | - | - | 7 | - | 3 | 19 | 42 | 10 | 1 | - | - | 3 |
| 2005 | - | 5 | 34 | 51 | 28 | - | 7 | 18 | 1 | 12 | 27 | 49 | 15 | 8 | - | 15 | 5 |
| 2010 | - | 5 | 19 | 56 | 12 | - | 3 | 19 | - | - | 14 | 25 | - | 6 | 1 | - | 8 |
| 2015 | - | 12 | 38 | 47 | 23 | - | 3 | 33 | 1 | 7 | 36 | 77 | 21 | 17 | - | 13 | - |
| 2025 | 2 | - | 17 | 50 | - | - | - | 13 | - | - | 28 | 71 | - | - | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.7 | 0.9 | 0.2 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.3 | 0.1 | 0.1 | - | - | - |
| 2000 | 0.2 | - | 0.7 | 1.4 | 0.1 | - | - | 0.0 | - | 0.0 | 0.4 | 0.3 | 0.1 | 0.0 | - | - | 0.0 |
| 2005 | - | 0.2 | 1.0 | 0.6 | 0.2 | - | 0.0 | 0.3 | 0.0 | 0.1 | 0.3 | 0.6 | 0.2 | 0.0 | - | 0.3 | 0.0 |
| 2010 | - | 0.0 | 0.2 | 0.9 | 0.0 | - | 0.0 | 0.3 | - | - | 0.2 | 0.3 | - | 0.0 | 0.0 | - | 0.0 |
| 2015 | - | 0.2 | 1.8 | 1.5 | 0.3 | - | 0.0 | 0.6 | 0.0 | 0.0 | 0.7 | 2.5 | 0.2 | 0.2 | - | 0.3 | - |
| 2025 | 0.0 | - | 0.5 | 1.1 | - | - | - | 0.2 | - | - | 0.4 | 1.5 | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Zigadenus elegans (mountain deathcamas) |
|---|---|
| year | Nested |
| 1995 | 3 |
| 2000 | - |
| 2005 | 11 |
| 2010 | 12 |
| 2015 | 1 |
| 2025 | 5 |
| year | Average Cover (%) |
| 1995 | 0.0 |
| 2000 | - |
| 2005 | 0.1 |
| 2010 | 0.1 |
| 2015 | 0.0 |
| 2025 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-18.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Echinocereus (hedgehog cactus) | Eriogonum corymbosum (crispleaf buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Pediocactus simpsonii (mountain ball cactus) | Purshia tridentata[p] (antelope bitterbrush) | Ribes cereum var. cereum[p] (wax currant) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 10.5 | 0 | 4.8 | 5.5 | - | 3.5 | - | 0.1 | 1.6 | - | - | 4.3 | 0.4 | 20.9 | - |
| 2010 | 14.1 | - | 6 | 4 | 0.2 | 2.6 | - | - | 1.4 | - | - | 4.5 | 0.5 | 19.6 | 0.1 |
| 2015 | 9.1 | - | 6 | 5.9 | - | 3.4 | - | - | 0.3 | - | - | 2.2 | 0.4 | 10.5 | - |
| 2025 | 11.4 | - | 5.6 | 4.5 | - | 1.9 | - | - | 2.2 | - | - | 6.5 | - | 18.4 | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | |
| 1995 | 6.8 | - | 4.4 | 7.9 | 0.1 | 2.4 | 0.0 | 0.1 | 0.2 | 0.2 | - | 2.8 | 0.0 | 11.1 | 0.0 |
| 2000 | 6.5 | - | 3.3 | 6.4 | 0.2 | 1.7 | 0.0 | - | 0.2 | - | - | 3.3 | - | 10.3 | 0.0 |
| 2005 | 6.5 | 0.0 | 4.2 | 5.0 | 0.2 | 2.3 | - | 0.0 | 1.3 | 0.2 | 0.0 | 2.6 | 0.6 | 12.4 | 0.1 |
| 2010 | 9.6 | - | 4.9 | 3.4 | 0.0 | 1.8 | - | 0.1 | 0.6 | - | 0.0 | 4.8 | 0.4 | 11.1 | 0.0 |
| 2015 | 5.9 | 0.1 | 4.8 | 2.5 | 0.0 | 3.2 | - | - | 0.1 | 0.0 | 0.0 | 3.0 | 0.0 | 13.3 | - |
| 2025 | 7.7 | - | 4.9 | 3.9 | 0.0 | 2.9 | 0.0 | 0.0 | 3.2 | - | 0.0 | 6.6 | - | 14.8 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-18.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 1240 | 40 | 26 | 73 | 2 | 27 | 21 | 0 | 90/105 |
| 2000 | 1380 | 80 | 19 | 71 | 10 | 26 | 35 | 6 | 83/87 |
| 2005 | 1380 | 20 | 17 | 68 | 14 | 16 | 74 | 9 | 107/108 |
| 2010 | 1940 | - | 35 | 64 | 1 | 32 | 16 | 5 | 104/115 |
| 2015 | 1600 | 20 | 5 | 74 | 21 | 26 | 70 | 25 | 82/87 |
| 2025 | 2260 | - | 19 | 74 | 8 | 43 | 31 | 10 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/22 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/44 |
| 2015 | 140 | - | 100 | 0 | 0 | 0 | 0 | 0 | 22/18 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 4360 | 200 | 28 | 67 | 6 | 47 | 6 | 5 | 25/50 |
| 2000 | 2900 | 200 | 1 | 89 | 10 | 3 | 1 | 3 | 27/48 |
| 2005 | 4700 | 1520 | 15 | 72 | 12 | 2 | 0 | 8 | 26/44 |
| 2010 | 6260 | 440 | 43 | 51 | 6 | 3 | 5 | 3 | 22/39 |
| 2015 | 4760 | 100 | 20 | 79 | 1 | 10 | 62 | 3 | 21/46 |
| 2025 | 3260 | 120 | 10 | 70 | 20 | 32 | 21 | 20 | - / - |

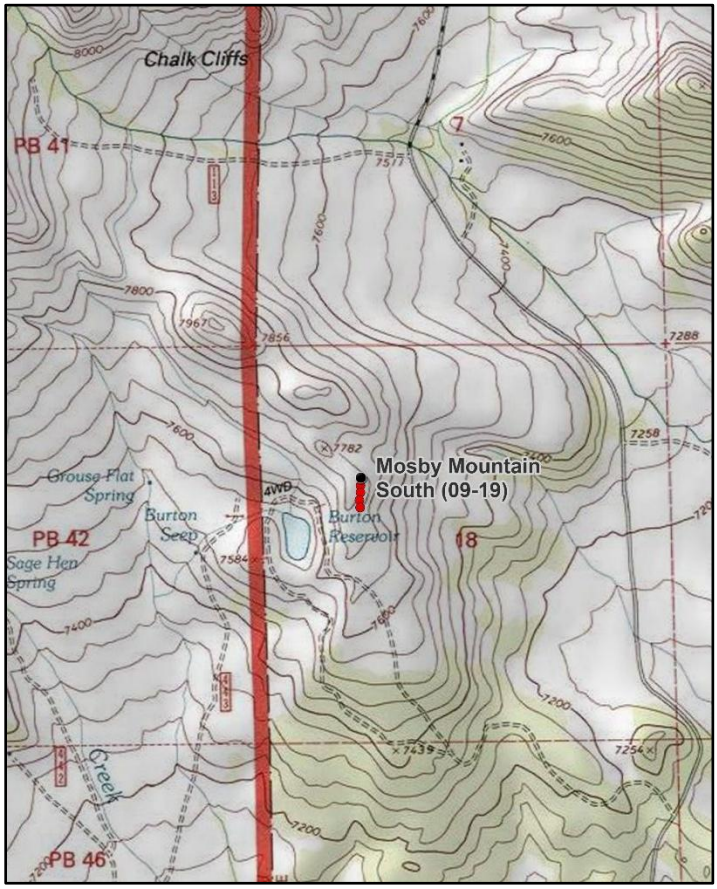
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2420 | - | 6 | 86 | 8 | 60 | 8 | 9 | 53/74 |
| 2000 | 2360 | 60 | 13 | 77 | 10 | 18 | 4 | 24 | 53/68 |
| 2005 | 1640 | 220 | 11 | 49 | 40 | 39 | 15 | 26 | 53/79 |
| 2010 | 2640 | 260 | 36 | 53 | 11 | 9 | 26 | 12 | 51/75 |
| 2015 | 2040 | 80 | 14 | 70 | 17 | 28 | 41 | 13 | 43/66 |
| 2025 | 2180 | 120 | 4 | 84 | 13 | 39 | 11 | 13 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 100 | - | 60 | 40 | 0 | 0 | 0 | 0 | 14/30 |
| 2000 | 180 | - | 11 | 89 | 0 | 0 | 0 | 0 | 12/24 |
| 2005 | 220 | - | 0 | 100 | 0 | 18 | 0 | 0 | 8/19 |
| 2010 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 120 | 20 | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2025 | 100 | - | 0 | 40 | 60 | 0 | 20 | 60 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 3220 | - | 17 | 83 | 0 | 1 | 0 | 0 | 31/33 |
| 2000 | 2160 | - | 30 | 67 | 4 | 5 | 6 | 0 | 23/25 |
| 2005 | 2240 | - | 8 | 90 | 2 | 0 | 0 | 1 | 28/35 |
| 2010 | 2160 | 20 | 1 | 97 | 2 | 0 | 1 | 3 | 28/32 |
| 2015 | 1740 | 20 | 7 | 93 | 0 | 0 | 0 | 2 | 32/38 |
| 2025 | 1840 | - | 0 | 95 | 5 | 10 | 2 | 9 | - / - |
| Echinocereus -- (hedgehog cactus) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 4/11 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/30 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/15 |
| 2010 | 120 | - | 17 | 83 | 0 | 0 | 17 | 0 | 20/31 |
| 2015 | - | - | - | - | - | - | - | - | 35/18 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 32/33 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 580 | - | 24 | 76 | 0 | 0 | 0 | 0 | 19/26 |
| 2000 | 1040 | - | 4 | 96 | 0 | 0 | 0 | 0 | 11/13 |
| 2005 | 3060 | - | 11 | 89 | 0 | 0 | 0 | 0 | 17/24 |
| 2010 | 2620 | - | 2 | 98 | 0 | 0 | 0 | 0 | 16/20 |
| 2015 | 560 | 220 | 7 | 93 | 0 | 0 | 0 | 0 | 16/19 |
| 2025 | 4360 | 80 | 3 | 97 | 0 | 0 | 0 | 0 | - / - |

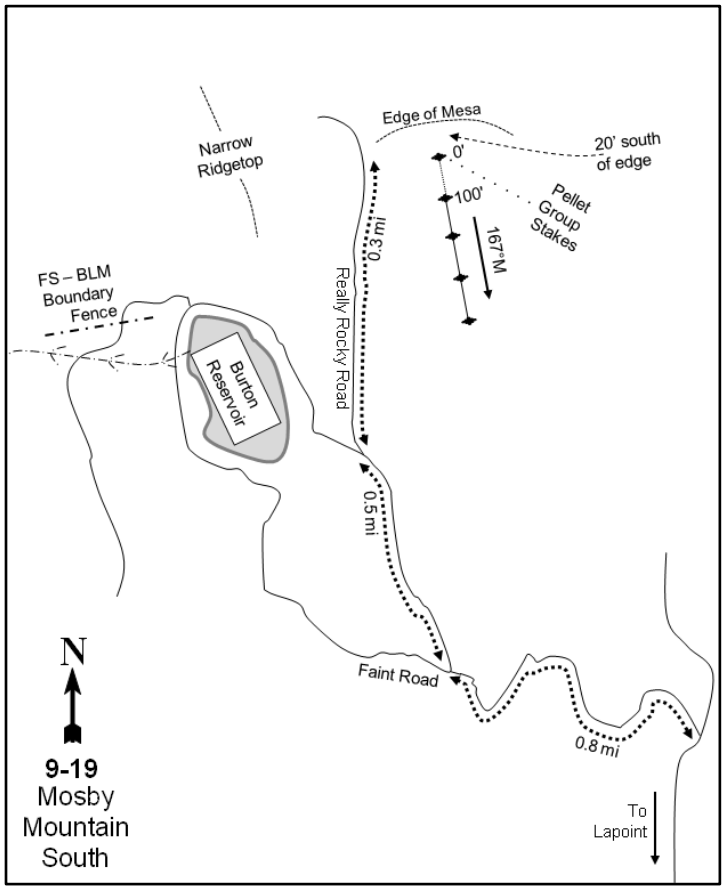
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/16 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/12 |
| 2010 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/10 |
| 2015 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | 7/13 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2010 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | 4/9 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/8 |
| 2025 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 520 | - | 4 | 92 | 4 | 62 | 4 | 0 | 39/95 |
| 2000 | 420 | - | 10 | 91 | 0 | 24 | 24 | 0 | 47/104 |
| 2005 | 520 | - | 0 | 92 | 8 | 4 | 96 | 0 | 54/130 |
| 2010 | 620 | - | 13 | 87 | 0 | 36 | 48 | 10 | 52/128 |
| 2015 | 640 | - | 22 | 72 | 6 | 34 | 38 | 6 | 46/115 |
| 2025 | 800 | - | 3 | 93 | 5 | 55 | 30 | 5 | - / - |
| Quercus gambelii[P] -- (Gambel oak) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ribes cereum var. cereum[P] -- (wax currant) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 74/131 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 100/119 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 148/146 |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 94/109 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[P] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 4400 | 20 | 42 | 58 | 0 | 21 | 6 | 0 | 39/71 |
| 2000 | 4240 | 220 | 18 | 82 | 0 | 1 | 0 | 0 | 38/85 |
| 2005 | 5340 | - | 15 | 84 | 2 | 0 | 0 | 1 | 37/70 |
| 2010 | 6940 | 20 | 14 | 87 | 0 | 2 | 5 | 0 | 36/60 |
| 2015 | 6700 | 60 | 25 | 76 | 0 | 15 | 0 | 0 | 33/62 |
| 2025 | 4820 | - | 6 | 93 | 1 | 22 | 9 | 1 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 240 | - | 42 | 58 | 0 | 0 | 0 | 0 | 24/23 |
| 2000 | 60 | - | 67 | 33 | 0 | 0 | 33 | 0 | 16/16 |
| 2005 | 140 | - | 71 | 29 | 0 | 14 | 0 | 0 | 22/27 |
| 2010 | 100 | - | 60 | 20 | 20 | 0 | 0 | 20 | 20/23 |
| 2015 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | 24/84 |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Yucca -- (yucca) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# MOSBY MOUNTAIN SOUTH - STUDY NO. 09-19




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Lake Mountain SW; Township 3S, Range 19E, Section 18 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 598210 East 4490354 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7870 |
| Transect Bearing | 167° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belts 1-2, 5: No Rebar |

## Directions to Site

Just east of Lapoint, turn north onto Paradise Park Road from Highway 121. Go 6.9 miles to a fork and keep left towards Mosby Mountain. Proceed 4.8 miles and turn left onto a dirt road heading west. Travel 0.2 miles to a three-way intersection and turn left on the main road. Continue 0.5 miles to a fork and stay to the left. Go 0.2 miles to another fork and stay to the right. Continue 0.5 miles to an intersection on the ridge above Burton Reservoir. Drive 0.3 miles north on a very rocky road to the study site. A tall, bent, and twisted fence post is the 0-foot baseline stake and is marked by browse tag #7870.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | MOSBY |
| Elevation | 8,000ft (2,438m) |
| Aspect | Southeast |
| Slope | 2-3% |
| Sample Dates | 08/11/1995, 07/18/2000, 07/12/2005, 08/05/2010, 07/15/2015, 07/08/2020, 06/17/2025 |

**Table 09-19.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Whiterocks | - | September 1988 | 16600 |
| Seeding - Aerial After | Whiterocks Fire Rehabilitation 1988 | - | Fall 1988-Spring 1989 | 1160 |

**Table 09-19.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Whiterocks Fire Rehabilitation | | | Aerial | Oct 1988 | 1160 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | Hycrest | 8.00 | 0.00 |
| G | Thinopyrum intermedium | Intermediate Wheatgrass | | 5.00 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 1.00 | 0.00 |
| F | Sanguisorba minor | Small Burnet | | 1.00 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 6.00 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 09-19.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |

**Table 09-19.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Mountain Big Sagebrush | No Encroachment |
| 1995 | Perennial Grass-Forb | Early Phase I |
| 2000 | Perennial Grass-Forb | Early Phase I |
| 2005 | Perennial Grass-Forb | Early Phase I |
| 2010 | Perennial Grass-Forb/Mixed Mountain Brush | Early Phase I |
| 2015 | Perennial Grass-Forb/Mixed Mountain Brush | Early Phase I |
| 2020 | Mixed Mountain Brush/Perennial Grass | Early Phase I |
| 2025 | Mixed Mountain Brush/Perennial Grass | Early Phase I |

## Site Notes

To the east of the site is a sagebrush (*Artemisia* spp.), twoneedle pinyon (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*)-filled valley. A large fire burned the entire area after the initial reading in 1988 and the majority of the sagebrush was eradicated. Springs are common in the area and most have been developed for cattle. Cattle were present on the site in 2000, but it was noted that most of the cattle were distributed close to the reservoir about a half mile away.

## Soils

**Table 09-19.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.6 | 72.0 | 13.4 | 14.6 | 8.0 | 19.6 | 208.0 | 0.6 | 07/18/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1988, the plant community on this site was primarily composed of mixed mountain brush with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant shrub species (Photos, Pre-1992 Data). Following a fire and subsequent chaining and seeding that occurred in 1988 (Table 09-19.1), the site transitioned to a perennial grass/forb plant community type (Table 09-19.7). Shrubs have steadily reestablished over time (Table 09-19.6). As of 2025, the site is transitioning back to a mixed mountain brush community that includes preferred browse species such as mountain big sagebrush, antelope bitterbrush (*Purshia tridentata*), and Utah serviceberry (*Amelanchier utahensis*) (Table 09-19.12, Table 09-19.13). The herbaceous understory has remained diverse and abundant over the sample years. Perennial grasses, particularly needle and thread (*Hesperostipa comata*) and the seeded species crested wheatgrass (*Agropyron cristatum*), have contributed much of the herbaceous cover and havebeen a co-dominant vegetation component following the burn (Table 09-19.2, Table 09-19.10, Table 09-19.11). Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have been scattered throughout the area (Photos, Table 09-19.13). However, the site has been considered to be within Early Phase I of woodland succession since 1995 (Table 09-19.4), indicating that

further tree encroachment is likely not an immediate concern. Without a major disturbance, the site will likely continue to be dominated by mixed mountain brush with a perennial grass understory.

Overall deer winter range condition has improved from poor-fair to good-excellent since 1995. Condition improvement can be attributed to the increase in preferred browse cover and recruitment. However, recruitment of young preferred browse plants has decreased since 2010. In 2025, deer winter range condition was considered to be fair. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-19.6, Table 09-19.7, Table 09-19.13, Table 09-19.15). Pellet transect data shows that deer presence has increased over the sample period from low to high levels (Table 09-19.9). During the 2024/25 winter season the area had nearby (Grouse Creek area) frequent occurrences of collared mule deer, but the site itself had infrequent or occasional occurrences (Wildlife Migration Initiative). Utilization of preferred browse has fluctuated between species and over time. In 2025, 80% of mountain big sagebrush plants sampled in density strips showed signs of little to no browsing. During the same year, however, 50% of Utah serviceberry and 98% of antelope bitterbrush plants were moderately to heavily hedged (Table 09-19.13).

## Trend Summary Tables

**Table 09-19.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 5.5 | 1.3 | - | - | - | - |
| 2000 | 7.7 | 1.1 | - | - | - | - |
| 2005 | 12.2 | 1.3 | - | 14.2 | 1.8 | - |
| 2010 | 15.1 | 2.5 | - | 21.4 | 2.5 | - |
| 2015 | 15.1 | 1.3 | - | 23.6 | 1.8 | - |
| 2020 | 25.5 | 2.4 | 0.0 | 32.0 | 2.8 | - |
| 2025 | 26.8 | 2.8 | - | 33.0 | 1.5 | - |

**Table 09-19.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 351 | 389 | 113 | 206 | 3.6 | 13.2 | 0.5 | 7.7 |
| 2000 | 6 | 394 | 4 | 250 | 0.0 | 18.9 | 0.0 | 10.5 |
| 2005 | 269 | 402 | 58 | 195 | 3.4 | 22.7 | 0.4 | 12.2 |
| 2010 | 159 | 369 | 16 | 201 | 0.7 | 15.8 | 0.1 | 4.8 |
| 2015 | 251 | 390 | 59 | 242 | 4.8 | 14.1 | 0.2 | 8.5 |
| 2020 | 158 | 403 | 110 | 184 | 1.7 | 17.6 | 0.7 | 6.2 |
| 2025 | 37 | 374 | 23 | 175 | 0.1 | 18.4 | 0.1 | 5.5 |

**Table 09-19.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 3.9 | 0.1 | 45.9 | 2.9 | 26.6 | 39.6 |
| 2000 | 10.0 | 0.1 | 37.0 | 5.9 | 25.9 | 41.7 |
| 2005 | 7.7 | 0.0 | 20.6 | 3.7 | 29.9 | 50.3 |
| 2010 | 10.0 | 0.1 | 38.5 | 5.5 | 25.7 | 39.2 |
| 2015 | 7.1 | 0.1 | 32.7 | 3.5 | 25.1 | 45.7 |
| 2020 | 9.0 | 0.3 | 31.2 | 6.8 | 32.3 | 48.9 |
| 2025 | 11.2 | 0.2 | 35.7 | 3.2 | 30.0 | 44.1 |

**Table 09-19.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 1 | 19 | 28 | - | 3 |
| 2000 | 7 | 6 | 12 | 1 | 13 |
| 2005 | 10 | 16 | 10 | 4 | 42 |
| 2010 | 9 | 16 | 3 | 2 | 6 |
| 2015 | 7 | 23 | 10 | - | 39 |
| 2020 | 7 | 20 | 9 | 1 | 7 |
| 2025 | 2 | 31 | 2 | - | 13 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 8.7 (21.5) | 6.7 (16.6) | 14.7 (36.4) | 34.9 (86.1)* | - |
| 2005 | 21.8 (53.8) | 28.8 (71.2) | 4.0 (9.9) | 52.3 (129.1)* | - |
| 2010 | 8.0 (19.7) | 28.8 (71.2) | 6.0 (14.9) | 78.4 (193.7)* | - |
| 2015 | 9.4 (23.3) | 20.1 (49.7) | 2.0 (5.0) | - | - |
| 2020 | 8.0 (19.7) | 38.2 (94.4) | 0.7 (1.7) | - | - |
| 2025 | 14.5 (35.9) | 60.3 (149.0) | - | 17.4 (43.0)* | - |

*Pellets per acre (ha)

**Table 09-19.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus arvensis[ai] (field brome) | Bromus tectorum[ai] (cheatgrass) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 162 | 3 | - | 351 | 10 | 42 | 87 | - | 198 | - | 4 | 44 | 2 | 35 | 2 | 36 |
| 2000 | - | 181 | - | - | 6 | 13 | 20 | 4 | - | 241 | - | 27 | 5 | 22 | 18 | 8 | 2 |
| 2005 | 0 | 199 | - | 2 | 269 | 7 | 111 | 53 | 3 | 235 | 7 | 47 | 5 | 5 | 60 | - | 15 |
| 2010 | - | 255 | 7 | 4 | 155 | 11 | 39 | 15 | - | 189 | 6 | 41 | 8 | 12 | - | - | 38 |
| 2015 | - | 218 | 5 | 60 | 228 | 13 | 35 | 36 | - | 112 | 3 | 86 | 3 | 52 | 53 | - | 37 |
| 2020 | 4 | 278 | 3 | 23 | 142 | 3 | 22 | 37 | - | 125 | 3 | 85 | 9 | 70 | 5 | - | 34 |
| 2025 | - | 254 | 14 | 5 | 32 | 3 | 22 | 15 | 1 | 141 | 16 | 61 | 9 | 24 | 3 | - | 73 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 3.3 | 0.0 | - | 3.6 | 0.0 | 0.3 | 2.0 | - | 5.8 | - | 0.0 | 0.9 | 0.0 | 0.6 | 0.0 | 0.3 |
| 2000 | - | 5.8 | - | - | 0.0 | 0.1 | 0.5 | 0.0 | - | 11.2 | - | 0.3 | 0.2 | 0.3 | 0.4 | 0.0 | 0.0 |
| 2005 | 0.0 | 6.8 | - | 0.0 | 3.4 | 0.1 | 2.4 | 0.6 | 0.0 | 8.7 | 0.4 | 1.3 | 0.1 | 0.0 | 2.1 | - | 0.3 |
| 2010 | - | 8.4 | 0.2 | 0.0 | 0.7 | 0.0 | 0.5 | 0.0 | - | 5.1 | 0.1 | 0.7 | 0.2 | 0.1 | - | - | 0.4 |
| 2015 | - | 5.1 | 0.4 | 0.4 | 4.4 | 0.0 | 0.5 | 0.4 | - | 2.6 | 0.1 | 2.5 | 0.0 | 0.8 | 1.1 | - | 0.8 |
| 2020 | 0.2 | 9.6 | 0.0 | 0.2 | 1.5 | 0.0 | 0.3 | 0.3 | - | 3.1 | 0.1 | 1.4 | 0.2 | 1.2 | 0.0 | - | 1.2 |
| 2025 | - | 8.7 | 0.3 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 5.2 | 0.9 | 1.6 | 0.1 | 0.2 | 0.1 | - | 0.8 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-19.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Alyssum desertorum[ai] (desert madwort) | Arabis demissa (nodding rockcress) | Artemisia ludoviciana (white sagebrush) | Astragalus purshii (woollypod milkvetch) | Balsamorhiza hookeri (Hooker's balsamroot) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 5 | - | 3 | - | - | 3 | - | - | - | - | 15 | 8 | 32 | - | 1 | - |
| 2000 | - | - | - | 2 | 3 | - | - | - | - | - | - | - | 2 | - | 1 | - | - |
| 2005 | 7 | 19 | - | 13 | - | - | 1 | - | - | - | 2 | - | 32 | 9 | 4 | - | 3 |
| 2010 | 2 | 8 | - | - | - | - | 4 | - | 2 | - | 6 | - | 9 | - | 10 | 4 | - |
| 2015 | 3 | - | - | - | - | 2 | - | - | - | 5 | 1 | - | - | - | 9 | 22 | - |
| 2020 | 5 | 5 | 8 | 13 | - | 2 | 1 | - | - | - | - | - | 40 | 10 | 7 | 2 | 4 |
| 2025 | 6 | 20 | 6 | 7 | - | 1 | 1 | 1 | - | - | - | - | 4 | - | 9 | 5 | 11 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.1 | - | 0.0 | - |
| 2000 | - | - | - | 0.0 | 0.1 | - | - | - | - | - | - | - | 0.0 | - | 0.0 | - | - |
| 2005 | 0.0 | 0.1 | - | 0.1 | - | - | 0.2 | - | - | - | 0.0 | - | 0.1 | 0.0 | 0.0 | - | 0.0 |
| 2010 | 0.0 | 0.0 | - | - | - | - | 0.0 | - | 0.0 | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | - |
| 2015 | 0.0 | - | - | - | - | 0.0 | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.1 | - |
| 2020 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | - | - | - | - | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 |
| 2025 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | - | - | 0.0 | - | 0.2 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Erigeron divergens[a] (spreading fleabane) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum heracleoides (parsnipflower buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Helianthella uniflora (oneflower helianthella) | Heterotheca villosa (hairy false goldenaster) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 8 | 1 | - | - | 1 | - | - | 10 | 6 | - | - | 161 | 3 | 45 | - | - | 43 |
| 2000 | - | - | - | - | 2 | - | - | 8 | 3 | - | - | 190 | - | 2 | 4 | - | 76 |
| 2005 | - | 6 | 7 | 1 | 2 | - | - | 3 | 9 | - | - | 150 | 1 | 7 | - | 7 | 38 |
| 2010 | - | - | 5 | - | - | - | - | 5 | 15 | - | - | 154 | - | - | - | 3 | 39 |
| 2015 | 6 | 18 | 17 | - | 12 | - | - | - | 18 | 3 | - | 170 | - | 14 | - | - | 80 |
| 2020 | - | - | 16 | 4 | 15 | - | 7 | - | 7 | 1 | - | 87 | 3 | - | - | 7 | 63 |
| 2025 | 3 | 2 | - | - | 5 | 1 | 3 | - | 8 | 1 | 1 | 51 | - | - | - | - | 100 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | - | - | 0.0 | - | - | 0.7 | 0.2 | - | - | 4.7 | 0.0 | 0.2 | - | - | 1.8 |
| 2000 | - | - | - | - | 0.0 | - | - | 0.4 | 0.1 | - | - | 6.9 | - | 0.0 | 0.0 | - | 2.7 |
| 2005 | - | 0.0 | 0.1 | 0.0 | 0.0 | - | - | 0.4 | 0.1 | - | - | 7.6 | 0.0 | 0.0 | - | 0.1 | 3.3 |
| 2010 | - | - | 0.1 | - | - | - | - | 0.2 | 0.3 | - | - | 3.2 | - | - | - | 0.0 | 0.7 |
| 2015 | 0.0 | 0.0 | 0.1 | - | 0.2 | - | - | - | 0.1 | 0.1 | - | 3.7 | - | 0.0 | - | - | 3.6 |
| 2020 | - | - | 0.1 | 0.0 | 0.1 | - | 0.1 | - | 0.1 | 0.0 | - | 1.8 | 0.0 | - | - | 0.0 | 3.0 |
| 2025 | 0.0 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 1.1 | - | - | - | - | 3.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera grindelioides (rayless tansyaster) | Oenothera pallida ssp. pallida (pale evening primrose) | Packera multilobata (lobeleaf groundsel) | Penstemon humilis (low beardtongue) | Petradoria pumila (rock goldenrod) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | - | - | 5 | 5 | 3 | - | 31 | 12 | - | 4 | 3 | 1 | 10 | - |
| 2000 | - | - | 9 | - | - | - | - | 2 | - | 12 | - | - | - | - |
| 2005 | 1 | - | 3 | 4 | 4 | - | 10 | 11 | - | - | 3 | - | 1 | - |
| 2010 | 2 | - | 3 | 5 | 1 | - | 2 | 11 | - | - | - | - | 2 | - |
| 2015 | 30 | 1 | 7 | 15 | 0 | - | - | 25 | 1 | - | - | 3 | 9 | 3 |
| 2020 | - | - | - | 12 | 4 | 2 | 63 | 36 | 0 | - | - | - | 1 | - |
| 2025 | - | - | 4 | 4 | 2 | 3 | 8 | 23 | - | - | 4 | 7 | - | 1 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | - | - | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.1 | - |
| 2000 | - | - | 0.1 | - | - | - | - | 0.0 | - | 0.1 | - | - | - | - |
| 2005 | 0.0 | - | 0.1 | 0.1 | 0.1 | - | 0.0 | 0.1 | - | - | 0.0 | - | 0.0 | - |
| 2010 | 0.0 | - | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.1 | - | - | - | - | 0.0 | - |
| 2015 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | - | - | 0.2 | 0.0 | - | - | 0.0 | 0.0 | 0.0 |
| 2020 | - | - | - | 0.2 | 0.1 | 0.0 | 0.3 | 0.5 | 0.0 | - | - | - | 0.0 | - |
| 2025 | - | - | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | - | - | 0.0 | 0.1 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-19.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. glabrata (rubber rabbitbrush) | Eriogonum heracleoides (parsnipflower buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 4.5 | 0.3 | 7 | - | - | 0.1 | 1.3 | - | 0.4 | - | 2.4 |
| 2010 | 5.3 | 0.8 | 11.9 | - | 0.2 | 0.1 | 0.8 | - | 1.3 | 0.1 | 3.4 |
| 2015 | 4.1 | 0.5 | 12.9 | - | - | - | 0.3 | - | 1.4 | 0.1 | 6.1 |
| 2020 | 5.7 | 0.1 | 20.1 | - | - | - | 2.2 | - | 0.6 | - | 6.1 |
| 2025 | 6.8 | - | 19.6 | - | - | - | 0.4 | - | 1.1 | - | 6.6 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1995 | 1.9 | 0.2 | 2.3 | 0.1 | - | - | 0.3 | - | 0.4 | 0.4 | 1.2 |
| 2000 | 2.6 | 0.0 | 3.0 | - | 0.0 | - | 0.6 | - | 0.4 | 0.0 | 2.0 |
| 2005 | 3.9 | 0.5 | 6.0 | - | - | 0.0 | 0.8 | - | 0.5 | 0.0 | 1.8 |
| 2010 | 4.7 | 0.1 | 7.5 | - | 0.5 | 0.0 | 1.1 | - | 0.8 | 0.0 | 2.7 |
| 2015 | 3.6 | 0.2 | 7.4 | - | 0.0 | - | 0.2 | - | 1.1 | 0.0 | 3.9 |
| 2020 | 4.5 | 0.1 | 15.2 | 0.0 | 0.0 | - | 1.4 | 0.0 | 0.9 | 0.0 | 5.6 |
| 2025 | 4.8 | - | 15.6 | - | 0.1 | - | 0.7 | - | 2.0 | - | 6.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-19.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 220 | - | 0 | 100 | 0 | 64 | 18 | 9 | 66/111 |
| 2000 | 220 | - | 0 | 100 | 0 | 46 | 18 | 0 | 69/123 |
| 2005 | 180 | - | 11 | 89 | 0 | 44 | 44 | 0 | 80/147 |
| 2010 | 180 | 20 | 11 | 89 | 0 | 11 | 89 | 0 | 86/139 |
| 2015 | 280 | - | 7 | 86 | 7 | 0 | 86 | 0 | 79/124 |
| 2020 | 300 | - | 20 | 80 | 0 | 20 | 53 | 0 | 97/145 |
| 2025 | 280 | - | 14 | 86 | 0 | 21 | 29 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 240 | - | 17 | 67 | 17 | 67 | 33 | 0 | 18/45 |
| 2000 | 120 | - | 0 | 100 | 0 | 17 | 33 | 0 | 45/70 |
| 2005 | 180 | - | 0 | 89 | 11 | 11 | 0 | 11 | 29/53 |
| 2010 | 280 | - | 0 | 100 | 0 | 0 | 100 | 0 | 24/55 |
| 2015 | 120 | - | 0 | 100 | 0 | 17 | 83 | 0 | 24/59 |
| 2020 | 120 | - | 0 | 83 | 17 | 0 | 0 | 17 | 21/34 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1380 | - | 10 | 59 | 30 | 73 | 3 | 1 | 26/42 |
| 2000 | 1280 | 60 | 0 | 95 | 5 | 36 | 5 | 2 | 36/59 |
| 2005 | 1320 | 440 | 11 | 76 | 14 | 29 | 3 | 6 | 46/80 |
| 2010 | 4440 | 20 | 42 | 53 | 5 | 17 | 23 | 5 | 41/75 |
| 2015 | 3900 | 60 | 17 | 70 | 13 | 49 | 21 | 6 | 35/73 |
| 2020 | 3260 | 80 | 9 | 86 | 5 | 16 | 9 | 7 | 37/74 |
| 2025 | 3680 | 260 | 9 | 87 | 4 | 15 | 5 | 5 | - / - |
| Ceanothus fendleri -- (Fendler's ceanothus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 22/78 |
| 2000 | - | - | - | - | - | - | - | - | 26/103 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/27 |
| 2010 | - | - | - | - | - | - | - | - | 18/56 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 10/97 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/47 |
| 2000 | - | - | - | - | - | - | - | - | 19/42 |
| 2005 | 40 | - | 0 | 50 | 50 | 0 | 0 | 0 | 26/34 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 15/31 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/30 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/49 |
| 2000 | 180 | - | 0 | 100 | 0 | 11 | 0 | 0 | 8/41 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/54 |
| 2010 | 180 | 20 | 0 | 100 | 0 | 0 | 0 | 33 | 8/21 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. glabrata -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 62/61 |
| 2000 | - | - | - | - | - | - | - | - | 69/105 |
| 2005 | - | - | - | - | - | - | - | - | 65/90 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 77/106 |
| 2015 | 60 | - | 67 | 33 | 0 | 0 | 100 | 67 | 48/81 |
| 2020 | 40 | - | 0 | 50 | 50 | 0 | 0 | 0 | 58/142 |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 440 | 40 | 5 | 96 | 0 | 0 | 0 | 0 | 18/23 |
| 2000 | 1980 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/24 |
| 2005 | 2260 | - | 1 | 97 | 3 | 1 | 0 | 2 | 19/22 |
| 2010 | 1620 | - | 17 | 82 | 1 | 0 | 0 | 1 | 17/22 |
| 2015 | 440 | 240 | 23 | 77 | 0 | 5 | 9 | 0 | 11/23 |
| 2020 | 2500 | - | 5 | 95 | 0 | 0 | 0 | 0 | 19/22 |
| 2025 | 1320 | - | 6 | 94 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 580 | - | 24 | 76 | 0 | 0 | 0 | 0 | 7/27 |
| 2000 | 800 | - | 8 | 90 | 3 | 0 | 0 | 0 | 5/25 |
| 2005 | 1220 | - | 30 | 64 | 7 | 0 | 0 | 3 | 6/24 |
| 2010 | 1420 | - | 7 | 93 | 0 | 0 | 0 | 3 | 5/29 |
| 2015 | 2840 | 100 | 13 | 87 | 0 | 0 | 0 | 6 | 6/21 |
| 2020 | 1360 | 60 | 4 | 90 | 6 | 0 | 0 | 4 | 6/22 |
| 2025 | 3660 | - | 28 | 70 | 2 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | 4/8 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 2/8 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/6 |
| 2010 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/10 |
| 2015 | 220 | 20 | 27 | 73 | 0 | 0 | 0 | 9 | 5/10 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/8 |
| 2025 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 320 | 20 | 6 | 94 | 0 | 44 | 44 | 0 | 20/69 |
| 2000 | 380 | - | 21 | 79 | 0 | 11 | 84 | 0 | 18/88 |
| 2005 | 420 | - | 0 | 100 | 0 | 5 | 95 | 0 | 22/103 |
| 2010 | 420 | - | 0 | 100 | 0 | 0 | 95 | 5 | 20/105 |
| 2015 | 620 | - | 7 | 94 | 0 | 39 | 58 | 0 | 22/117 |
| 2020 | 800 | - | 3 | 98 | 0 | 0 | 95 | 0 | 20/123 |
| 2025 | 960 | 20 | 0 | 100 | 0 | 0 | 98 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 8/29 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

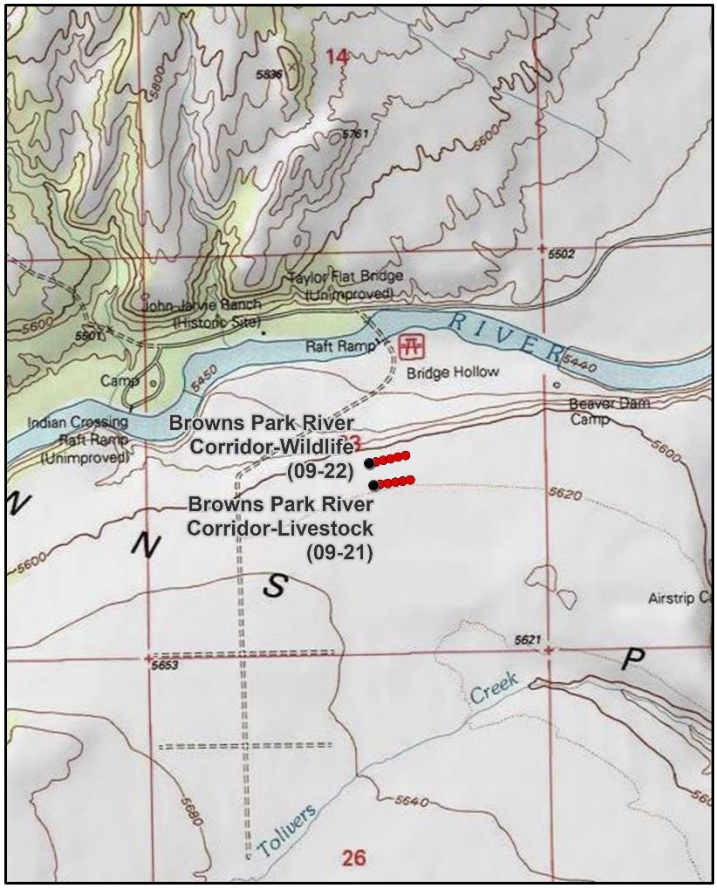
**Table 09-19.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

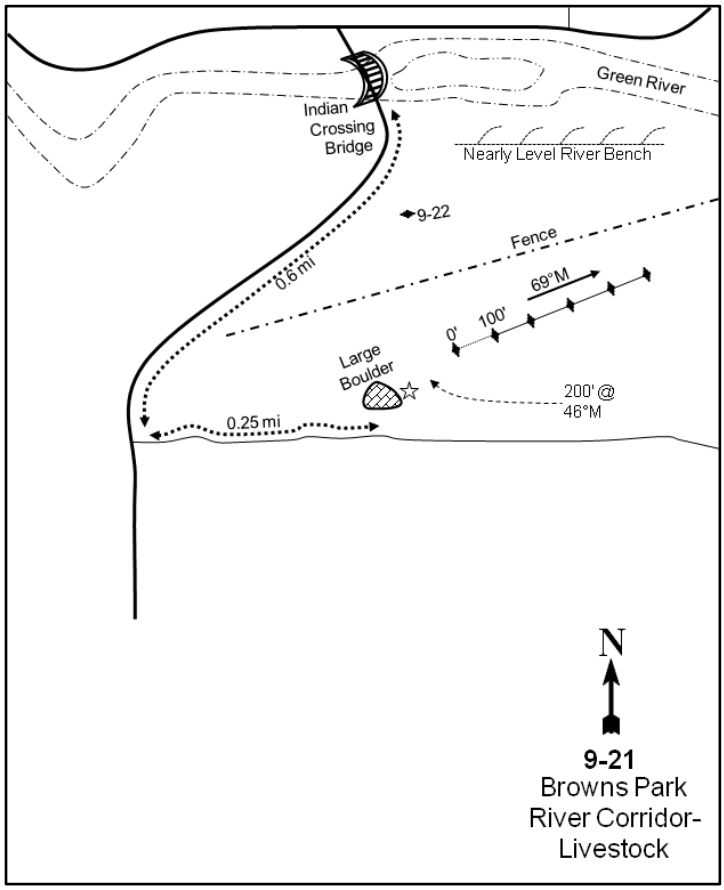
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 1 | 100 | - | - | - | - | 1.0 |
| 2025 | 2 | - | 100 | - | - | - | 3.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 5 | - | 50 | 50 | - | - | 8.0 |
| 2025 | 5 | - | 50 | - | 50 | - | 19.5 |

**Table 09-19.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 7.7 | 11.2 | 3.0 | 26.4 | -2.7 | 10.0 | 0.0 | **55.6** | Poor-Fair |
| 2000 | 10.8 | 14.5 | 2.8 | 30.0 | 0.0 | 10.0 | 0.0 | **68.1** | Fair-Good |
| 2005 | 19.5 | 12.9 | 4.4 | 30.0 | -2.5 | 10.0 | 0.0 | **74.3** | Good |
| 2010 | 28.9 | 14.3 | 13.1 | 30.0 | -0.5 | 9.6 | 0.0 | **95.4** | Excellent |
| 2015 | 30.0 | 12.4 | 6.1 | 28.3 | -3.6 | 10.0 | 0.0 | **83.2** | Good |
| 2020 | 30.0 | 14.1 | 4.9 | 30.0 | -1.3 | 10.0 | 0.0 | **87.7** | Good |
| 2025 | 30.0 | 14.3 | 4.2 | 30.0 | -0.1 | 10.0 | 0.0 | **88.4** | Good-Excellent |

# BROWNS PARK RIVER CORRIDOR-LIVESTOCK - STUDY NO. 09-21




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Clay Basin SE; Township 2N, Range 24E, Section 23 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 653970 East 4528561 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 69° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Indian Crossing Bridge at Brown's Park, travel south for 0.6 miles to a fork. Turn left onto a small road and proceed 0.25 miles. There is a large boulder on the north side of the road. From the boulder, the 0-foot baseline stake is 200 feet away at a bearing of 46 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | No data |
| Elevation | 5,600ft (1,707m) |
| Aspect | North |
| Slope | 3% |
| Sample Dates | 09/19/2000, 07/27/2005, 07/28/2010, 06/23/2015, 07/14/2020, 07/15/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-21.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season | Brood/Young Rearing |
|---|---|---|---|
| Mule Deer | crucial | winter | |
| Greater Sage-Grouse | occupied | year-long & Winter | brood-rearing |

**Table 09-21.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2000 | Mixed Shrub/Perennial Grass | No Encroachment |
| 2005 | Mixed Shrub/Perennial Grass | No Encroachment |
| 2010 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2015 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2020 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2025 | Perennial Grass/Mixed Shrub | No Encroachment |

## Site Notes

The study was placed to monitor differences between livestock and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence line while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line and Brown's Park River Corridor-Wildlife study (09-22) samples the other side. This study samples the south side of the fence that is accessible to livestock and wildlife. The study is approximately one half mile south of the Green River at Brown's Park on a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and grass flat.

## Soils

**Table 09-21.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.8 | 63.6 | 18.1 | 18.3 | 0.8 | 4.1 | 131.2 | 0.5 | 09/19/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 8 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 2000-2025 - Current Potential State: Community Phase 2.1 |

Since study establishment in 2000, the plant community on this site has been dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and the perennial grass species needle and thread (*Hesperostipa comata*). Wyoming big sagebrush cover and density have exhibited overall decreases over the duration of the study, although both measurements increased between 2020 and 2025. Half of the sagebrush plants sampled in density strips were decadent in 2020, but 56% of plants were considered to be mature in 2025 (Table 09-21.12 Table 09-21.13). The herbaceous understory has remained abundant and moderately diverse throughout the study period (Table 09-21.10, Table 09-21.11).

Deer winter range condition has improved slightly from fair to good since 2000; the improvement in condition quality can be attributed to the increase in perennial grass cover. In 2025, deer winter range condition was considered to be good. Further improvement to deer wintering range could be achieved through efforts that increase preferred browse and perennial forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-21.6, Table 09-21.7, Table 09-21.15). Pellet transect data shows that deer and elk presence has varied widely over the sample years, but presence has been more pronounced for the mule deer population. Deer and elk presence was low in 2025 (Table 09-21.9). Utilization of Wyoming big sagebrush has been moderate to high over the course of the study, and 52% of sagebrush plants sampled in density strips were moderately to heavily hedged during the most recent sampling (Table 09-21.13). In addition, on-site observations for 2025 note heavy (>40%) forb utilization, but little to no utilization of grasses.

## Trend Summary Tables

**Table 09-21.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2000 | 10.5 | 7.3 | - | - | - | - |
| 2005 | 11.8 | 0.6 | - | 14.4 | 2.2 | - |
| 2010 | 6.5 | 0.8 | - | 5.8 | 0.6 | - |
| 2015 | 5.3 | 2.2 | - | 6.3 | 2.8 | - |
| 2020 | 3.9 | 2.3 | - | 4.9 | 2.1 | - |
| 2025 | 7.5 | 1.8 | - | 7.7 | 1.1 | - |

**Table 09-21.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2000 | 14 | 316 | 3 | 15 | 0.0 | 7.3 | 0.0 | 0.0 |
| 2005 | 195 | 261 | 185 | 27 | 0.4 | 8.3 | 1.3 | 0.1 |
| 2010 | 9 | 281 | 11 | 15 | 0.0 | 18.0 | 0.0 | 0.3 |
| 2015 | 402 | 330 | 246 | 68 | 9.0 | 16.7 | 1.6 | 0.6 |
| 2020 | 102 | 314 | 13 | 9 | 0.5 | 11.2 | 0.1 | 0.1 |
| 2025 | 78 | 336 | 66 | 23 | 0.5 | 22.2 | 0.2 | 0.2 |

**Table 09-21.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2000 | 54.7 | 1.5 | 12.5 | 31.1 | 0.3 | 25.9 |
| 2005 | 56.1 | 0.4 | 14.6 | 17.1 | 0.1 | 20.5 |
| 2010 | 49.5 | 1.5 | 25.0 | 13.1 | 0.0 | 24.3 |
| 2015 | 43.8 | 0.7 | 18.2 | 12.1 | 0.1 | 35.7 |
| 2020 | 43.2 | 1.5 | 23.9 | 22.4 | 0.1 | 19.1 |
| 2025 | 34.0 | 1.1 | 31.7 | 14.9 | 0.4 | 28.8 |

**Table 09-21.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 2000 | 7 | - | 28 | - | 5 |
| 2005 | 3 | - | 37 | 4 | 44 |
| 2010 | 3 | - | 40 | 2 | 9 |
| 2015 | 2 | - | 17 | 1 | 8 |
| 2020 | 6 | - | 35 | 3 | 8 |
| 2025 | 3 | - | 28 | 4 | 11 |
| Year | Days Use Per Acre (ha) | | | | |
| 2000 | - | - | 30.8 (76.1) | - | - |
| 2005 | 6.5 (16.1) | 8.7 (21.5)* | 58.3 (144.0) | 4.7 (11.6) | - |
| 2010 | 9.4 (23.3) | - | 71.7 (177.1) | 28.8 (71.2) | - |
| 2015 | 0.7 (1.8) | - | 7.4 (18.2) | - | - |
| 2020 | 14.5 (35.9) | 8.7 (21.5)* | 19.4 (48.0) | 3.4 (8.3) | - |
| 2025 | - | - | 16.8 (41.4) | 0.7 (1.7) | - |

*Pellets per acre (ha)

**Table 09-21.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 2000 | - | 11 | 21 | 302 | - | - | - | 20 | 3 |
| 2005 | 5 | - | 50 | 242 | - | - | - | 3 | 195 |
| 2010 | 4 | - | 31 | 254 | 18 | 22 | - | 4 | 9 |
| 2015 | 1 | 23 | 84 | 298 | 9 | - | - | 26 | 402 |
| 2020 | 3 | 74 | 19 | 296 | - | - | - | 22 | 46 |
| 2025 | 6 | 23 | 31 | 325 | - | - | 2 | 7 | 58 |
| year | Average Cover (%) | | | | | | | | |
| 2000 | - | 0.0 | 0.2 | 6.8 | - | - | - | 0.4 | 0.0 |
| 2005 | 0.1 | - | 1.8 | 6.4 | - | - | - | 0.0 | 0.4 |
| 2010 | 0.2 | - | 0.5 | 16.0 | 1.1 | 0.1 | - | 0.0 | 0.0 |
| 2015 | 0.0 | 0.1 | 1.1 | 15.3 | 0.1 | - | - | 0.1 | 8.9 |
| 2020 | 0.0 | 0.3 | 0.2 | 10.3 | - | - | - | 0.7 | 0.1 |
| 2025 | 0.4 | 0.4 | 0.3 | 21.2 | - | - | 0.0 | 0.3 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-21.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Hymenopappus filifolius (fineleaf hymenopappus) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Navarretia intertexta[a] (needleleaf navarretia) | Oenothera (evening primrose) | Phacelia ivesiana[a] (Ives' phacelia) | Salsola tragus[ai] (prickly Russian thistle) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 2000 | - | - | - | - | - | - | 3 | - | - | - | 8 | 7 |
| 2005 | - | - | 6 | - | 60 | 54 | 118 | - | - | 30 | 17 | 10 |
| 2010 | - | - | - | - | 4 | 2 | 2 | - | - | 3 | 15 | - |
| 2015 | 10 | 46 | 27 | 3 | 92 | 152 | 104 | 6 | - | - | 23 | 5 |
| 2020 | - | - | - | - | 0 | - | - | - | - | 13 | 9 | - |
| 2025 | - | - | 5 | - | 10 | 22 | - | - | 11 | 22 | 23 | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 2000 | - | - | - | - | - | - | 0.0 | - | - | - | 0.0 | 0.0 |
| 2005 | - | - | 0.0 | - | 0.3 | 0.3 | 0.6 | - | - | 0.1 | 0.1 | 0.0 |
| 2010 | - | - | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.3 | - |
| 2015 | 0.0 | 0.5 | 0.1 | 0.0 | 0.5 | 0.7 | 0.3 | 0.0 | - | - | 0.1 | 0.0 |
| 2020 | - | - | - | - | 0.0 | - | - | - | - | 0.1 | 0.1 | - |
| 2025 | - | - | 0.0 | - | 0.1 | 0.1 | - | - | 0.0 | 0.1 | 0.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-21.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 2000 | - | - | - | - | - |
| 2005 | 9.8 | 4.6 | - | 1.8 | 0.4 |
| 2010 | 4.1 | 1.7 | - | 0.4 | 0.2 |
| 2015 | 3.6 | 2.7 | - | 2.4 | 0.4 |
| 2020 | 2.5 | 2.4 | - | 1.4 | 0.7 |
| 2025 | 3.4 | 4.3 | - | 0.4 | 0.7 |
| year | Quadrat Cover (%) | | | | |
| 2000 | 9.2 | 1.3 | - | 7.1 | 0.2 |
| 2005 | 8.7 | 3.1 | - | 0.4 | 0.2 |
| 2010 | 5.3 | 1.3 | 0.0 | 0.3 | 0.5 |
| 2015 | 3.4 | 1.9 | - | 1.6 | 0.6 |
| 2020 | 2.3 | 1.7 | - | 1.7 | 0.6 |
| 2025 | 4.0 | 3.5 | - | 1.1 | 0.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-21.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2000 | 3740 | - | 7 | 64 | 29 | 51 | 10 | 12 | 26/58 |
| 2005 | 3420 | 40 | 6 | 60 | 33 | 26 | 28 | 19 | 39/73 |
| 2010 | 2980 | - | 3 | 41 | 56 | 9 | 66 | 61 | 24/57 |
| 2015 | 2340 | - | 4 | 50 | 45 | 38 | 30 | 49 | 21/49 |
| 2020 | 1800 | 20 | 11 | 39 | 50 | 20 | 38 | 50 | 21/49 |
| 2025 | 2040 | 260 | 14 | 56 | 30 | 35 | 17 | 31 | - / - |
| Atriplex confertifolia[p] -- (shadscale saltbush) | | | | | | | | | |
| 2000 | 1720 | 20 | 6 | 57 | 37 | 9 | 4 | 11 | 16/30 |
| 2005 | 1740 | 120 | 13 | 81 | 7 | 0 | 0 | 5 | 34/59 |
| 2010 | 1680 | - | 14 | 33 | 52 | 13 | 0 | 39 | 25/51 |
| 2015 | 1600 | - | 10 | 79 | 11 | 13 | 6 | 14 | 25/52 |
| 2020 | 1340 | - | 10 | 66 | 24 | 8 | 2 | 31 | 23/50 |
| 2025 | 1660 | 60 | 13 | 55 | 31 | 0 | 0 | 33 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2000 | 39460 | 160 | 2 | 92 | 5 | 0 | 0 | 12 | 10/14 |
| 2005 | 1360 | 100 | 0 | 100 | 0 | 0 | 0 | 0 | 22/30 |
| 2010 | 1440 | - | 26 | 74 | 0 | 0 | 0 | 0 | 16/19 |
| 2015 | 10120 | 200 | 24 | 76 | 0 | 0 | 0 | 0 | 16/16 |
| 2020 | 3220 | - | 4 | 62 | 34 | 0 | 1 | 39 | 15/18 |
| 2025 | 3320 | 20 | 13 | 87 | 0 | 0 | 0 | 1 | - / - |

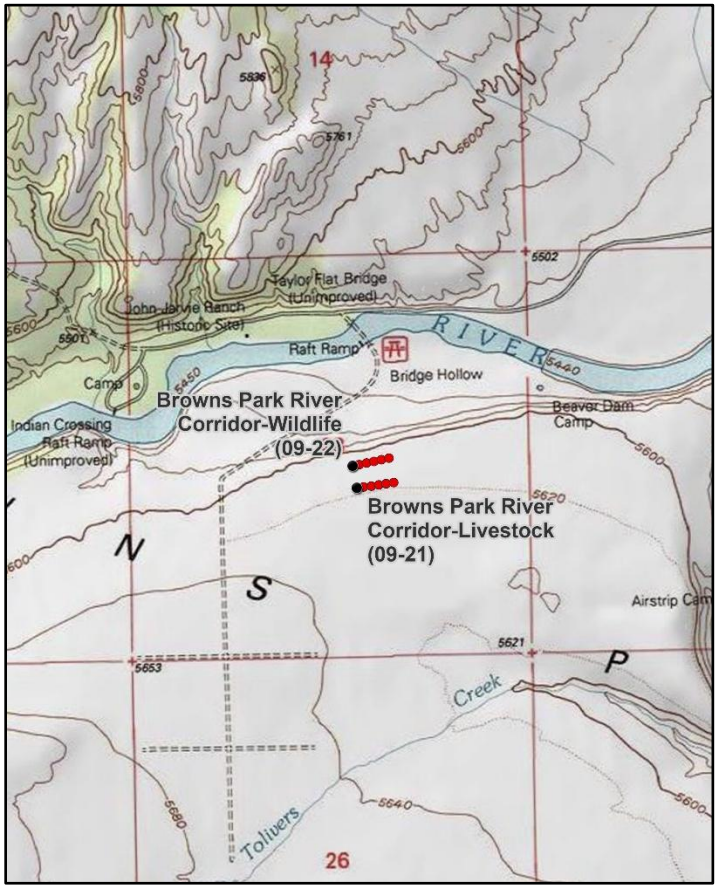
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 6/7 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2000 | 160 | - | 0 | 88 | 13 | 0 | 0 | 0 | 7/33 |
| 2005 | 220 | - | 0 | 91 | 9 | 0 | 0 | 0 | 10/37 |
| 2010 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/38 |
| 2015 | 380 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 13/38 |
| 2020 | 320 | - | 6 | 81 | 13 | 0 | 0 | 25 | 12/44 |
| 2025 | 380 | - | 0 | 95 | 5 | 0 | 0 | 5 | - / - |

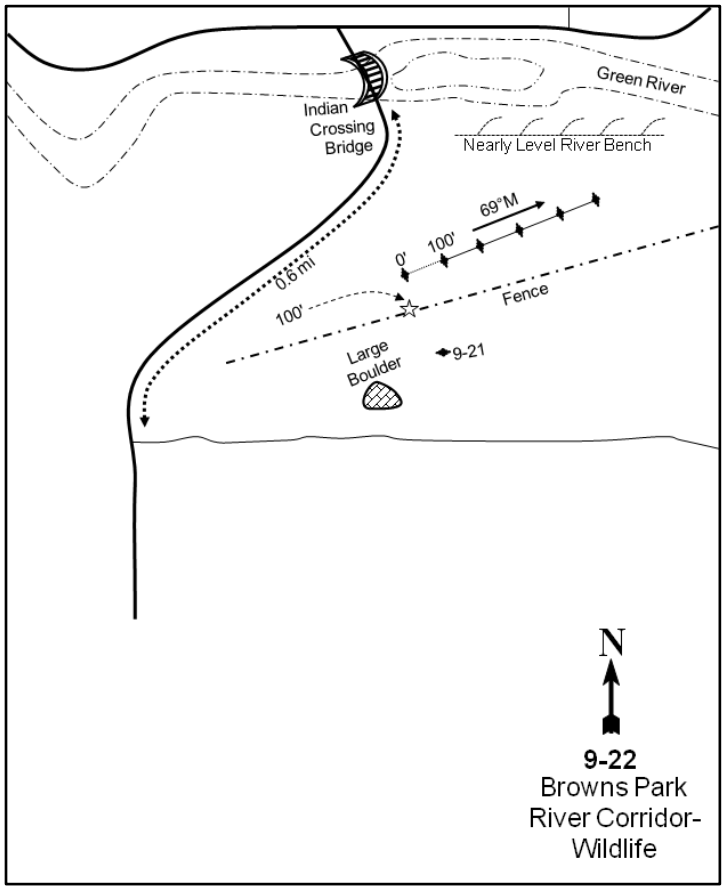
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-21.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2000 | 12.8 | 5.9 | 3.4 | 14.6 | 0.0 | 0.1 | 0.0 | **36.8** | Fair |
| 2005 | 16.9 | 7.5 | 4.2 | 16.6 | -0.3 | 0.3 | 0.0 | **45.2** | Fair-Good |
| 2010 | 6.8 | 1.2 | 3.3 | 30.0 | 0.0 | 0.6 | 0.0 | **41.9** | Fair |
| 2015 | 7.2 | 5.8 | 3.4 | 30.0 | -6.8 | 1.3 | 0.0 | **40.9** | Fair |
| 2020 | 5.5 | 0.0 | 0.0 | 22.4 | -0.4 | 0.2 | 0.0 | **27.7** | Fair |
| 2025 | 8.6 | 5.7 | 6.7 | 30.0 | -0.4 | 0.4 | 0.0 | **51.0** | Good |
| 2000 | 12.8 | 5.9 | 3.4 | 14.6 | 0.0 | 0.1 | 0.0 | **36.8** | Fair |

# BROWNS PARK RIVER CORRIDOR-WILDLIFE - STUDY NO. 09-22




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Clay Basin SE; Township 2N, Range 24E, Section 23 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 653953 East 4528650 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9146 |
| Transect Bearing | 69° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Belt 3: No Rebar |

## Directions to Site

Driving from Taylor Flat at Brown's Park, travel south for 0.6 miles to a fork. Turn left onto a small road and proceed for 0.3 miles. There is a large boulder on the north side of the road. From the boulder, walk north to the fence at a bearing of 0 degrees magnetic. From the fence, the 0-foot baseline stake is another 100 feet away and is marked by browse tag #9146.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | No data |
| Elevation | 5,600ft (1,707m) |
| Aspect | North |
| Slope | 2% |
| Sample Dates | 09/19/2000, 07/27/2005, 07/28/2010, 06/23/2015, 07/15/2020, 07/14/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-22.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |

**Table 09-22.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2000 | Mixed Shrub/Perennial Grass | No Encroachment |
| 2005 | Mixed Shrub/Perennial Grass | No Encroachment |
| 2010 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2015 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2020 | Perennial Grass | No Encroachment |
| 2025 | Perennial Grass | No Encroachment |

## Site Notes

The study was placed to monitor differences between livestock use and wildlife use on two sides of a fence line that was built in 1963. The fence was built to exclude cattle grazing on one side of the fence while allowing grazing on the other side. Wildlife are not excluded from either side of the fence line and the Brown's Park River Corridor-Livestock study (09-21) monitors the livestock side. This study samples the north side of the fence that is not accessible to livestock. The area is approximately one half mile south of the Green River in Brown's Park on a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and grass flat.

## Soils

**Table 09-22.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.8 | 59.6 | 23.1 | 17.3 | 0.7 | 3.9 | 150.4 | 0.5 | 09/19/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 8 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 2000-2015 - Current Potential State: Community Phase 2.1<br>2020-2025 - Current Potential State: Community Phase 2.5 |

From study establishment in 2000 through the 2015 sample year, the plant community on this site appeared to be in a transitional phase with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and the perennial grass species needle and thread (*Hesperostipa comata*) as the dominant species (Table 09-22.10, Table 09-22.12). Wyoming big sagebrush was sampled in moderate abundance at study establishment, but density and cover have decreased over the sample years (Table 09-22.12, Table 09-22.13). The herbaceous understory has remained abundant and moderately diverse, and perennial grasses have been the sole dominant vegetation component since 2020 (Table 09-22.10, Table 09-22.11).

Deer winter range condition has remained fair since 1995; condition stability can be attributed to persistent perennial grass cover. Improvement to deer wintering range could be achieved through efforts that increase preferred browse recruitment and cover, and perennial forb cover. Attention should be given to the gradual invasion of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-22.6, Table 09-22.7, Table 09-22.13, Table 09-22.15). Pellet transect data shows that deer and elk presence has varied widely over the sample period between low and moderate levels; both species had low presence in 2025 (Table 09-22.9).

## Trend Summary Tables

**Table 09-22.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2000 | 5.6 | 1.3 | - | - | - | - |
| 2005 | 11.6 | 0.7 | - | 16.4 | 0.6 | - |
| 2010 | 5.8 | 0.5 | - | 6.2 | 0.8 | - |
| 2015 | 3.9 | 1.6 | - | 4.2 | 0.9 | - |
| 2020 | 1.0 | 1.1 | - | 1.0 | 1.3 | - |
| 2025 | 3.2 | 1.6 | - | 2.8 | 1.4 | - |

**Table 09-22.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2000 | 12 | 336 | 5 | 1 | 0.1 | 19.4 | 0.0 | 0.0 |
| 2005 | 224 | 219 | 127 | 1 | 0.5 | 8.2 | 1.5 | 0.0 |
| 2010 | 69 | 262 | 78 | - | 0.2 | 18.4 | 0.4 | - |
| 2015 | 387 | 284 | 306 | 5 | 8.4 | 17.2 | 4.7 | 0.1 |
| 2020 | 186 | 280 | 26 | - | 1.7 | 21.2 | 0.1 | - |
| 2025 | 144 | 330 | 95 | - | 1.3 | 26.3 | 0.5 | - |

**Table 09-22.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2000 | 39.8 | 6.7 | 29.8 | 20.6 | 0.1 | 27.7 |
| 2005 | 50.1 | 1.6 | 19.7 | 16.7 | 0.1 | 20.6 |
| 2010 | 39.6 | 5.7 | 29.2 | 12.8 | 0.2 | 25.0 |
| 2015 | 38.1 | 2.5 | 26.2 | 8.7 | 0.5 | 36.5 |
| 2020 | 23.2 | 10.6 | 35.7 | 18.5 | 0.9 | 26.2 |
| 2025 | 21.8 | 13.0 | 31.6 | 13.2 | 0.5 | 30.1 |

**Table 09-22.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2000 | 24 | - | - | 9 |
| 2005 | 22 | - | - | 49 |
| 2010 | 44 | 2 | - | 21 |
| 2015 | 8 | - | - | 24 |
| 2020 | 38 | 3 | - | 15 |
| 2025 | 18 | 4 | - | 33 |
| Year | Days Use Per Acre (ha) | | | |
| 2000 | 39.6 (97.7) | - | 8.7 (21.5)* | - |
| 2005 | 29.5 (72.8) | 0.7 (1.7) | - | - |
| 2010 | 53.6 (132.4) | 26.2 (64.6) | - | - |
| 2015 | 7.4 (18.2) | - | - | - |
| 2020 | 40.9 (101.0) | 4.7 (11.6) | - | - |
| 2025 | 13.4 (33.1) | 0.7 (1.7) | - | - |

*Pellets per acre (ha)

**Table 09-22.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2000 | - | 8 | 42 | 324 | - | - | - | 4 |
| 2005 | 4 | - | 11 | 210 | 5 | - | 7 | 224 |
| 2010 | 10 | 7 | 14 | 250 | 13 | - | 4 | 64 |
| 2015 | - | 36 | 69 | 262 | 2 | - | 1 | 383 |
| 2020 | - | 185 | 58 | 252 | 8 | - | 3 | 11 |
| 2025 | 6 | 90 | 35 | 323 | - | 2 | - | 89 |
| year | Average Cover (%) | | | | | | | |
| 2000 | - | 0.0 | 0.8 | 18.6 | - | - | - | 0.0 |
| 2005 | 0.0 | - | 0.1 | 8.0 | 0.0 | - | 0.0 | 0.5 |
| 2010 | 0.3 | 0.0 | 0.5 | 17.6 | 0.1 | - | 0.0 | 0.2 |
| 2015 | - | 0.2 | 1.3 | 15.8 | 0.1 | - | 0.0 | 8.2 |
| 2020 | - | 1.7 | 1.6 | 19.5 | 0.1 | - | 0.0 | 0.0 |
| 2025 | 0.2 | 0.8 | 0.5 | 25.6 | - | 0.0 | - | 0.6 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-22.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Artemisia dracunculus (tarragon) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Navarretia intertexta[a] (needleleaf navarretia) | Oenothera pallida[a] (pale evening primrose) | Phacelia ivesiana[a] (Ives' phacelia) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 2000 | - | - | 5 | - | - | - | - | - | - | - | - | 1 |
| 2005 | - | 1 | 21 | 1 | 37 | 14 | 77 | - | - | 10 | - | - |
| 2010 | - | - | 1 | 2 | 62 | 2 | 21 | - | - | - | - | - |
| 2015 | 1 | 4 | 38 | - | 290 | 64 | 48 | 14 | - | 6 | 4 | - |
| 2020 | - | - | 6 | - | 20 | - | - | - | - | - | - | - |
| 2025 | - | - | 2 | - | 26 | 18 | - | - | 6 | 54 | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 2000 | - | - | 0.0 | - | - | - | - | - | - | - | - | 0.0 |
| 2005 | - | 0.0 | 0.3 | 0.0 | 0.3 | 0.1 | 0.6 | - | - | 0.0 | - | - |
| 2010 | - | - | 0.0 | 0.0 | 0.3 | 0.0 | 0.1 | - | - | - | - | - |
| 2015 | 0.0 | 0.0 | 0.2 | - | 3.2 | 1.1 | 0.2 | 0.0 | - | 0.0 | 0.0 | - |
| 2020 | - | - | 0.0 | - | 0.0 | - | - | - | - | - | - | - |
| 2025 | - | - | 0.0 | - | 0.2 | 0.1 | - | - | 0.0 | 0.3 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-22.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 2000 | - | - | - | - |
| 2005 | 2.6 | 13.8 | - | 0.6 |
| 2010 | 1.6 | 4.6 | 0.1 | 0.7 |
| 2015 | - | 4.2 | 0.2 | 0.7 |
| 2020 | - | 1 | - | 1.3 |
| 2025 | - | 2.8 | 0.1 | 1.3 |
| year | Quadrat Cover (%) | | | |
| 2000 | 3.4 | 2.3 | 0.7 | 0.6 |
| 2005 | 2.0 | 9.6 | 0.0 | 0.7 |
| 2010 | 1.2 | 4.6 | 0.2 | 0.4 |
| 2015 | 0.0 | 3.9 | 0.7 | 0.9 |
| 2020 | - | 1.0 | - | 1.1 |
| 2025 | - | 3.2 | 0.0 | 1.5 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-22.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2000 | 2240 | - | 1 | 53 | 46 | 16 | 2 | 32 | 28/56 |
| 2005 | 1280 | 360 | 0 | 42 | 58 | 33 | 13 | 55 | 39/71 |
| 2010 | 1260 | - | 6 | 33 | 60 | 35 | 38 | 62 | 29/61 |
| 2015 | 200 | - | 10 | 50 | 40 | 11 | 0 | 44 | 28/58 |
| 2020 | 120 | - | 17 | 0 | 83 | 0 | 0 | 83 | 33/63 |
| 2025 | - | - | - | - | - | - | - | - | - / - |
| Atriplex confertifolia[p] -- (shadscale saltbush) | | | | | | | | | |
| 2000 | 2340 | - | 2 | 62 | 36 | 3 | 0 | 15 | 19/37 |
| 2005 | 2260 | - | 1 | 90 | 9 | 0 | 0 | 4 | 40/76 |
| 2010 | 1900 | 140 | 2 | 47 | 51 | 21 | 2 | 61 | 30/61 |
| 2015 | 1860 | - | 15 | 62 | 23 | 11 | 0 | 29 | 32/55 |
| 2020 | 700 | 20 | 6 | 23 | 71 | 31 | 0 | 71 | 34/56 |
| 2025 | 1120 | 140 | 20 | 68 | 13 | 0 | 0 | 18 | - / - |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 25/56 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

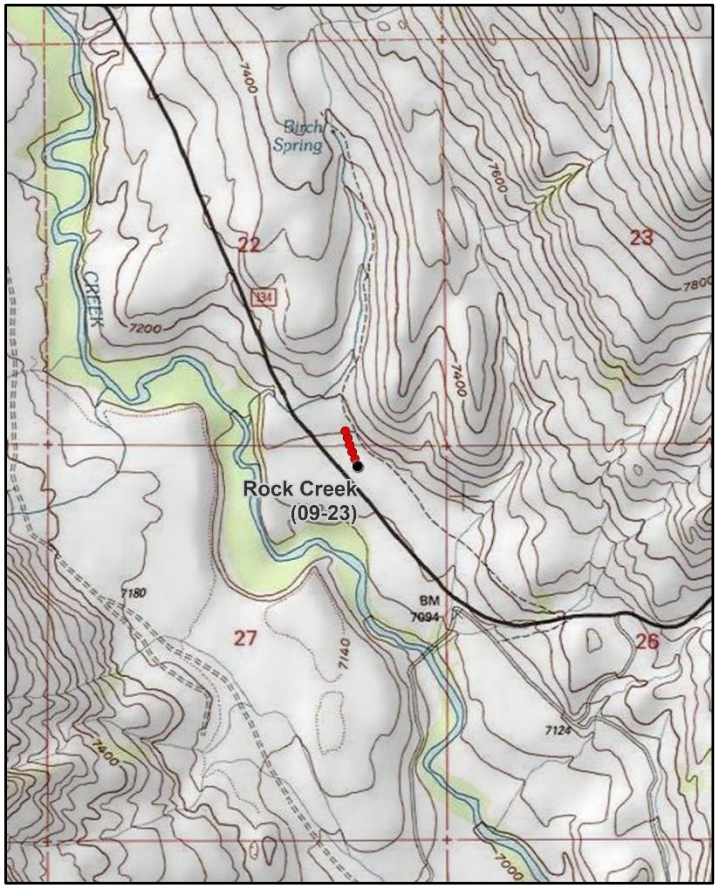
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2000 | 1740 | - | 0 | 36 | 64 | 0 | 1 | 81 | 14/19 |
| 2005 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 26/29 |
| 2010 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/26 |
| 2015 | 1340 | - | 3 | 97 | 0 | 0 | 0 | 0 | 19/18 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | 16/23 |
| 2025 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2000 | 260 | - | 0 | 92 | 8 | 0 | 0 | 8 | 8/32 |
| 2005 | 360 | - | 11 | 78 | 11 | 0 | 0 | 6 | 10/41 |
| 2010 | 320 | - | 0 | 94 | 6 | 0 | 0 | 6 | 13/43 |
| 2015 | 500 | - | 0 | 100 | 0 | 0 | 0 | 4 | 14/44 |
| 2020 | 340 | - | 0 | 82 | 18 | 0 | 0 | 29 | 14/57 |
| 2025 | 520 | - | 0 | 69 | 31 | 0 | 0 | 27 | - / - |

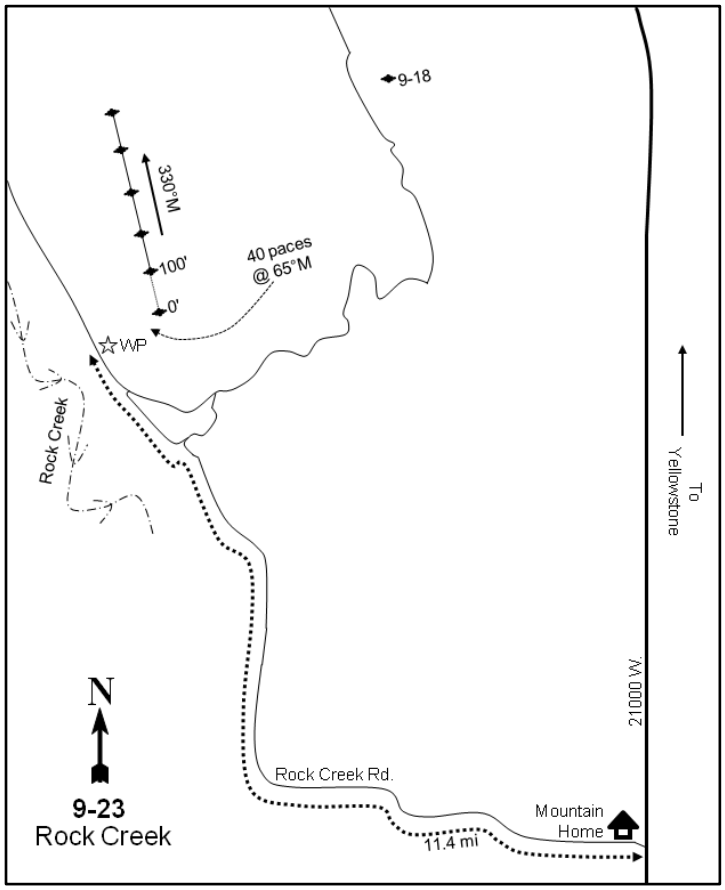
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-22.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2000 | 6.5 | 2.4 | 0.6 | 30.0 | -0.1 | 0.0 | 0.0 | **39.4** | Fair |
| 2005 | 17.1 | 10.0 | 0.4 | 16.3 | -0.4 | 0.0 | 0.0 | **43.4** | Fair-Good |
| 2010 | 6.6 | -0.9 | 1.6 | 30.0 | -0.2 | 0.0 | 0.0 | **37.1** | Fair |
| 2015 | 4.2 | 0.0 | 0.0 | 30.0 | -6.3 | 0.1 | 0.0 | **28.0** | Fair |
| 2020 | 1.0 | 0.0 | 0.0 | 30.0 | -1.3 | 0.0 | 0.0 | **29.7** | Fair |
| 2025 | 2.8 | 0.0 | 0.0 | 30.0 | -1.0 | 0.0 | 0.0 | **31.8** | Fair |

# ROCK CREEK - STUDY NO. 09-23




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Dry Mountain NE; Township 1N, Range 6W, Section 27 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 538384 East 4478840 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9172 |
| Transect Bearing | 330° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Belt 4: 2ft |

## Directions to Site

From the corner store in Mountain Home (21000 West and 6750 North), travel 11.4 miles northwest toward Rock Creek. The witness post is on the right (east) side of the road. From the witness post, walk 40 paces at 65 degrees magnetic to the 0-foot stake, which is marked with browse tag #9172.

## Site Information

| | |
|---|---|
| Land Ownership | Tribal |
| Land Administrator | Tribal |
| Allotment | No data |
| Elevation | 7,140ft (2,176m) |
| Aspect | Southeast |
| Slope | 6% |
| Sample Dates | 07/08/2005, 07/12/2010, 06/30/2015, 08/12/2020, 07/29/2025 |

## Wildlife Habitat and Vegetation History

**Table 09-23.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Shiras Moose | crucial | year-long |

**Table 09-23.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

The area is on the border between crucial winter and crucial summer range for both deer and elk and is likely used during both seasons. The area may be inaccessible to wildlife in more severe winters.

## Soils

**Table 09-23.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.5 | 55.1 | 31.1 | 13.8 | 1.8 | 14.4 | 147.2 | 0.4 | 07/08/2005 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC430UT |
| States and Transitions | 2005-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 2005, the plant community on this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant species (Table 09-23.12, Table 09-23.13). The herbaceous understory has remained diverse and abundant over the sample years, with perennial grasses such as needle and thread (*Hesperostipa comata*) contributing a majority of the cover. The weedy and introduced annual grass species cheatgrass (*Bromus tectorum*) has been present in fluctuating amounts, but both cover and abundance were very low in 2025. Forbs have been rare in most sample years (Table 09-23.7, Table 09-23.10, Table 09-23.11). Rocky Mountain juniper (*Juniperus scopulorum*) and Utah juniper (*J. osteosperma*) encroachment is occurring in the area, but density and cover have remained low for these species; the site has been considered to be within Early Phase I of woodland succession throughout the study period (Table 09-23.4, Table 09-23.12, Table 09-23.14).

Deer winter range condition has improved slightly from fair to good. The increase in condition quality can be attributed to the increase in preferred browse recruitment and perennial grass cover, and a decrease in annual grass cover. In 2025, deer winter range condition was considered to be good. Further improvement to deer wintering range could be achieved through efforts that increase perennial forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-23.7, Table 09-23.13, Table 09-23.15). Pellet transect data shows that deer and elk presence has varied widely over the sample years, but presence has generally been more pronounced for the mule deer population (Table 09-23.9). During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife Migration Initiative). More than 60% of mountain big sagebrush plants sampled in density strips were moderately to heavily hedged between 2005 and 2020, but only 33% displayed that level of utilization in 2025. Although utilization and density trends are likely multifactorial, the recent decrease in utilization between 2020 and 2025 correlates with an increase in mountain big sagebrush density over the same period (Table 09-23.13).

## Trend Summary Tables

**Table 09-23.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2005 | 21.4 | 2.6 | - | 29.3 | 2.0 | - |
| 2010 | 22.4 | 0.5 | - | 29.8 | 0.8 | - |
| 2015 | 21.3 | 0.6 | 0.9 | 29.5 | 0.9 | 1.0 |
| 2020 | 27.8 | 2.3 | - | 29.6 | 1.9 | 0.9 |
| 2025 | 23.0 | 3.4 | 0.1 | 26.4 | 3.4 | 1.0 |

**Table 09-23.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2005 | 241 | 315 | 232 | 94 | 4.1 | 12.0 | 1.2 | 1.5 |
| 2010 | 40 | 327 | 74 | 70 | 0.1 | 12.7 | 0.3 | 0.7 |
| 2015 | 281 | 344 | 251 | 82 | 7.4 | 20.1 | 7.6 | 0.7 |
| 2020 | 198 | 301 | 170 | 33 | 3.7 | 17.6 | 1.0 | 0.2 |
| 2025 | 37 | 319 | 21 | 32 | 0.2 | 17.5 | 0.1 | 0.9 |

**Table 09-23.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2005 | 38.1 | 3.4 | 36.3 | 0.5 | 2.6 | 35.3 |
| 2010 | 27.9 | 1.3 | 47.1 | 1.2 | 3.3 | 37.9 |
| 2015 | 30.4 | 1.2 | 46.2 | 0.8 | 2.6 | 45.9 |
| 2020 | 26.8 | 1.8 | 45.3 | 1.2 | 3.3 | 43.9 |
| 2025 | 25.3 | 1.1 | 45.3 | 1.5 | 3.5 | 39.4 |

**Table 09-23.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2005 | - | 51 | 7 | 45 |
| 2010 | 1 | 23 | 3 | 23 |
| 2015 | 1 | 23 | 4 | 35 |
| 2020 | - | 26 | 12 | 28 |
| 2025 | - | 32 | 18 | 22 |
| Year | Days Use Per Acre (ha) | | | |
| 2005 | - | 61.7 (152.3) | 22.1 (54.6) | - |
| 2010 | 7.2 (17.9) | 35.5 (87.7) | 8.7 (21.5) | - |
| 2015 | - | 44.2 (109.2) | 14.1 (34.8) | - |
| 2020 | - | 81.1 (200.3) | 9.4 (23.2) | - |
| 2025 | - | 27.5 (67.9) | 33.5 (82.8) | - |

**Table 09-23.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2005 | 5 | 1 | - | 3 | 154 | 31 | 81 | 73 | 138 | 2 | - | 7 | - | 157 | 5 | - | 146 |
| 2010 | 7 | 5 | 4 | 6 | 35 | 86 | 57 | 58 | 179 | 7 | - | 76 | - | 116 | 6 | - | 5 |
| 2015 | 6 | - | - | 11 | 111 | 92 | 81 | 94 | 189 | - | - | 35 | - | 131 | 6 | - | 244 |
| 2020 | 19 | - | 13 | 5 | 143 | 57 | 69 | 34 | 185 | 5 | 4 | 11 | - | 83 | 15 | 1 | 92 |
| 2025 | 3 | 10 | 4 | 9 | 11 | 87 | 27 | 91 | 188 | - | - | 15 | 2 | 60 | - | 15 | 33 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2005 | 0.2 | 0.1 | - | 0.0 | 3.6 | 0.2 | 2.0 | 0.7 | 6.0 | 0.0 | - | 0.3 | - | 2.5 | 0.0 | - | 0.5 |
| 2010 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.9 | 1.4 | 0.5 | 7.0 | 0.4 | - | 1.3 | - | 0.8 | 0.0 | - | 0.0 |
| 2015 | 0.3 | - | - | 0.0 | 3.3 | 1.2 | 4.3 | 1.9 | 9.3 | - | - | 0.6 | - | 1.8 | 0.7 | - | 4.2 |
| 2020 | 1.3 | - | 0.8 | 0.2 | 3.2 | 0.5 | 2.6 | 0.3 | 8.6 | 0.1 | 0.1 | 0.6 | - | 1.6 | 0.8 | 0.0 | 0.4 |
| 2025 | 0.0 | 0.2 | 0.2 | 0.4 | 0.0 | 2.0 | 0.7 | 1.6 | 10.7 | - | - | 0.5 | 0.0 | 0.7 | - | 0.5 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-23.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium (onion) | Arabis (rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Cordylanthus[a] (bird's-beak) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2005 | 51 | - | 2 | 3 | 2 | - | - | - | - | 7 | 17 | 2 | - | 5 | 1 | 6 | 11 |
| 2010 | 18 | - | 3 | 1 | - | - | 4 | 4 | - | - | 18 | - | - | 1 | - | - | - |
| 2015 | 12 | 3 | - | 11 | - | - | - | - | - | 3 | 23 | - | - | 9 | - | 41 | 29 |
| 2020 | 11 | - | 4 | - | - | 3 | - | - | 7 | 5 | 6 | - | - | 3 | - | 6 | 15 |
| 2025 | 1 | 1 | - | 3 | - | - | - | - | - | 5 | 15 | - | 1 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2005 | 0.3 | - | 0.0 | 0.2 | 0.0 | - | - | - | - | 0.0 | 0.7 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 |
| 2010 | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | - | 0.3 | - | - | 0.0 | - | - | - |
| 2015 | 0.0 | 0.0 | - | 0.2 | - | - | - | - | - | 0.0 | 0.1 | - | - | 0.1 | - | 0.9 | 0.1 |
| 2020 | 0.1 | - | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.1 | 0.0 |
| 2025 | 0.0 | 0.0 | - | 0.0 | - | - | - | - | - | 0.0 | 0.6 | - | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gilia inconspicua[a] (shy gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Machaeranthera grindelioides (rayless tansyaster) | Microsteris gracilis[a] (slender phlox) | Penstemon watsonii (Watson's penstemon) | Plantago patagonica[a] (woolly plantain) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Verbascum thapsus[ai] (common mullein) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 2005 | - | 7 | 36 | 71 | 9 | - | 1 | 22 | 7 | 128 | 78 | 3 | 12 | - | - |
| 2010 | - | 5 | 3 | 1 | 7 | - | 9 | 27 | - | 30 | 15 | 9 | 18 | - | - |
| 2015 | 1 | 5 | - | 3 | 44 | 25 | - | - | 1 | 210 | 3 | 5 | 16 | 6 | - |
| 2020 | - | 5 | 6 | 7 | 23 | 7 | 2 | 13 | - | 40 | 108 | - | 4 | - | - |
| 2025 | - | 6 | 7 | 1 | 3 | 2 | - | - | - | 9 | - | 5 | 2 | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 2005 | - | 0.1 | 0.1 | 0.3 | 0.0 | - | 0.0 | 0.1 | 0.1 | 0.4 | 0.2 | 0.0 | 0.1 | - | - |
| 2010 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 | - | 0.1 | 0.1 | 0.0 | 0.1 | - | - |
| 2015 | 0.0 | 0.2 | - | 0.0 | 0.7 | 0.1 | - | - | 0.0 | 5.9 | 0.0 | 0.0 | 0.1 | 0.0 | - |
| 2020 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.5 | - | 0.0 | - | - |
| 2025 | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-23.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Eriogonum corymbosum (crispleaf buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia fragilis (brittle pricklypear) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 2005 | 26.9 | - | - | 0.1 | 1.3 | - | 0.6 | 2.4 |
| 2010 | 27.2 | - | 0.1 | - | 0.1 | - | 0.6 | 2.6 |
| 2015 | 27.4 | - | - | - | 0.5 | 1 | 0.4 | 2.1 |
| 2020 | 26.1 | 0.5 | - | - | 1.2 | 0.9 | 0.2 | 3.5 |
| 2025 | 23.6 | - | - | - | 3 | 1 | 0.4 | 2.8 |
| year | Quadrat Cover (%) | | | | | | | |
| 2005 | 20.3 | - | 0.1 | 0.0 | 1.8 | - | 0.6 | 1.1 |
| 2010 | 20.5 | - | 0.0 | - | 0.0 | - | 0.4 | 1.9 |
| 2015 | 19.6 | - | 0.0 | - | 0.3 | 0.9 | 0.3 | 1.7 |
| 2020 | 24.4 | 0.0 | 0.1 | - | 1.9 | 0.0 | 0.2 | 3.4 |
| 2025 | 21.6 | 0.0 | - | - | 2.5 | 0.1 | 0.9 | 1.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-23.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2005 | 3960 | 2820 | 3 | 65 | 32 | 26 | 41 | 20 | 58/91 |
| 2010 | 4480 | 240 | 13 | 60 | 27 | 27 | 46 | 38 | 59/94 |
| 2015 | 4100 | 20 | 6 | 63 | 31 | 34 | 48 | 28 | 54/85 |
| 2020 | 3640 | 20 | 3 | 59 | 39 | 25 | 43 | 42 | 59/99 |
| 2025 | 4860 | 1420 | 21 | 46 | 34 | 28 | 5 | 37 | - / - |
| Atriplex confertifolia[p] -- (shadscale saltbush) | | | | | | | | | |
| 2005 | 100 | - | 20 | 80 | 0 | 80 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | 28/21 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 20/31 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 2005 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 44/97 |
| 2010 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 64/60 |
| 2015 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 79/108 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 56/62 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2005 | 1700 | - | 1 | 97 | 2 | 0 | 0 | 1 | 22/26 |
| 2010 | 320 | - | 19 | 81 | 0 | 0 | 0 | 0 | 21/23 |
| 2015 | 460 | 160 | 4 | 96 | 0 | 0 | 0 | 0 | 25/26 |
| 2020 | 1980 | - | 1 | 99 | 0 | 0 | 0 | 0 | 21/22 |
| 2025 | 7580 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 32/37 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 2005 | 1540 | - | 1 | 97 | 1 | 0 | 0 | 0 | 6/15 |
| 2010 | 1180 | 160 | 7 | 93 | 0 | 0 | 0 | 0 | 5/20 |
| 2015 | 1400 | 40 | 7 | 93 | 0 | 0 | 0 | 0 | 6/16 |
| 2020 | 780 | - | 3 | 97 | 0 | 0 | 0 | 3 | 5/12 |
| 2025 | 1080 | - | 6 | 39 | 56 | 0 | 0 | 56 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | 7/9 |
| 2010 | - | - | - | - | - | - | - | - | 12/13 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/7 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2005 | 420 | - | 14 | 57 | 29 | 29 | 62 | 14 | 44/93 |
| 2010 | 500 | - | 4 | 96 | 0 | 8 | 64 | 0 | 41/84 |
| 2015 | 420 | - | 10 | 91 | 0 | 57 | 29 | 0 | 40/96 |
| 2020 | 400 | 40 | 0 | 95 | 5 | 10 | 35 | 5 | 52/121 |
| 2025 | 580 | - | 0 | 93 | 7 | 41 | 52 | 10 | - / - |
| Sambucus[p] -- (elderberry) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 29/24 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

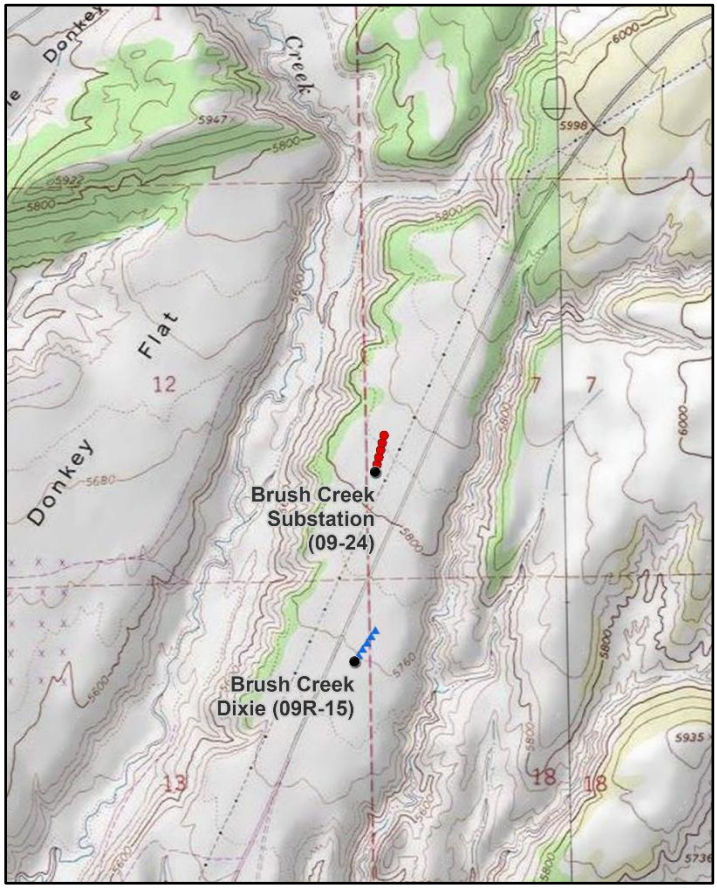
**Table 09-23.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

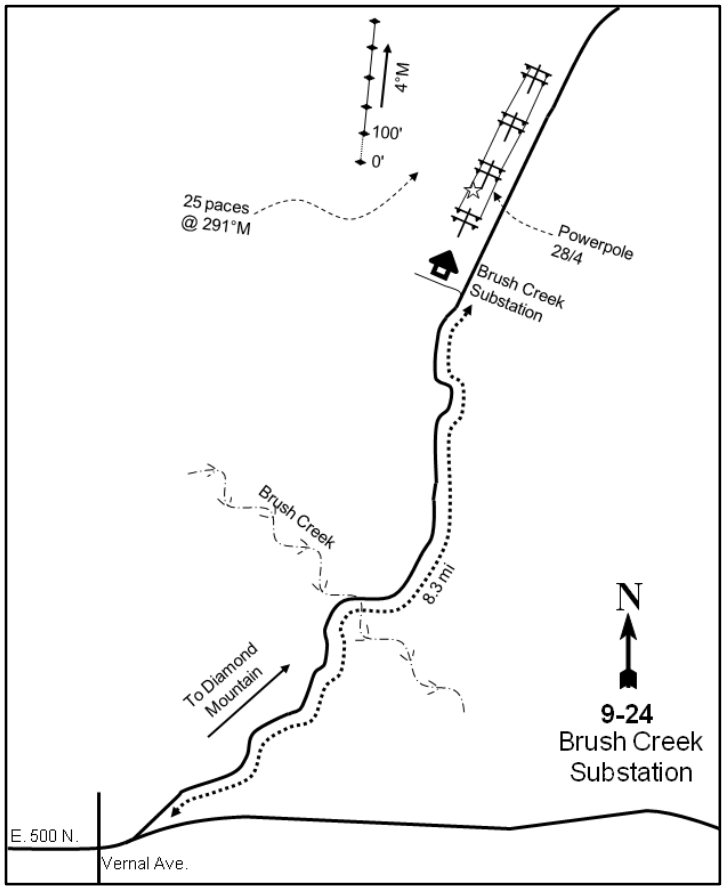
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 9 | - | 29 | - | 14 | 57 | 17.4 |
| 2020 | 13 | - | 44 | 11 | 22 | 22 | 9.9 |
| 2025 | 15 | - | 55 | 9 | 18 | 18 | 11.3 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2015 | 2 | - | - | 50 | 50 | - | 22.0 |
| 2020 | 2 | - | - | 50 | 50 | - | 17.5 |
| 2025 | 2 | - | - | - | 100 | - | 20.5 |

**Table 09-23.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | 30.0 | 5.4 | 1.7 | 24.1 | -3.0 | 3.1 | 0.0 | **61.3** | Fair |
| 2010 | 30.0 | 7.5 | 5.9 | 25.3 | -0.1 | 1.4 | 0.0 | **70.0** | Fair-Good |
| 2015 | 30.0 | 6.5 | 3.1 | 30.0 | -5.6 | 1.5 | 0.0 | **65.5** | Fair |
| 2020 | 30.0 | 4.6 | 1.2 | 30.0 | -2.7 | 0.3 | 0.0 | **63.4** | Fair |
| 2025 | 30.0 | 5.8 | 9.2 | 30.0 | -0.1 | 1.7 | 0.0 | **76.6** | Good |

# BRUSH CREEK SUBSTATION - STUDY NO. 09-24




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Donkey Flat NE; Township 3S, Range 23E, Section 07 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 636733 East 4492292 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 61 |
| Transect Bearing | 4° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

Driving from the intersection of Vernal Avenue and 500 North in Vernal, travel east on 500 North. Turn north on the road that leads to Diamond Mountain. Drive 8.3 miles to a short road on the left that leads to the Brush Creek Substation. Turn north and follow the power lines to the second set of power poles and to power pole #28/4. From the westernmost pole, walk 25 paces at 291 degrees magnetic to the 0-foot stake, which is marked with browse tag number #61.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | S.J. HATCH |
| Elevation | 5,845ft (1,782m) |
| Aspect | South |
| Slope | 2% |
| Sample Dates | 07/10/1997, 07/14/2005, 07/27/2010, 07/06/2015, 08/05/2021, 07/21/2025 |

**Table 09-24.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Rangeland Drill | Brush Creek Bench Seeding | 1659 | October 2010 | 408 |
| Herbicide - Imazapic | Brush Creek Bench Sage Restoration | 315 | September 2008 | 279 |
| Seeding - Aerial After | Brush Creek Bench Sage Restoration | 315 | March 2009 | 279 |
| Harrow - One-Way Dixie | Brush Creek Bench Sage Restoration | 315 | December 2008 | 279 |
| Seeding - Broadcast Before | Brush Creek Bench Sage Restoration | 315 | December 2008 | 279 |

**Table 09-24.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Brush Creek Bench Sage Restoration | | | Broadcast | Dec 2008 | 300 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | Douglas | 1.50 | 1.23 |
| G | Agropyron desertorum | Crested Wheatgrass | Hycrest | 1.00 | 0.91 |
| G | Elymus lanceolatus | Thickspike Wheatgrass | Critana | 1.00 | 0.87 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Secar | 1.00 | 0.76 |
| G | Poa secunda | Sandberg Bluegrass | Toole MT | 0.50 | 0.42 |
| G | Psathyrostachys juncea | Russian Wildrye | Bozoisky | 1.00 | 0.85 |
| F | Medicago sativa | Alfalfa | Ladak | 2.00 | 1.81 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Brush Creek Bench - Sagebrush/Kochia | | | Aerial | Mar 2009 | 300 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Sanpete UT | 1.00 | 0.19 |
| S | Bassia prostrata | Forage Kochia | Lander NV | 1.00 | 0.66 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Brush Creek Bench Seeding | | | Drill | Oct 2010 | 410 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | Ephraim | 0.98 | 0.92 |
| G | Agropyron cristatum | Crested Wheatgrass | Nordan | 0.98 | 0.82 |
| G | Agropyron fragile | Siberian Wheatgrass | Vavilov (NC) | 0.49 | 0.38 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Secar | 1.10 | 0.87 |
| G | Pascopyrum smithii | Western Wheatgrass | Arriba | 1.10 | 0.94 |
| G | Poa secunda | Sandberg Bluegrass | UP/Colorado Plateau | 0.49 | 0.45 |
| G | Psathyrostachys juncea | Russian Wildrye | Bozoisky | 0.98 | 0.79 |
| F | Linum perenne | Blue Flax | Appar | 0.98 | 0.87 |
| F | Medicago sativa | Alfalfa | Ladak + | 0.49 | 0.46 |
| F | Medicago sativa | Alfalfa | Ranger | 0.49 | 0.46 |
| F | Medicago sativa | Alfalfa | Spredor 4 | 0.49 | 0.43 |
| F | Sanguisorba minor | Small Burnet | Delar | 0.98 | 0.92 |
| S | Atriplex canescens | Fourwing Saltbush | Grand UT | 0.16 | 0.06 |
| S | Atriplex canescens | Fourwing Saltbush | Emery/Grand UT | 0.85 | 0.33 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Brush Creek Bench Seeding - Browse | | | Drill | Oct 2010 | 410 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Sanpete UT | 0.98 | 0.14 |
| S | Bassia prostrata | Forage Kochia | Sanpete UT | 0.73 | 0.37 |

## Wildlife Habitat and Vegetation History

**Table 09-24.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | year-long |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |

**Table 09-24.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Wyoming Big Sagebrush | No Encroachment |
| 2005 | Annual-Perennial Forb/Wyoming Big Sagebrush | No Encroachment |
| 2010 | Annual-Perennial Weed/Wyoming Big Sagebrush | No Encroachment |
| 2015 | Annual-Perennial Weed/Wyoming Big Sagebrush | No Encroachment |
| 2021 | Annual-Perennial Weed/Wyoming Big Sagebrush | Early Phase I |
| 2025 | Annual Weed/Wyoming Big Sagebrush | Early Phase I |

## Site Notes

The area to the east of the site was treated with the herbicide imazapic, a Dixie harrow, and aerial seeding as part of the Brush Creek Bench Sage Restoration in the fall of 2008. It appears that the last belt of the transect may have been affected by the treatment.

## Soils

**Table 09-24.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.8 | 57.3 | 22.1 | 20.6 | 1.4 | 8.4 | 67.2 | 0.4 | 07/10/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1997 - Current Potential State: Community Phase 2.1<br>2005-2025 - Current Potential State: Community Phase Undefined |

When the study was established in 1997, the plant community on this site was dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (Photos, Table 09-24.12). The herbaceous understory was in poor condition with cheatgrass (*Bromus tectorum*) as the dominant species (Table 09-24.10). After 1997, sagebrush decreased substantially (Table 09-24.13), which could possibly be attributed to the drought in 2002-2003. In 2005, the site transitioned to a perennial-annual forb/annual grass community (Table 09-24.7) with sagebrush scattered across the area. In 2008, a herbicide, Dixie harrow, and seeding project occurred. An additional rangeland drill seeding occurred in 2010 due to the low success of the 2008 seeding (Table 09-24.1). Following the treatments, the site has remained in poor condition as an annual grass/forb community (Table 09-24.7, Table 09-24.10, Table 09-24.11). Sagebrush has also remained in poor condition, providing little cover while decadence and poor vigor increased between 2010 and 2021. However, sagebrush cover and density increased between 2021 and 2025 while decadence decreased, suggesting that sagebrush may have the potential to increase in dominance over time (Table 09-24.12, Table 09-24.13).

Deer winter range condition has varied over the sample period, but has improved slightly from fair to fair-good since 1997. In 2025, deer winter range condition was considered to be fair-good; the improvement in condition quality can be attributed to increased preferred browse recruitment and cover. However, perennial grass cover has remained low while that of perennial forbs decreased in 2025. Further improvement to deer wintering range can been achieved through efforts that increase preferred browse, and perennial grass and forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-24.6, Table 09-24.7, Table 09-24.13, Table 09-24.15). Pellet transect data shows that deer presence has remained moderate over the sample period. During the 2024/25 winter season the area had occurrences of collared mule deer, but at low densities (Wildlife Migration Initiative); this suggests that the area is used more for migration than for home range. Utilization of Wyoming big sagebrush has been heavy in many years. However, only 41% of plants sampled in density strips were moderately to heavily utilized in 2025 (compared with 70% in 2021). This decrease in utilization between the two most recent sample years correlates with both a decrease in deer presence and an increase in sagebrush density (Table 09-24.9, Table 09-24.13).

## Trend Summary Tables

**Table 09-24.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 16.0 | 0.0 | - | - | - | - |
| 2005 | 2.4 | 0.3 | - | 3.4 | - | - |
| 2010 | 2.5 | 0.3 | - | 4.4 | - | - |
| 2015 | 1.4 | 0.5 | - | 2.1 | 0.1 | - |
| 2021 | 3.8 | 1.4 | - | 3.8 | 1.2 | - |
| 2025 | 7.3 | 1.2 | - | 7.8 | 1.6 | - |

**Table 09-24.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | 292 | 146 | 29 | 109 | 3.5 | 1.0 | 0.1 | 0.5 |
| 2005 | 139 | 30 | 341 | 288 | 3.5 | 0.5 | 11.9 | 21.7 |
| 2010 | 346 | 16 | 303 | 187 | 5.1 | 0.3 | 18.1 | 6.0 |
| 2015 | 471 | 67 | 353 | 304 | 16.5 | 3.0 | 8.2 | 6.6 |
| 2021 | 156 | 98 | 94 | 243 | 1.0 | 1.9 | 5.9 | 5.0 |
| 2025 | 267 | 80 | 163 | 147 | 1.7 | 1.4 | 4.5 | 1.1 |

**Table 09-24.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 44.4 | 5.0 | 22.5 | 4.3 | 0.5 | 18.6 |
| 2005 | 38.3 | 1.1 | 33.6 | 1.8 | 0.4 | 35.0 |
| 2010 | 41.0 | 0.3 | 31.7 | 2.6 | 0.1 | 33.1 |
| 2015 | 20.3 | - | 55.1 | 1.5 | 0.2 | 36.6 |
| 2021 | 34.3 | 1.2 | 41.4 | 2.0 | 0.4 | 19.3 |
| 2025 | 36.3 | - | 55.5 | 3.8 | 0.2 | 16.0 |

**Table 09-24.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1997 | - | 61 | 16 | 9 |
| 2005 | - | 46 | 1 | 26 |
| 2010 | 8 | 24 | 1 | 6 |
| 2015 | 10 | 45 | - | 8 |
| 2021 | 14 | 43 | 5 | 30 |
| 2025 | 14 | 30 | - | 26 |
| Year | Days Use Per Acre (ha) | | | |
| 1997 | - | - | - | - |
| 2005 | 5.8 (14.3) | 44.9 (110.9) | 0.7 (1.7) | - |
| 2010 | 6.5 (16.1) | 20.8 (51.3) | 0.7 (1.7) | - |
| 2015 | 10.2 (25.1) | 40.2 (99.3) | - | - |
| 2021 | 13.1 (32.3) | 44.2 (109.2) | 5.3 (13.2) | - |
| 2025 | 43.6 (107.6) | 33.5 (82.8) | 0.7 (1.7) | - |

**Table 09-24.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Sporobolus cryptandrus (sand dropseed) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1997 | - | - | 292 | 146 | - | 3 | - | - | - |
| 2005 | 5 | - | 139 | 23 | - | 3 | - | - | - |
| 2010 | 12 | - | 346 | 3 | - | 1 | - | - | - |
| 2015 | 9 | 29 | 471 | 13 | 5 | 15 | 1 | 3 | - |
| 2021 | 21 | 32 | 156 | 14 | - | 16 | 17 | 6 | 2 |
| 2025 | 1 | 30 | 267 | 2 | - | 26 | 24 | 1 | 3 |
| year | Average Cover (%) | | | | | | | | |
| 1997 | - | - | 3.5 | 0.9 | - | 0.0 | - | - | - |
| 2005 | 0.0 | - | 3.5 | 0.5 | - | 0.0 | - | - | - |
| 2010 | 0.2 | - | 5.1 | 0.1 | - | 0.1 | - | - | - |
| 2015 | 0.4 | 1.7 | 16.5 | 0.1 | 0.0 | 0.6 | 0.0 | 0.2 | - |
| 2021 | 0.2 | 1.0 | 1.0 | 0.2 | - | 0.3 | 0.1 | 0.1 | 0.0 |
| 2025 | 0.0 | 0.8 | 1.7 | 0.1 | - | 0.3 | 0.1 | 0.0 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-24.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Arenaria (sandwort) | Astragalus convallarius (lesser rushy milkvetch) | Chaenactis stevioides[a] (Esteve's pincushion) | Chamaesyce (sandmat) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum cernuum[a] (nodding buckwheat) | Eriogonum racemosum (redroot buckwheat) | Gilia inconspicua[a] (shy gilia) | Halogeton glomeratus[ai] (saltlover) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | - | 6 | 1 | - | 28 | - | - | 8 | - | 15 | - | 1 | 2 | - | - | - | 14 |
| 2005 | 1 | 48 | - | - | 46 | 18 | - | 2 | 27 | 1 | 147 | 33 | 0 | 37 | 51 | 24 | 134 |
| 2010 | - | 10 | - | 2 | 33 | - | - | 23 | - | 6 | 2 | 3 | 5 | - | 45 | - | 31 |
| 2015 | - | 161 | 7 | - | 47 | - | 17 | - | - | 8 | 47 | - | - | - | - | - | 25 |
| 2021 | 3 | 15 | - | - | 18 | - | 46 | - | - | 1 | - | - | - | - | - | - | - |
| 2025 | - | 4 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | 44 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | - | 0.0 | 0.0 | - | 0.2 | - | - | 0.0 | - | 0.0 | - | 0.0 | 0.1 | - | - | - | 0.0 |
| 2005 | 0.0 | 0.9 | - | - | 3.5 | 0.4 | - | 0.0 | 0.2 | 0.0 | 3.1 | 0.5 | 0.0 | 0.7 | 0.5 | 0.3 | 2.1 |
| 2010 | - | 0.0 | - | 0.0 | 2.1 | - | - | 0.1 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | 1.2 | - | 0.4 |
| 2015 | - | 1.7 | 0.2 | - | 1.4 | - | 0.0 | - | - | 0.0 | 0.6 | - | - | - | - | - | 0.2 |
| 2021 | 0.0 | 0.0 | - | - | 0.1 | - | 0.1 | - | - | 0.0 | - | - | - | - | - | - | - |
| 2025 | - | 0.0 | 0.0 | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Microsteris gracilis[a] (slender phlox) | Navarretia intertexta[a] (needleleaf navarretia) | Oenothera (evening primrose) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Townsendia (Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1997 | 28 | - | - | - | - | 13 | - | - | - | 42 | - | - |
| 2005 | 116 | - | - | 17 | - | 9 | 6 | 124 | 10 | 195 | - | 41 |
| 2010 | 70 | - | 2 | - | - | 1 | - | 252 | 2 | 116 | - | 4 |
| 2015 | 152 | 3 | - | - | 3 | 3 | 1 | 296 | 87 | 195 | 37 | 20 |
| 2021 | 9 | 1 | - | - | - | 3 | - | 69 | 21 | 229 | - | - |
| 2025 | 4 | - | - | - | - | 1 | - | 142 | - | 145 | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1997 | 0.1 | - | - | - | - | 0.0 | - | - | - | 0.1 | - | - |
| 2005 | 3.9 | - | - | 0.4 | - | 0.0 | 0.0 | 2.2 | 0.4 | 13.6 | - | 0.6 |
| 2010 | 0.4 | - | 0.0 | - | - | 0.0 | - | 16.3 | 0.0 | 3.2 | - | 0.0 |
| 2015 | 1.4 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 1.8 | 4.0 | 3.1 | 0.2 | 0.2 |
| 2021 | 0.1 | 0.0 | - | - | - | 0.0 | - | 5.6 | 0.3 | 4.6 | - | - |
| 2025 | 0.0 | - | - | - | - | 0.0 | - | 4.4 | - | 1.1 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-24.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Bassia prostrata[pi] (forage kochia) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 1997 | - | - | - | - |
| 2005 | 3.4 | - | - | - |
| 2010 | 4.4 | - | - | - |
| 2015 | 2.1 | - | - | 0.1 |
| 2021 | 3 | 0.8 | - | 1.2 |
| 2025 | 6.1 | 1.2 | 0.5 | 1.6 |
| year | Quadrat Cover (%) | | | |
| 1997 | 16.0 | - | - | 0.0 |
| 2005 | 2.4 | - | - | 0.3 |
| 2010 | 2.5 | - | - | 0.3 |
| 2015 | 1.4 | - | - | 0.5 |
| 2021 | 2.7 | 0.8 | 0.2 | 1.4 |
| 2025 | 6.8 | 0.2 | 0.3 | 1.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-24.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1997 | 8240 | - | 2 | 82 | 16 | 56 | 42 | 12 | 37/62 |
| 2005 | 1280 | 15000 | 5 | 11 | 84 | 36 | 61 | 69 | 34/46 |
| 2010 | 3380 | - | 47 | 49 | 5 | 20 | 10 | 3 | 36/52 |
| 2015 | 2860 | 40 | 25 | 49 | 27 | 62 | 12 | 27 | 22/36 |
| 2021 | 2020 | 60 | 20 | 47 | 34 | 33 | 37 | 35 | - / - |
| 2025 | 2980 | 1260 | 46 | 51 | 3 | 32 | 9 | 4 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 34/29 |
| 2021 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Bassia prostrata[pi] -- (forage kochia) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 49/82 |
| 2021 | 600 | 200 | 60 | 40 | 0 | 13 | 50 | 0 | - / - |
| 2025 | 760 | - | 13 | 87 | 0 | 5 | 61 | 0 | - / - |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 48/57 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 61/75 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 44/53 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. speciosa[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 65/110 |
| 2021 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 28/41 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1997 | 180 | - | 0 | 89 | 11 | 0 | 0 | 11 | 10/27 |
| 2005 | 260 | - | 0 | 62 | 39 | 0 | 0 | 23 | 11/38 |
| 2010 | 140 | - | 0 | 100 | 0 | 0 | 14 | 29 | 10/29 |
| 2015 | 200 | - | 0 | 100 | 0 | 30 | 0 | 10 | 12/34 |
| 2021 | 620 | - | 7 | 90 | 3 | 0 | 0 | 7 | - / - |
| 2025 | 340 | - | 6 | 53 | 41 | 0 | 0 | 71 | - / - |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 69/90 |
| 2015 | - | - | - | - | - | - | - | - | 57/49 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

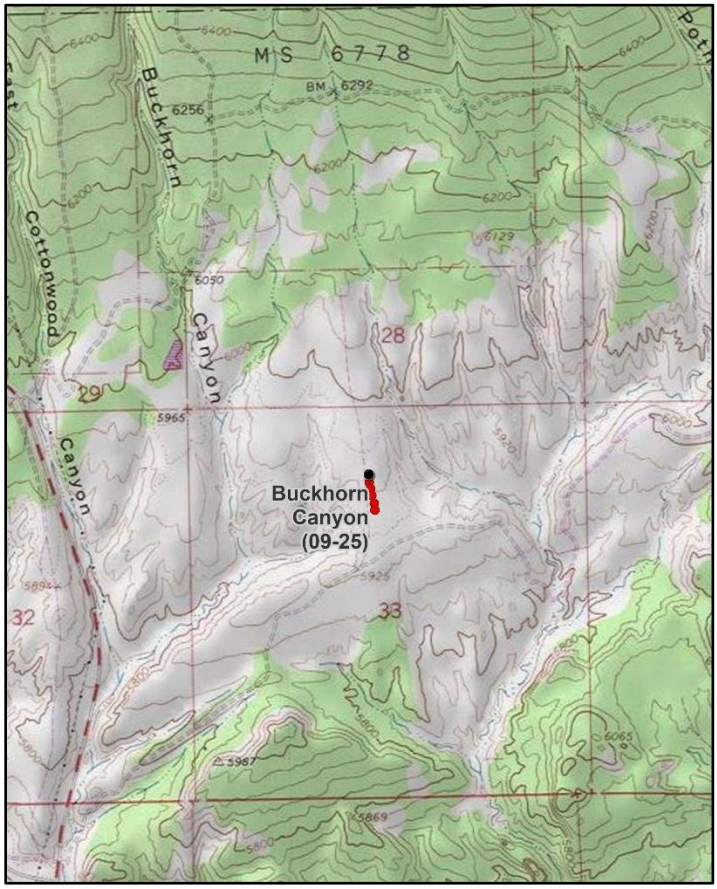
**Table 09-24.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

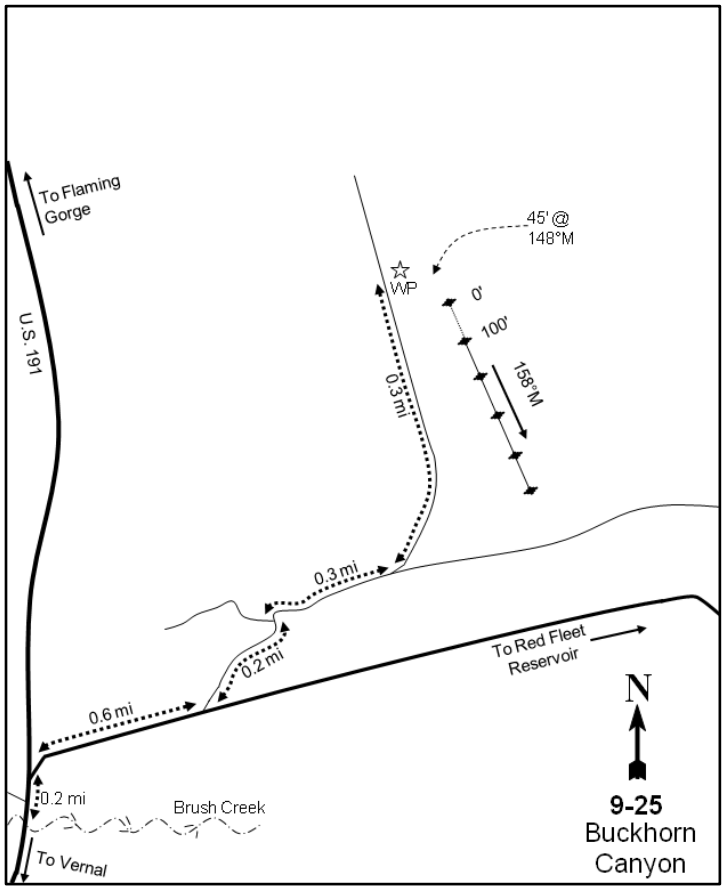
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2021 | 1 | - | 100 | - | - | - | 2.0 |
| 2025 | 1 | - | 100 | - | - | - | 8.0 |

**Table 09-24.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 20.0 | 10.3 | 1.2 | 1.9 | -2.6 | 1.1 | 0.0 | **31.9** | Fair |
| 2005 | 4.3 | 0.0 | 0.0 | 1.0 | -2.7 | 10.0 | 0.0 | **12.6** | Poor |
| 2010 | 5.5 | 0.0 | 0.0 | 0.6 | -3.9 | 10.0 | 0.0 | **12.2** | Poor |
| 2015 | 2.6 | 0.0 | 0.0 | 6.1 | -12.4 | 10.0 | 0.0 | **6.3** | Very Poor |
| 2021 | 4.8 | 0.0 | 0.0 | 3.8 | -0.8 | 10.0 | 0.0 | **17.8** | Poor |
| 2025 | 9.9 | 14.4 | 15.0 | 2.8 | -1.3 | 2.3 | 0.0 | **43.1** | Fair-Good |

# BUCKHORN CANYON - STUDY NO. 09-25




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Donkey Flat NW; Township 2S, Range 22E, Section 33 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 630897 East 4496132 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 420 |
| Transect Bearing | 158° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from Vernal, proceed north on Highway 191. After Highway 191 crosses Brush Creek, continue 0.2 miles and turn right onto the road that leads to Red Fleet Reservoir. Continue driving on this road for 0.6 miles, then turn left onto a dirt road. Go 0.2 miles to a fork. Proceed to the right and continue 0.3 miles to another fork. Turn left and travel for another 0.3 miles. The witness post is a red, full-high fence post about 50 feet off of the right (east) side of the road. The 0-foot stake is 45 feet south of the witness post at a bearing of 148 degrees magnetic and is marked with browse tag #120.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | BRUSH CREEK |
| Elevation | 5,970ft (1,820m) |
| Aspect | South |
| Slope | 3-4% |
| Sample Dates | 09/12/2001, 07/20/2005, 07/28/2009, 07/21/2010, 07/06/2015, 07/13/2020, 07/22/2025 |

**Table 09-25.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Brush Creek Juniper Removal 2004 | LTDL 1547-4355 | November 2004 | 1100 |
| Hand Crew - Lop and Scatter | Red Fleet Maintenance | 2273 | September-October 2012 | 317 |

## Wildlife Habitat and Vegetation History

**Table 09-25.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |

**Table 09-25.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2001 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush | Early Phase I |
| 2009 | Wyoming Big Sagebrush | Early Phase I |
| 2010 | Wyoming Big Sagebrush | Early Phase I |
| 2015 | Wyoming Big Sagebrush | Early Phase I |
| 2020 | Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 09-25.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.7 | 35.6 | 33.8 | 30.6 | 1.4 | 4.1 | 57.6 | 0.4 | 09/12/2001 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 2001-2005 - Current Potential State: Community Phase 2.1<br>2009 - Current Potential State: Community Phase 2.4<br>2010 - Current Potential State: Community Phase 2.1<br>2015 - Current Potential State: Community Phase 2.4<br>2020-2025 - Current Potential State: Community Phase 2.1 |

Since study establishment in 2001, the plant community on this site has remained in a stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) as the dominant species. Cover and density of sagebrush have fluctuated over the duration of the study, but both have increased overall between 2005 and 2025 (Table 09-25.12, Table 09-25.13). The composition of the herbaceous understory has varied over the study period with the introduced annual grass species cheatgrass (*Bromus tectorum*) being sampled in high abundance in 2009 and 2015. Native perennial grasses such as thickspike wheatgrass (*Elymus lanceolatus*) and needle and thread (*Hesperostipa comata*) contribute a majority of the understory cover as of 2025. However, this site could be at risk for catastrophic wildfire should cheatgrass abundance increase again in the future (Table 09-25.7, Table 09-25.10, Table 09-25.11). Utah juniper (*Juniperus osteosperma*) has been observed in the area throughout the sample period; the persistent tree component indicates that there may be potential for infilling over time. However, the site has remained within Early Phase I of woodland succession since study establishment, suggesting that infilling is likely not an immediate concern (Photos, Table 09-25.4, Table 09-25.12, Table 09-25.13).

Deer winter range condition has varied slightly from year to year and has ranged from fair to excellent; condition stability can be attributed to stable preferred browse and perennial grass cover. In 2025, deer winter range condition was considered to be good. Improvement to deer wintering range can been achieved through efforts that increase preferred browse recruitment and cover, while increasing native perennial grass cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 09-25.6, Table 09-25.7, Table 09-25.13, Table 09-25.15). Pellet transect data shows that deer presence was high in 2001, 2010, 2020 and 2025. During the 2024/25 winter season the area had nearby occurrences of collared mule deer, but no occurrences on the site itself (Wildlife Migration Initiative). Furthermore, at least 50% of Wyoming bigsagebrush plants sampled in density strips have been moderately to heavily hedged in most sample years. Pellet group data also shows that cattle presence has been high in most years sampled; repeat photography shows that there is little to no use occurring on

perennial grasses during high pellet count years (Photos, Table 09-25.9, Table 09-25.13). However, on-site observations in 2025 noted light utilization (10-20%) occurring on needle and thread grass, and little to no utilization on forb species.

## Trend Summary Tables

**Table 09-25.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2001 | 21.1 | 0.5 | 1.0 | - | - | - |
| 2005 | 6.2 | 0.6 | 0.2 | 7.4 | 0.5 | 0.2 |
| 2009 | 12.1 | 0.3 | 0.5 | 13.1 | 0.4 | 0.3 |
| 2010 | 9.1 | 0.2 | 0.5 | 10.2 | 0.5 | 0.5 |
| 2015 | 12.6 | 0.5 | - | 14.9 | 0.8 | - |
| 2020 | 13.7 | 0.2 | - | 16.0 | 0.3 | - |
| 2025 | 16.1 | 0.4 | - | 13.9 | 0.3 | - |

**Table 09-25.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2001 | 25 | 314 | 135 | 181 | 0.1 | 5.4 | 0.4 | 1.1 |
| 2005 | 52 | 288 | 360 | 155 | 0.6 | 7.8 | 9.6 | 5.4 |
| 2009 | 366 | 261 | 48 | 172 | 15.5 | 14.1 | 0.8 | 5.9 |
| 2010 | 134 | 299 | 25 | 156 | 2.0 | 12.8 | 0.3 | 3.3 |
| 2015 | 451 | 211 | 131 | 141 | 27.1 | 7.0 | 3.7 | 1.9 |
| 2020 | 338 | 309 | 208 | 118 | 7.1 | 12.3 | 1.4 | 1.2 |
| 2025 | 116 | 300 | 118 | 97 | 0.7 | 10.3 | 0.9 | 0.6 |

**Table 09-25.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2001 | 50.0 | 4.4 | 31.0 | 0.5 | 0.0 | 26.9 |
| 2005 | 49.8 | 2.8 | 30.6 | 1.0 | 0.0 | 25.8 |
| 2009 | 34.5 | 2.5 | 32.9 | 0.9 | 0.0 | 49.5 |
| 2010 | 33.9 | 1.6 | 46.3 | 0.4 | 0.0 | 31.2 |
| 2015 | 23.5 | 3.8 | 45.8 | 1.1 | 0.0 | 48.7 |
| 2020 | 16.3 | 3.1 | 51.0 | 5.7 | 0.0 | 34.8 |
| 2025 | 43.9 | 2.5 | 40.8 | 2.0 | 0.2 | 25.5 |

**Table 09-25.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 2001 | 10 | 62 | 10 | - | 25 |
| 2005 | 5 | 47 | 9 | - | 67 |
| 2009 | 17 | 48 | 4 | - | 37 |
| 2010 | 8 | 33 | 4 | - | 29 |
| 2015 | 10 | 30 | - | - | 58 |
| 2020 | 13 | 37 | 8 | - | 36 |
| 2025 | 5 | 58 | - | - | 14 |
| Year | Days Use Per Acre (ha) | | | | |
| 2001 | 27.6 (68.1) | 175.6 (433.7) | 27.5 (67.9) | - | - |
| 2005 | 29.0 (71.7) | 36.8 (91.0) | 10.7 (26.5) | - | - |
| 2009 | 24.0 (59.2) | 38.2 (94.4) | 0.7 (1.7) | - | - |
| 2010 | 21.1 (52.0) | 57.0 (140.7) | 8.7 (21.5) | 1.7 (4.3) | - |
| 2015 | 38.5 (95.0) | 24.8 (61.2) | - | - | - |
| 2020 | 42.8 (105.8) | 117.3 (289.7) | 4.0 (9.9) | - | - |
| 2025 | 16.7 (41.2) | 61.7 (152.3) | 4.7 (11.6) | - | - |

**Table 09-25.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 2001 | 2 | 25 | 57 | 187 | 50 | 106 | - |
| 2005 | 5 | 52 | 49 | 186 | 59 | 84 | 4 |
| 2009 | 3 | 366 | 17 | 36 | 76 | 56 | 125 |
| 2010 | 14 | 134 | 25 | 180 | 93 | 77 | - |
| 2015 | 9 | 451 | 5 | 99 | 98 | 24 | - |
| 2020 | 29 | 338 | 38 | 30 | 103 | 95 | 124 |
| 2025 | 6 | 116 | 6 | 203 | 111 | 59 | - |
| year | Average Cover (%) | | | | | | |
| 2001 | 0.0 | 0.1 | 1.0 | 2.1 | 1.1 | 1.2 | - |
| 2005 | 0.1 | 0.6 | 0.3 | 4.3 | 2.2 | 0.9 | 0.0 |
| 2009 | 0.5 | 15.5 | 0.7 | 1.7 | 5.1 | 0.8 | 5.4 |
| 2010 | 0.2 | 2.0 | 0.4 | 6.3 | 5.0 | 0.8 | - |
| 2015 | 0.1 | 27.1 | 0.1 | 2.7 | 3.8 | 0.3 | - |
| 2020 | 0.9 | 7.1 | 0.4 | 1.1 | 4.2 | 0.6 | 5.1 |
| 2025 | 0.0 | 0.7 | 0.2 | 4.8 | 4.8 | 0.5 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-25.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) | Grindelia squarrosa (curlycup gumweed) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Lomatium (desertparsley) | Machaeranthera canescens (hoary tansyaster) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2001 | - | 5 | 11 | 9 | - | - | - | - | 50 | - | - | - | 100 | - | - | 2 | 124 |
| 2005 | - | 5 | 11 | 37 | 4 | 2 | - | 7 | 92 | 1 | 15 | - | 324 | - | 2 | 4 | 18 |
| 2009 | - | 5 | - | - | - | - | - | 3 | 6 | - | - | 13 | 34 | - | - | - | - |
| 2010 | - | 2 | 3 | - | 1 | - | - | - | 10 | - | 3 | - | 2 | - | 2 | 5 | 17 |
| 2015 | 42 | - | - | 1 | - | - | - | 4 | 24 | - | - | - | 71 | 2 | - | 5 | 14 |
| 2020 | 200 | - | - | 12 | - | - | - | - | - | - | - | - | 7 | - | - | 9 | 8 |
| 2025 | 109 | - | - | - | - | - | 1 | - | 7 | - | - | - | 39 | - | - | - | 20 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2001 | - | 0.2 | 0.0 | 0.0 | - | - | - | - | 0.1 | - | - | - | 0.2 | - | - | 0.0 | 0.6 |
| 2005 | - | 0.3 | 0.0 | 0.4 | 0.0 | 0.0 | - | 0.1 | 1.2 | 0.0 | 0.4 | - | 7.2 | - | 0.0 | 0.0 | 0.1 |
| 2009 | - | 0.0 | - | - | - | - | - | 0.0 | 0.1 | - | - | 0.8 | 0.3 | - | - | - | - |
| 2010 | - | 0.0 | 0.0 | - | 0.0 | - | - | - | 0.1 | - | 0.0 | - | 0.0 | - | 0.0 | 0.1 | 0.1 |
| 2015 | 1.4 | - | - | 0.0 | - | - | - | 0.0 | 0.4 | - | - | - | 0.5 | 0.0 | - | 0.0 | 0.0 |
| 2020 | 1.3 | - | - | 0.0 | - | - | - | - | - | - | - | - | 0.0 | - | - | 0.0 | 0.0 |
| 2025 | 0.8 | - | - | - | - | - | 0.0 | - | 0.0 | - | - | - | 0.1 | - | - | - | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2001 | - | - | - | - | 67 | - | 20 | - |
| 2005 | - | 68 | - | - | 119 | - | 14 | - |
| 2009 | 3 | 13 | - | - | 152 | 2 | 7 | - |
| 2010 | - | 5 | 1 | - | 138 | - | 5 | 4 |
| 2015 | 11 | - | 1 | 24 | 124 | - | 7 | - |
| 2020 | 7 | - | 1 | 2 | 104 | - | 5 | 2 |
| 2025 | - | - | - | - | 81 | - | - | - |
| year | Average Cover (%) | | | | | | | |
| 2001 | - | - | - | - | 0.3 | - | 0.0 | - |
| 2005 | - | 0.4 | - | - | 4.6 | - | 0.2 | - |
| 2009 | 0.0 | 0.3 | - | - | 5.0 | 0.0 | 0.0 | - |
| 2010 | - | 0.2 | 0.0 | - | 3.0 | - | 0.0 | 0.0 |
| 2015 | 0.1 | - | 0.0 | 1.3 | 1.8 | - | 0.0 | - |
| 2020 | 0.0 | - | 0.0 | 0.0 | 1.1 | - | 0.0 | 0.0 |
| 2025 | - | - | - | - | 0.4 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-25.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (pricklypear) |
|---|---|---|---|
| year | Line Intercept Cover | | |
| 2001 | - | - | - |
| 2005 | 7.4 | 0.2 | 0.5 |
| 2009 | 13.1 | 0.3 | 0.4 |
| 2010 | 10.2 | 0.5 | 0.5 |
| 2015 | 14.9 | - | 0.8 |
| 2020 | 16 | - | 0.3 |
| 2025 | 13.9 | - | 0.3 |
| year | Quadrat Cover (%) | | |
| 2001 | 21.1 | 1.0 | 0.5 |
| 2005 | 6.2 | 0.2 | 0.6 |
| 2009 | 12.1 | 0.5 | 0.3 |
| 2010 | 9.1 | 0.5 | 0.2 |
| 2015 | 12.6 | - | 0.5 |
| 2020 | 13.7 | - | 0.2 |
| 2025 | 16.1 | - | 0.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-25.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2001 | 4900 | - | 2 | 49 | 49 | 41 | 12 | 22 | 48/70 |
| 2005 | 4120 | 14900 | 31 | 12 | 57 | 24 | 41 | 44 | 48/69 |
| 2009 | - | - | - | - | - | - | - | - | 48/68 |
| 2010 | 6540 | 400 | 39 | 40 | 21 | 11 | 20 | 14 | 41/66 |
| 2015 | 6300 | 120 | 16 | 68 | 16 | 24 | 57 | 17 | 35/55 |
| 2020 | 5300 | 1600 | 17 | 55 | 28 | 53 | 11 | 20 | 43/72 |
| 2025 | 5640 | - | 5 | 70 | 25 | 30 | 23 | 28 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | 143/91 |
| 2010 | - | - | - | - | - | - | - | - | 100/143 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 112/145 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 62/142 |
| 2009 | - | - | - | - | - | - | - | - | 73/153 |
| 2010 | - | - | - | - | - | - | - | - | 81/188 |
| 2015 | - | - | - | - | - | - | - | - | 68/92 |
| 2020 | - | - | - | - | - | - | - | - | 89/179 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 31/38 |
| 2009 | - | - | - | - | - | - | - | - | 22/35 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 120 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 2001 | 420 | - | 10 | 67 | 24 | 0 | 0 | 0 | 8/29 |
| 2005 | 640 | - | 3 | 84 | 13 | 0 | 0 | 22 | 11/37 |
| 2009 | - | - | - | - | - | - | - | - | 11/39 |
| 2010 | 420 | - | 0 | 95 | 5 | 0 | 0 | 0 | 11/38 |
| 2015 | 580 | - | 3 | 83 | 14 | 3 | 0 | 38 | 11/28 |
| 2020 | 240 | - | 8 | 75 | 17 | 0 | 0 | 0 | 10/39 |
| 2025 | 540 | - | 0 | 93 | 7 | 0 | 0 | 26 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

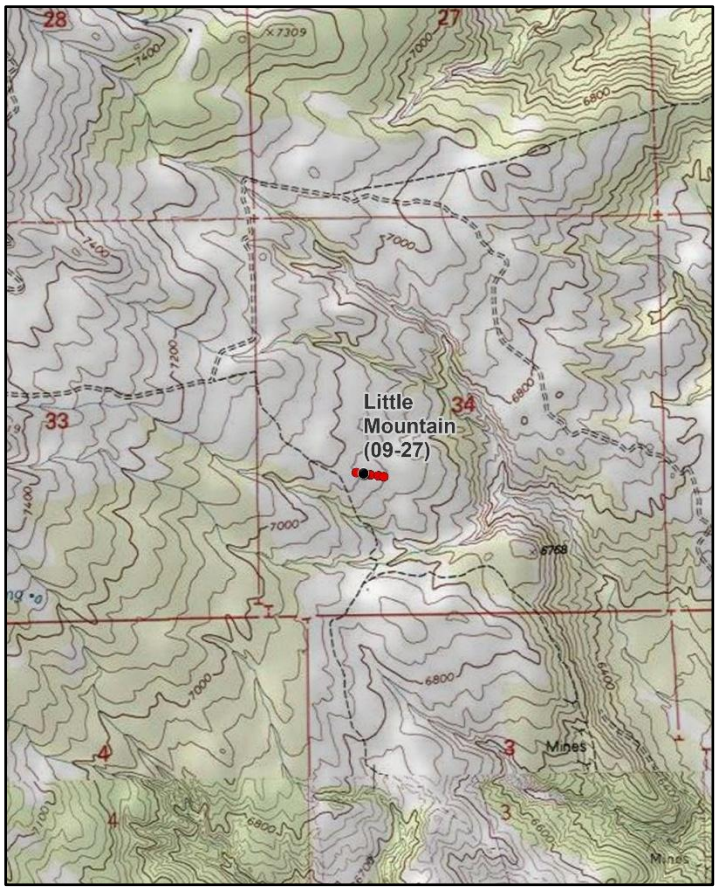
**Table 09-25.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

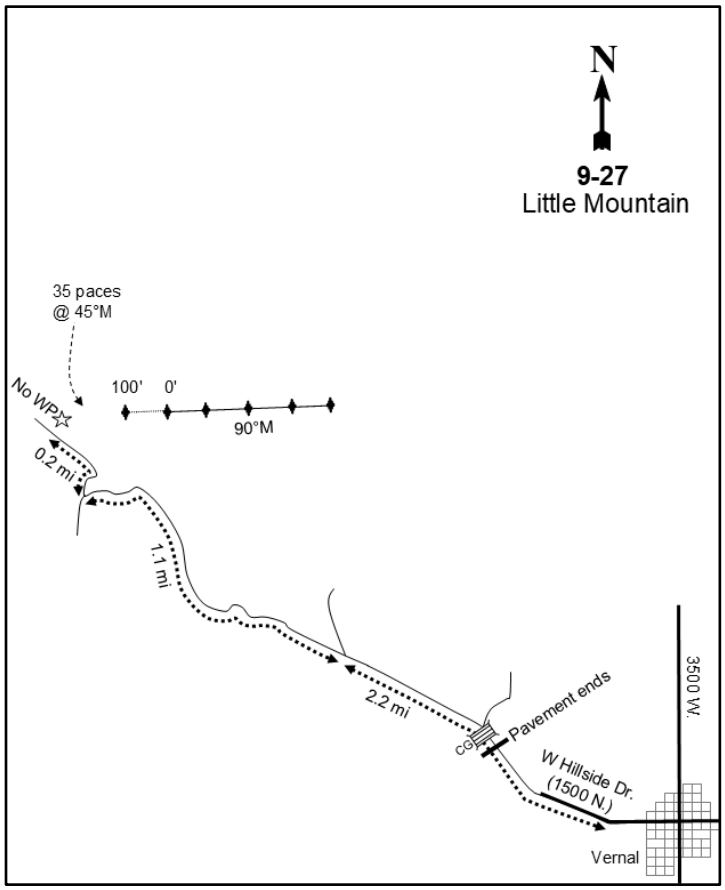
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2009 | 19 | 8 | 92 | - | - | - | 2.1 |
| 2020 | 4 | 33 | 67 | - | - | - | 2.0 |
| 2025 | 3 | - | 100 | - | - | - | 3.0 |

**Table 09-25.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2001 | 26.4 | 0.2 | 0.8 | 10.8 | -0.1 | 2.2 | 0.0 | **40.3** | Fair |
| 2005 | 9.3 | -2.2 | 15.0 | 15.6 | -0.4 | 10.0 | 0.0 | **47.3** | Good |
| 2009 | 16.4 | 0.0 | 0.0 | 28.1 | -11.6 | 10.0 | 0.0 | **42.9** | Fair |
| 2010 | 12.8 | 8.8 | 15.0 | 25.7 | -1.5 | 6.5 | 0.0 | **67.3** | Excellent |
| 2015 | 18.6 | 10.2 | 8.0 | 13.9 | -20.0 | 3.7 | 0.0 | **34.4** | Fair |
| 2020 | 20.0 | 6.5 | 8.5 | 24.5 | -5.3 | 2.4 | 0.0 | **56.6** | Good |
| 2025 | 17.4 | 7.4 | 2.3 | 20.6 | -0.5 | 1.2 | 0.0 | **48.4** | Good |

# LITTLE MOUNTAIN - STUDY NO. 09-27




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Dry Fork SE; Township 3S, Range 20E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 612888 East 4485328 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 792 |
| Transect Bearing | 90° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft), Line 5 (71ft) |
| Belt Marker Placement | Line 5: 75ft Long |

**Directions to Site**

***Do not take Coal Mine Basin Road.***

Driving from the intersection of State Route 121 and Little Mountain Loop Road (gravel pit to the south), travel north along Little Mountain Loop Rd. for 2.4 miles to a "Y" intersection. Bear left and continue along Little Mountain Loop Rd. for 1.3 miles to another "Y" intersection. Turn right on to Little Mountain Road; travel for another 2.7 miles to an intersection and stay right. Drive for 1.5 miles to a right turn (east); turn right onto Shindy Ridge Road. Travel along Shindy Ridge Road for 1.1 miles while passing through an intersection. Park near the study site on the west side of the road; there is no witness post. The 0-foot stake is marked with browse tag #792.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | COAL MINE BASIN |
| Elevation | 6,950ft (2,118m) |
| Aspect | East |
| lope | 11% |
| Sample Dates | 07/13/2015, 07/08/2020, 06/18/2025 |

**Table 09-27.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Imazapic | 2021-GRD- Herbicide Treatment - Coalmine Basin, Cottonwood | 5721 | August 2021 | 7697 |
| Hand Crew - Lop and Scatter | - | - | Between 2020 and 2025 | - |
| Chaining - Two-Way Unknown | Coalmine Basin Seeding | LTDL 2547-7024 | March 1965-January 1966 | 1700 |
| Seeding - Aerial After | Coalmine Basin Seeding | LTDL 2547-7023 | March 1965-January 1966 | 1700 |
| Seeding - Hand Planter | Coalmine Basin Seeding | LTDL 2547-7023 | March 1965-January 1966 | 1700 |
| Hand Crew - Lop and Scatter | Dry Fork Hazardous Fuel Project Phase II | 2789 | August-September 2013 | 1842 |

**Table 09-27.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Coalmine Basin Seeding Aerial | | | Aerial | Dec 1966 | 1700 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | | 10.00 | 0.00 |
| F | Medicago sativa | Alfalfa | Nomad | 2.00 | 0.00 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Coalmine Basin Seeding Browse | | | Broadcast | Dec 1966 | 1700 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Atriplex canescens | Fourwing Saltbush | | 1.00 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 09-27.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |

**Table 09-27.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2015 | Perennial Grass/Black Sagebrush | Early Phase I |
| 2020 | Perennial Grass/Black Sagebrush | Phase I |
| 2025 | Perennial Grass/Black Sagebrush | Early Phase I |

## Site Notes

Line 5 is approximately 75 feet in length due to an old two-track road at the end of the transect.

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Upland Shallow Loam (Black Sagebrush) |
| NRCS Ecological Site # | R047XC320UT |
| States and Transitions | 2015-2025 - Current Potential State: Community Phase 2.1 |

Since the study was established in 2015, the plant community has remained dominated by a mixture of black sagebrush (*Artemisia nova*) and perennial grasses. Utah juniper (*Juniperus osteosperma*) has been present in all years; many trees were removed prior to study establishment by a lop and scatter treatment in 2013. In 2015, many of the treated juniper trees were found to have live growth at their bases and some younger trees had not been treated. In 2020, density of juniper decreased, but cover increased substantially. However, tree cover and density decreased in 2025 due to an additional lop and scatter treatment that took place sometime between the two most recent sample years (Table 09-27.1, Table 09-27.12, Table 09-27.13, Table 09-27.14). The herbaceous understory has been abundant throughout the study period. However, herbaceous species have not been overly diverse; the introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) has contributed a majority of the herbaceous cover in all sample years (Table 09-27.7, Table 09-27.10, Table 09-27.11).

Deer winter range condition has improved substantially from poor-fair to excellent. The improvement in condition quality can be attributed to the increase in preferred browse recruitment and cover, and perennial grass and forb cover. In 2025, deer winter range condition was considered to be excellent (Table 09-27.6, Table 09-27.7, Table 09-27.13, Table 09-27.15). Pellet transect data shows that deer and elk presence has remained low over the sample period (Table 09-27.9). Utilization of black and mountain big sagebrush has been light in most sample years (Table 09-27.13). On-site observations in 2025 noted that both crested wheatgrass and lesser rushy milkvetch (*Astragalus convallarius*) had light utilization (10-20%).

## Trend Summary Tables

**Table 09-27.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2015 | 7.8 | 0.3 | 2.3 | 11.4 | 0.4 | 3.5 |
| 2020 | 9.0 | 1.7 | 5.3 | 12.2 | 1.2 | 7.4 |
| 2025 | 16.7 | 0.2 | 0.4 | 16.1 | 1.1 | 0.7 |

**Table 09-27.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2015 | 9 | 316 | 16 | 120 | 0.0 | 12.5 | 0.3 | 2.4 |
| 2020 | 0 | 333 | 8 | 109 | 0.0 | 22.8 | 0.0 | 2.8 |
| 2025 | 3 | 323 | 5 | 138 | 0.0 | 15.8 | 0.0 | 3.3 |

**Table 09-27.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2015 | 17.9 | 0.5 | 46.8 | 11.9 | 7.0 | 28.3 |
| 2020 | 17.1 | 0.4 | 47.5 | 13.1 | 13.2 | 40.5 |
| 2025 | 17.1 | 0.2 | 41.7 | 13.6 | 9.1 | 32.2 |

**Table 09-27.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2015 | 3 | - | - | 28 |
| 2020 | 2 | 1 | 1 | 5 |
| 2025 | 5 | 1 | - | 9 |
| Year | Days Use Per Acre (ha) | | | |
| 2015 | 4.4 (10.8) | 1.3 (3.3) | - | - |
| 2020 | 5.1 (12.6) | 1.3 (3.3) | - | - |
| 2025 | 11.6 (28.7) | 4.7 (11.6) | - | - |

**Table 09-27.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 2015 | 300 | 9 | 5 | 3 | 1 | 24 | 32 |
| 2020 | 327 | 0 | - | 2 | 7 | 9 | 4 |
| 2025 | 321 | 3 | - | - | - | 9 | - |
| year | Average Cover (%) | | | | | | |
| 2015 | 11.7 | 0.0 | 0.1 | 0.0 | 0.0 | 0.4 | 0.3 |
| 2020 | 22.5 | 0.0 | - | 0.0 | 0.2 | 0.1 | 0.1 |
| 2025 | 15.7 | 0.0 | - | - | - | 0.1 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 09-27.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Antennaria dimorpha (low pussytoes) | Arabis (rockcress) | Arenaria (sandwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus spatulatus (tufted milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Caulanthus crassicaulis[a] (thickstem wild cabbage) | Chaetopappa ericoides (rose heath) | Cordylanthus[a] (bird's-beak) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Hedysarum boreale (Utah sweetvetch) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2015 | - | 22 | 4 | - | 41 | 8 | - | 2 | 2 | - | - | - | - | 14 | - | 4 | 26 |
| 2020 | - | 1 | - | 5 | 14 | 5 | - | - | 4 | 3 | 4 | 1 | 1 | - | - | 2 | 29 |
| 2025 | 5 | 2 | 1 | 5 | 60 | 1 | 4 | - | - | - | - | - | 9 | 2 | 2 | 6 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2015 | - | 0.0 | 0.0 | - | 0.5 | 0.0 | - | 0.0 | 0.0 | - | - | - | - | 0.2 | - | 0.0 | 1.2 |
| 2020 | - | 0.0 | - | 0.0 | 0.1 | 0.0 | - | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.7 |
| 2025 | 0.1 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Heterotheca villosa (hairy false goldenaster) | Ipomopsis congesta (ballhead ipomopsis) | Linum lewisii (Lewis flax) | Lithospermum (stoneseed) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Salsola tragus[ani] (prickly Russian thistle) | Sphaeralcea coccinea (scarlet globemallow) | Tetraneuris acaulis (stemless four-nerve daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 2015 | - | 3 | 3 | - | - | - | 19 | 30 | 2 | 4 | - | 3 | - |
| 2020 | - | 8 | - | 2 | - | - | 22 | 37 | 3 | 2 | - | 8 | 4 |
| 2025 | 1 | - | - | - | 1 | 5 | 17 | 36 | 4 | - | 3 | 14 | - |
| year | Average Cover (%) | | | | | | | | | | | | |
| 2015 | - | 0.0 | 0.0 | - | - | - | 0.3 | 0.2 | 0.0 | 0.0 | - | 0.0 | - |
| 2020 | - | 0.0 | - | 0.0 | - | - | 0.8 | 0.8 | 0.2 | 0.0 | - | 0.1 | 0.0 |
| 2025 | 0.0 | - | - | - | 0.0 | 0.0 | 0.8 | 1.4 | 0.0 | - | 0.0 | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 09-27.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Linanthus pungens (granite prickly phlox) | Opuntia (pricklypear) | Pediocactus simpsonii (mountain ball cactus) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 2015 | 10 | 0.8 | 0.5 | - | 0.3 | 0.1 | 0.1 | 3.5 | - | - | - |
| 2020 | 10.7 | 0.3 | 1.1 | - | 0.5 | 0.1 | 0.5 | 7.4 | 0.1 | 0.1 | - |
| 2025 | 13.4 | 1.7 | 1 | - | 0.8 | - | 0.3 | 0.7 | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 2015 | 6.6 | 0.8 | 0.2 | - | 0.0 | 0.1 | 0.2 | 2.3 | 0.0 | 0.0 | 0.0 |
| 2020 | 7.5 | 0.8 | 0.5 | 0.0 | 0.4 | 0.1 | 1.3 | 5.3 | 0.0 | 0.0 | - |
| 2025 | 12.6 | 2.8 | 1.4 | 0.0 | 0.0 | - | 0.2 | 0.4 | - | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 09-27.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 38/35 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 2015 | 5920 | 200 | 3 | 60 | 37 | 39 | 26 | 36 | 24/45 |
| 2020 | 9880 | 2820 | 32 | 55 | 13 | 0 | 8 | 14 | 23/40 |
| 2025 | 9060 | 500 | 33 | 64 | 4 | 26 | 23 | 4 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2015 | 240 | - | 25 | 50 | 25 | 25 | 0 | 17 | 66/87 |
| 2020 | 200 | 480 | 50 | 50 | 0 | 20 | 0 | 0 | 61/79 |
| 2025 | 180 | 20 | 11 | 78 | 11 | 22 | 0 | 11 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 63/90 |
| 2020 | - | - | - | - | - | - | - | - | 37/46 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 2015 | 960 | 20 | 6 | 90 | 4 | 0 | 88 | 13 | 10/24 |
| 2020 | 900 | - | 0 | 89 | 11 | 16 | 9 | 7 | 12/29 |
| 2025 | 1080 | - | 7 | 89 | 4 | 7 | 72 | 4 | - / - |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 34/35 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | 15/27 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Eriogonum microthecum[p] -- (slender buckwheat) | | | | | | | | | |
| 2015 | 300 | - | 7 | 93 | 0 | 27 | 20 | 7 | 12/14 |
| 2020 | 220 | 20 | 9 | 82 | 9 | 0 | 0 | 9 | 12/13 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 2015 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 36/35 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 48/54 |
| 2025 | 240 | 20 | 58 | 42 | 0 | 17 | 17 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2015 | 340 | 80 | 53 | 47 | 0 | 0 | 0 | 0 | 17/19 |
| 2020 | 1000 | - | 18 | 76 | 6 | 0 | 0 | 2 | 20/25 |
| 2025 | 700 | 20 | 6 | 94 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2015 | 700 | 20 | 86 | 11 | 3 | 0 | 0 | 6 | - / - |
| 2020 | 580 | 40 | 83 | 17 | 0 | 0 | 0 | 3 | - / - |
| 2025 | 540 | 20 | 56 | 41 | 4 | 0 | 7 | 4 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 15/26 |
| 2020 | - | - | - | - | - | - | - | - | 28/34 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 2015 | 60 | 40 | 0 | 67 | 33 | 67 | 0 | 0 | 11/12 |
| 2020 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | 9/10 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 11/28 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/26 |
| 2025 | 100 | - | 0 | 80 | 20 | 0 | 0 | 20 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

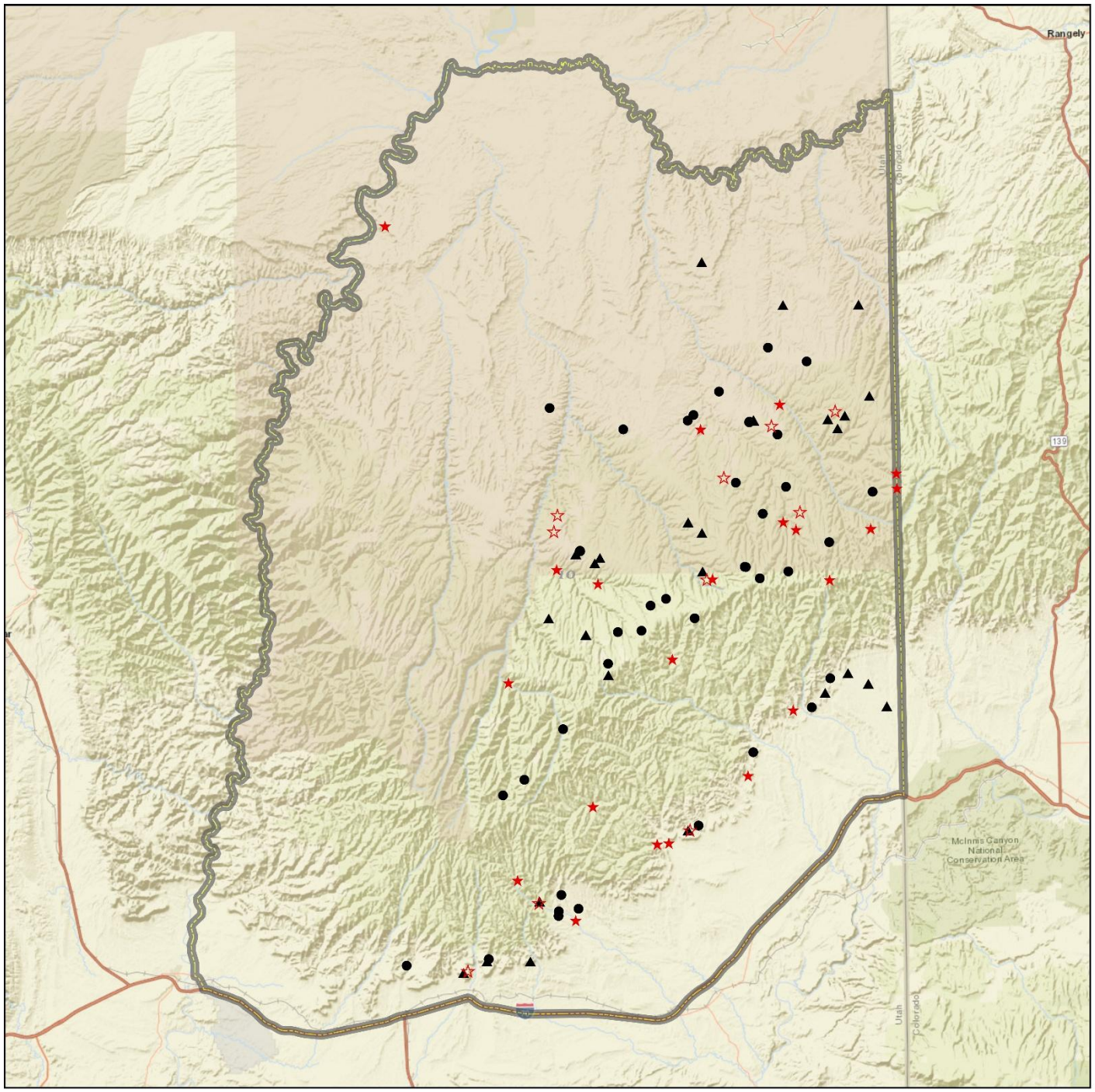
**Table 09-27.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 421 | 5 | 95 | - | - | - | 3.0 |
| 2020 | 328 | - | 70 | 30 | - | - | 6.9 |
| 2025 | 273 | 15 | 85 | - | - | - | 2.7 |

**Table 13A-01.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2015 | 14.3 | 4.8 | 2.5 | 25.0 | 0.0 | 4.8 | 0.0 | **51.4** | Poor-Fair |
| 2020 | 15.3 | 11.3 | 14.9 | 30.0 | 0.0 | 5.6 | 0.0 | **77.1** | Good |
| 2025 | 20.1 | 13.6 | 14.4 | 30.0 | 0.0 | 6.5 | 0.0 | **84.6** | Excellent |

# WILDLIFE MANAGEMENT UNIT 10 – BOOK CLIFFS




Miles
0 4 8 16 24 32 40 48 56 64

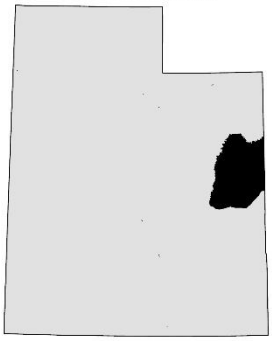
**Study Locations**
**Project, Status**

- RT, Active
- RT, Suspended
- WRI, Active
- WRI, Suspended

**Unit Boundary**

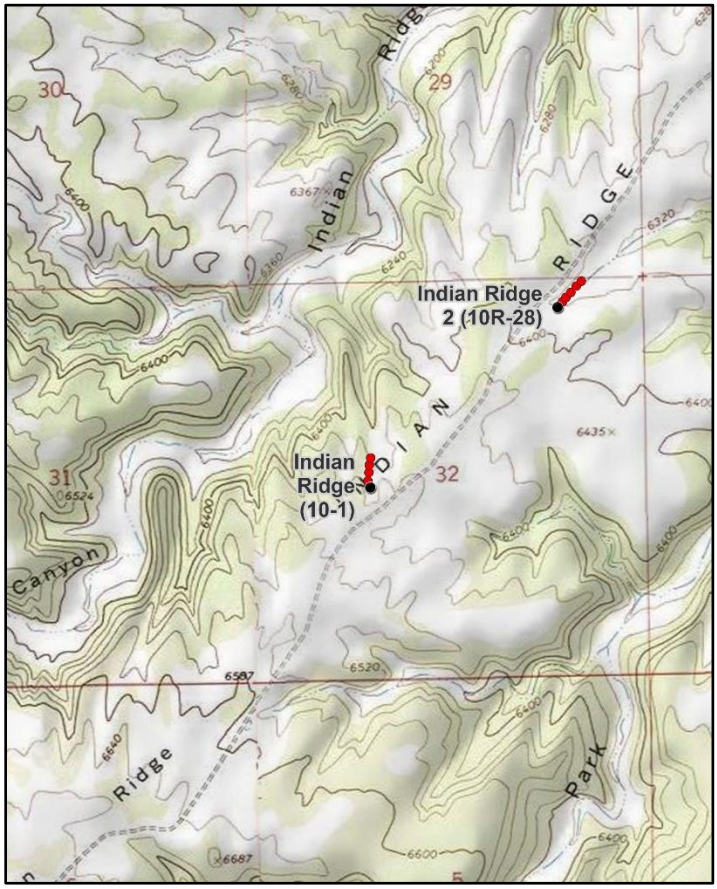
- Unit - 10

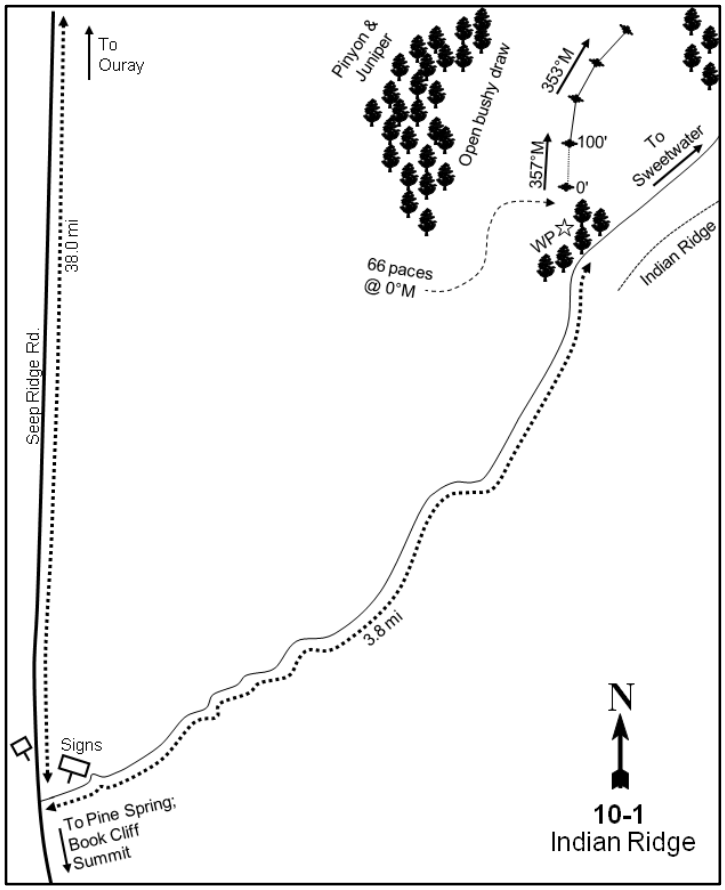
**Area of Interest**



Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# INDIAN RIDGE - STUDY NO. 10-1




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cooper Canyon SW; Township 13S, Range 23E, Section 32 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 639853 East 4389381 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 357° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Ouray, travel 38 miles south to the McCook Ridge-Indian Ridge turn off. Turn left (east) and travel on Indian Ridge Road toward Sweetwater Canyon and McCook Ridge for 3.8 miles. Stop by the head of a small sagebrush-saltbush draw that is marked by a 20-inch tall fencepost on the left (north) side of the road. Walk down the draw 60 paces to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SUNDAY SCHOOL CANYON |
| Elevation | 6,300ft (1,920m) |
| Aspect | North |
| Slope | 6% |
| Sample Dates | 06/23/1995, 06/05/2000, 06/06/2005, 06/07/2010, 06/01/2015, 06/01/2020, 06/09/2025 |

**Table 10-01.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Indian Ridge Lop and Scatter | 1079 | June 2009 | 1001 |
| Herbicide - Plateau | Indian Ridge Sagebrush | 1952 | October 2011 | 218 |
| Seeding - Rangeland Drill | Indian Ridge Sagebrush | 1952 | September 2011 | 218 |
| Hand Crew - Lop and Scatter | Seep Ridge Maintenance Lop & Scatter | 5517 | September-October 2021 | 3814 |

## Wildlife Habitat and Vegetation History

**Table 10-01.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Pronghorn | substantial | year-long |

**Table 10-01.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 1988 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 1995 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2000 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2005 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2010 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2015 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2020 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2025 | Annual-Perennial Grass/Fourwing Saltbush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-01.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.8 | 36.0 | 38.0 | 26.0 | 1.7 | 2.4 | 275.2 | 0.6 | 06/05/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Upland Silt Loam (Fourwing Saltbush-Winterfat) |
| NRCS Ecological Site # | R034BY329UT |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1982, fourwing saltbush (*Atriplex canescens*) has been the dominant shrub on this site. Other shrub species such as black sagebrush (*Artemisia nova*) have also been observed, but they have provided little additional cover (Photos, Pre-1992 Data, Table 10-01.12, Table 10-01.13). Perennial grass species have been present, but they were a minor component of the herbaceous understory through the 2020 year. The introduced annual grass species cheatgrass (*Bromus tectorum*) has provided much of the herbaceous cover and has been considered to be a co-dominant site component in all years; perennial grasses were also co-dominant in 2025 (Table 10-01.7, Table 10-01.10). With the high abundance of cheatgrass, there remains a high risk of reduced ecological resiliency and potential for catastrophic fire that could endanger the beneficial browse overstory.

This site's condition as mule deer winter range has ranged between very poor and poor-fair since 1995; winter range condition was considered to be poor-fair in 2025. Factors that negatively influence condition as deer winter range include a lack of recruitment of young in the preferred browse community; preferred browse decadence; and a lack of perennial forb cover (Table 10-01.6, Table 10-01.7, Table 10-01.13, Table 10-01.15). According to pellet transect data, deer presence (although variable) has steadily increased over the course of the study and was at its highest in 2025. During the 2024/25 winter season the area had scattered occurrences of collared mule deer and elk (Wildlife Migration Initiative). The highest percentages of black sagebrush utilization correlate with years of higher deer presence, and fourwing saltbush utilization has remained moderate to high since 2005 (Table 10-01.9, Table 10-01.13). On-site observations in 2025 noted light utilization (10-20%) on crested wheatgrass (*Agropyron cristatum*) while little to no utilization was observed on forb species.

## Trend Summary Tables

**Table 10-01.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 14.5 | 0.1 | - | - | - | - |
| 2000 | 12.0 | 1.0 | 0.0 | - | - | - |
| 2005 | 9.5 | 0.1 | - | 9.6 | 0.1 | - |
| 2010 | 10.3 | 0.8 | 0.0 | 13.5 | 1.2 | - |
| 2015 | 8.5 | 0.5 | 0.0 | 13.3 | 1.2 | - |
| 2020 | 16.1 | 0.4 | 0.1 | 18.8 | 0.2 | - |
| 2025 | 16.4 | 0.4 | 0.0 | 20.4 | 0.6 | 0.2 |

**Table 10-01.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 471 | 180 | 73 | 58 | 51.5 | 3.8 | 0.5 | 0.6 |
| 2000 | 369 | 170 | 10 | 20 | 21.9 | 8.0 | 0.1 | 0.2 |
| 2005 | 426 | 197 | 97 | 39 | 48.7 | 3.8 | 1.0 | 0.8 |
| 2010 | 415 | 189 | 128 | 40 | 44.6 | 4.8 | 1.2 | 0.4 |
| 2015 | 427 | 168 | 55 | 59 | 41.6 | 5.5 | 0.6 | 1.1 |
| 2020 | 381 | 152 | 78 | 67 | 31.5 | 3.5 | 2.4 | 2.1 |
| 2025 | 266 | 254 | 73 | 70 | 17.6 | 13.0 | 1.3 | 0.7 |

**Table 10-01.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 8.8 | 0.4 | 62.2 | 3.4 | 1.1 | 65.6 |
| 2000 | 12.5 | 1.2 | 60.3 | 3.7 | 0.3 | 46.5 |
| 2005 | 17.8 | 0.1 | 25.0 | 8.0 | 0.8 | 58.6 |
| 2010 | 6.9 | 0.0 | 63.6 | 5.2 | 0.0 | 62.9 |
| 2015 | 12.8 | 0.2 | 56.5 | 4.3 | 0.8 | 54.5 |
| 2020 | 12.9 | 0.2 | 63.7 | 5.5 | 0.3 | 47.6 |
| 2025 | 12.8 | 0.0 | 55.4 | 10.2 | 0.3 | 44.9 |

**Table 10-01.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 6 | 9 | 2 | - | 6 |
| 2000 | 3 | 8 | 11 | - | 21 |
| 2005 | 4 | 36 | 14 | - | 48 |
| 2010 | 6 | 26 | 8 | - | 21 |
| 2015 | 3 | 27 | 1 | - | 28 |
| 2020 | 10 | 33 | - | 1 | 24 |
| 2025 | - | 38 | 6 | 3 | 17 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 22.5 (55.6) | 27.5 (67.9) | 28.1 (69.5) | 0.6 (1.4) | - |
| 2005 | 9.4 (23.3) | 52.3 (129.1) | 10.0 (24.8) | - | - |
| 2010 | 12.3 (30.5) | 67.7 (167.2) | 8.1 (19.9) | - | - |
| 2015 | 2.2 (5.4) | 47.6 (117.5) | - | 5.8 (14.3) | - |
| 2020 | 16.7 (41.2) | 99.2 (245.0) | - | - | - |
| 2025 | 2.9 (7.2) | 109.9 (271.5) | 0.7 (1.7) | 0.6 (1.4) | - |

**Table 10-01.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 12 | - | 30 | 471 | 12 | 1 | 47 | 16 | - | - | - | 101 |
| 2000 | 4 | - | 29 | 369 | 7 | - | 96 | 15 | - | - | - | 39 |
| 2005 | 7 | - | 41 | 426 | 15 | - | 97 | 4 | - | - | - | 54 |
| 2010 | 8 | - | 53 | 415 | 3 | - | 78 | 17 | - | - | - | 68 |
| 2015 | 8 | - | 34 | 427 | 14 | 8 | 88 | 2 | - | - | - | 38 |
| 2020 | 11 | 5 | 35 | 381 | 18 | - | 64 | 1 | 3 | - | - | 47 |
| 2025 | 13 | 13 | 52 | 266 | 16 | - | 98 | - | 4 | 1 | 3 | 105 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.1 | - | 1.0 | 51.5 | 0.1 | 0.0 | 1.3 | 0.2 | - | - | - | 1.0 |
| 2000 | 0.0 | - | 0.8 | 21.9 | 0.2 | - | 6.3 | 0.1 | - | - | - | 0.7 |
| 2005 | 0.1 | - | 1.2 | 48.7 | 0.2 | - | 1.9 | 0.1 | - | - | - | 0.3 |
| 2010 | 0.1 | - | 2.3 | 44.6 | 0.0 | - | 1.1 | 0.2 | - | - | - | 1.1 |
| 2015 | 0.0 | - | 0.8 | 41.6 | 0.2 | 0.3 | 3.3 | 0.0 | - | - | - | 0.8 |
| 2020 | 0.2 | 0.2 | 0.3 | 31.5 | 0.1 | - | 1.9 | 0.0 | 0.0 | - | - | 0.8 |
| 2025 | 0.4 | 0.3 | 1.6 | 17.6 | 0.7 | - | 5.0 | - | 0.0 | 0.1 | 0.1 | 4.8 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-01.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Astragalus (milkvetch) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera grindelioides (rayless tansyaster) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 1 | - | - | - | - | 5 | 4 | - | 64 | - | - | 6 | - | 51 | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | 5 | - | - | 1 | - | 19 | - | 5 |
| 2005 | - | - | - | - | 4 | - | 14 | 1 | - | 87 | - | - | 6 | - | 32 | - | - |
| 2010 | - | - | - | - | 10 | - | 4 | - | - | 128 | - | - | 6 | - | 24 | - | 1 |
| 2015 | - | - | - | 1 | 1 | - | - | - | 1 | 48 | - | 1 | 7 | - | 52 | 1 | 6 |
| 2020 | - | 2 | 11 | - | 2 | 3 | 7 | - | - | 54 | 3 | - | 6 | 13 | 51 | 4 | 11 |
| 2025 | 13 | - | 13 | - | 6 | - | 2 | - | - | 57 | - | - | 2 | - | 63 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | - | - | - | 0.0 | 0.0 | - | 0.5 | - | - | 0.0 | - | 0.6 | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | 0.1 | - | - | 0.0 | - | 0.2 | - | 0.1 |
| 2005 | - | - | - | - | 0.0 | - | 0.1 | 0.0 | - | 0.9 | - | - | 0.0 | - | 0.8 | - | - |
| 2010 | - | - | - | - | 0.1 | - | 0.0 | - | - | 1.2 | - | - | 0.0 | - | 0.3 | - | 0.0 |
| 2015 | - | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.5 | - | 0.0 | 0.2 | - | 0.8 | 0.0 | 0.1 |
| 2020 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.2 | - | - | 1.8 | 0.0 | - | 0.2 | 0.2 | 1.7 | 0.2 | 0.2 |
| 2025 | 0.3 | - | 0.1 | - | 0.0 | - | 0.0 | - | - | 0.9 | - | - | 0.0 | - | 0.7 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-01.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | - | 3.4 | - | 5.9 | 0.1 | - | 0.3 | - |
| 2010 | 0.2 | 3.6 | - | 9.3 | 1.2 | - | 0.4 | - |
| 2015 | 0.1 | 2.8 | - | 10.2 | 1.2 | - | 0.2 | - |
| 2020 | 0.1 | 2.6 | - | 15.6 | 0.2 | - | 0.5 | - |
| 2025 | 0.6 | 1.9 | - | 16.3 | 0.6 | - | 1.6 | 0.2 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | 1.4 | 2.3 | 0.0 | 7.8 | 0.1 | - | 3.1 | - |
| 2000 | 0.1 | 2.5 | - | 7.5 | 1.0 | - | 1.9 | 0.0 |
| 2005 | 0.0 | 3.1 | - | 5.2 | 0.1 | - | 1.2 | - |
| 2010 | 0.3 | 2.1 | - | 6.8 | 0.8 | - | 1.0 | 0.0 |
| 2015 | 0.4 | 2.0 | - | 5.4 | 0.5 | - | 0.6 | 0.0 |
| 2020 | 0.2 | 2.8 | - | 12.2 | 0.4 | - | 0.8 | 0.1 |
| 2025 | 0.6 | 1.9 | - | 12.9 | 0.4 | 0.0 | 1.0 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-01.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 6000 | 520 | 16 | 84 | 0 | 0 | 0 | 0 | 35/18 |
| 2000 | 420 | 160 | 19 | 81 | 0 | 33 | 5 | 0 | 11/12 |
| 2005 | 300 | - | 40 | 60 | 0 | 27 | 7 | 0 | 14/14 |
| 2010 | 760 | - | 3 | 97 | 0 | 0 | 0 | 0 | 15/18 |
| 2015 | 780 | 100 | 0 | 100 | 0 | 31 | 0 | 0 | 17/18 |
| 2020 | 420 | 20 | 24 | 62 | 14 | 10 | 0 | 14 | 12/17 |
| 2025 | 1440 | - | 35 | 65 | 0 | 35 | 0 | 0 | - / - |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 960 | 80 | 13 | 69 | 19 | 31 | 52 | 0 | 27/47 |
| 2000 | 820 | - | 5 | 61 | 34 | 15 | 0 | 22 | 26/58 |
| 2005 | 780 | - | 5 | 59 | 36 | 44 | 5 | 28 | 23/63 |
| 2010 | 1080 | - | 2 | 78 | 20 | 9 | 7 | 20 | 19/56 |
| 2015 | 840 | - | 7 | 79 | 14 | 7 | 93 | 5 | 20/56 |
| 2020 | 1000 | 20 | 6 | 86 | 8 | 8 | 92 | 6 | 24/51 |
| 2025 | 920 | - | 0 | 41 | 59 | 0 | 100 | 59 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 40 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | 103/175 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 39/41 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 75/153 |
| 2010 | - | - | - | - | - | - | - | - | 79/187 |
| 2015 | - | - | - | - | - | - | - | - | 59/106 |
| 2020 | - | - | - | - | - | - | - | - | 74/122 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 2180 | 320 | 57 | 40 | 3 | 1 | 0 | 0 | 91/106 |
| 2000 | 1780 | - | 19 | 66 | 15 | 14 | 1 | 8 | 82/108 |
| 2005 | 2100 | 40 | 16 | 54 | 30 | 31 | 51 | 18 | 74/87 |
| 2010 | 1480 | 160 | 16 | 64 | 20 | 61 | 3 | 16 | 81/112 |
| 2015 | 1680 | - | 11 | 77 | 12 | 38 | 39 | 14 | 67/108 |
| 2020 | 1600 | - | 4 | 70 | 26 | 38 | 10 | 16 | 83/104 |
| 2025 | 1820 | - | 11 | 60 | 29 | 32 | 37 | 33 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 380 | 20 | 16 | 84 | 0 | 0 | 0 | 0 | 25/14 |
| 2000 | 1440 | - | 4 | 85 | 11 | 0 | 0 | 15 | 15/23 |
| 2005 | 680 | 60 | 38 | 62 | 0 | 0 | 0 | 0 | 16/18 |
| 2010 | 2880 | 240 | 4 | 95 | 1 | 0 | 0 | 1 | 15/19 |
| 2015 | 1340 | 2100 | 15 | 85 | 0 | 0 | 0 | 0 | 15/18 |
| 2020 | 1080 | 200 | 26 | 57 | 17 | 0 | 0 | 22 | 21/11 |
| 2025 | 1480 | - | 7 | 78 | 15 | 0 | 0 | 14 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 6240 | 100 | 8 | 91 | 1 | 0 | 0 | 1 | 33/24 |
| 2000 | 3980 | 120 | 5 | 91 | 4 | 62 | 3 | 3 | 26/27 |
| 2005 | 2820 | - | 6 | 91 | 4 | 15 | 78 | 3 | 21/20 |
| 2010 | 1180 | - | 17 | 80 | 3 | 7 | 2 | 5 | 25/25 |
| 2015 | 580 | 20 | 24 | 62 | 14 | 17 | 38 | 14 | 21/23 |
| 2020 | 640 | - | 19 | 81 | 0 | 38 | 16 | 0 | 26/24 |
| 2025 | 1240 | - | 21 | 79 | 0 | 40 | 18 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 50 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

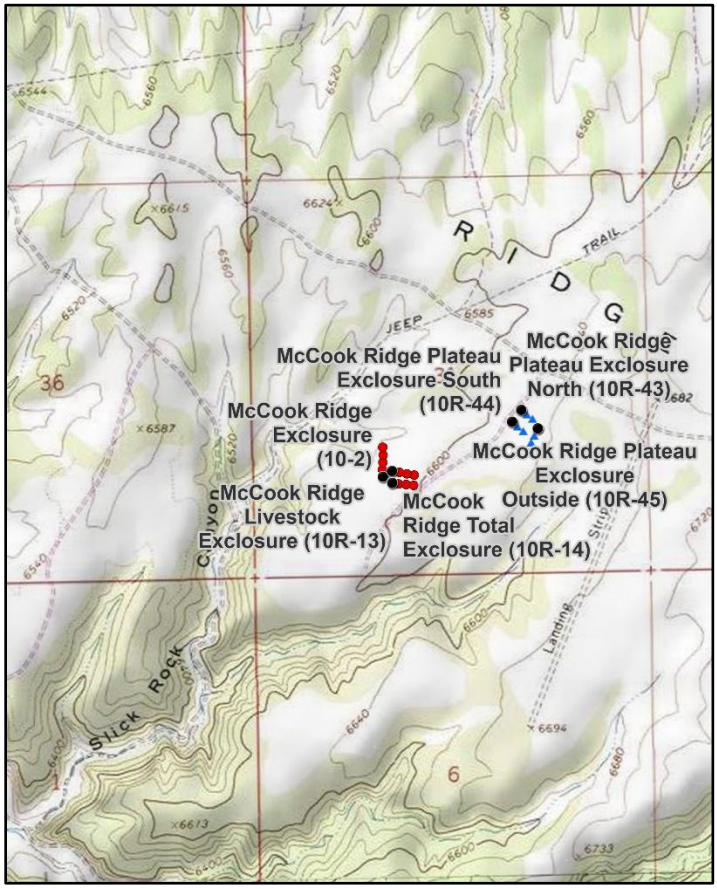
**Table 10-01.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

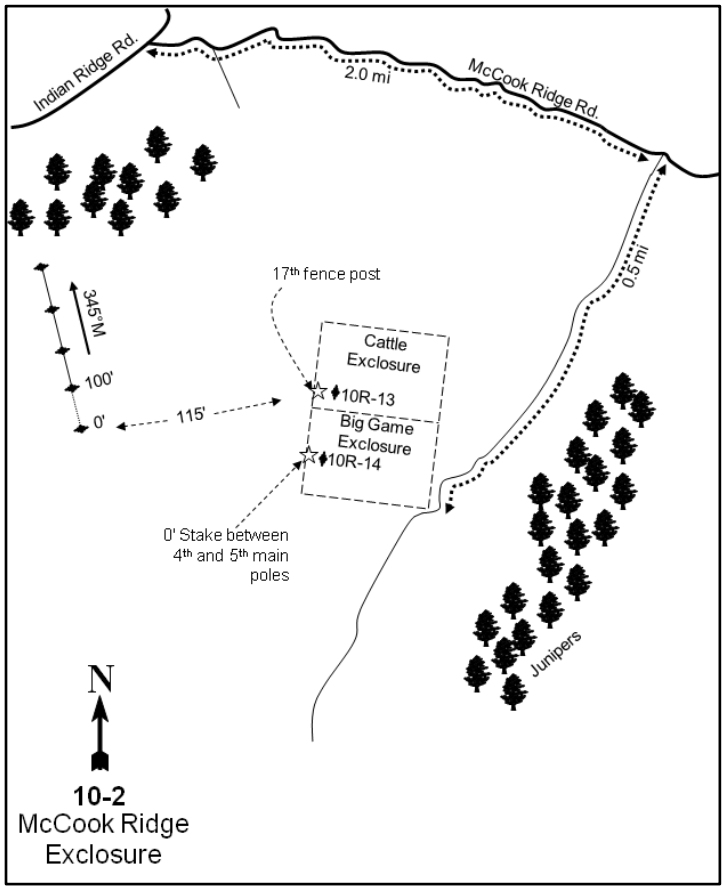
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 2 | - | 100 | - | - | - | 3.0 |
| 2025 | 1 | - | 100 | - | - | - | 2.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 4 | 33 | 67 | - | - | - | 1.3 |
| 2025 | 3 | - | 67 | - | 33 | - | 5.7 |

**Table 10-01.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 17.8 | 13.7 | 15.0 | 7.5 | -20.0 | 1.3 | 0.0 | **35.3** | Very Poor-Poor |
| 2000 | 15.0 | 9.9 | 7.0 | 16.0 | -16.4 | 0.5 | 0.0 | **32.0** | Very Poor |
| 2005 | 12.0 | 5.7 | 6.0 | 7.5 | -20.0 | 1.7 | 0.0 | **12.9** | Very Poor |
| 2010 | 16.8 | 9.1 | 6.1 | 9.6 | -20.0 | 0.9 | 0.0 | **22.5** | Very Poor |
| 2015 | 16.6 | 11.4 | 5.0 | 10.9 | -20.0 | 2.1 | 0.0 | **26.0** | Very Poor |
| 2020 | 23.5 | 8.1 | 2.3 | 7.0 | -20.0 | 4.2 | 0.0 | **25.1** | Very Poor |
| 2025 | 25.4 | 6.5 | 5.7 | 26.1 | -13.2 | 1.5 | 0.0 | **52.0** | Poor-Fair |

# MCCOOK RIDGE EXCLOSURE - STUDY NO. 10-2




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cooper Canyon SE; Township 13S, Range 24E, Section 31 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 647937 East 4389176 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 345° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 3: No Rebar; Line 4: 80ft long |

## Directions to Site

From Ouray, go 38 miles south to the McCook Ridge-Indian Ridge turn off. Turn left (east) and travel on Indian Ridge Road 9.1 miles toward Sweetwater Canyon and McCook Ridge to the intersection of Copper Canyon, Indian Ridge, and McCook Ridge. From Indian Ridge Road, turn southeast and proceed up McCook Ridge approximately 2 miles to a road on the right (a large exclosure can be seen off of the south side of the road). Turn right and drive approximately 0.5 miles to the exclosure. From the northwest side of the deer fence on the lower McCook Ridge Exclosure, the 0-foot baseline stake is approximately 40 paces away at a bearing of 263 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | LOWER MCCOOK |
| Elevation | 6,600ft (2,012m) |
| Aspect | Northwest |
| Slope | 4% |
| Sample Dates | 06/27/1995, 06/12/1997, 06/07/2000, 06/07/2005, 06/08/2010, 06/08/2015, 06/03/2020, 06/25/2025 |

**Table 10-02.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Seep Ridge Maintenance Lop & Scatter | 5517 | September-October 2021 | 3814 |
| Fencing - Exclosure | - | - | 1960s | - |
| Fencing - Exclosure | Book Cliffs Three-Way Exclosure Reconstruction | 1734 | August 2010-June 2011 | - |
| Seeding - Drill | McCook Ridge Cheatgrass Control | 1109 | September 2009 | 400 |

**Table 10-02.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| McCook Ridge Cheatgrass Control | | | Drill | Sep 2009 | 400 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Rimrock | 1.00 | 0.92 |
| G | Agropyron cristatum | Crested Wheatgrass | Douglas | 1.00 | 0.78 |
| G | Agropyron cristatum | Crested Wheatgrass | Hycrest | 1.00 | 0.91 |
| G | Elymus elymoides | Bottlebrush Squirreltail | Toe Jam | 0.05 | 0.04 |
| G | Elymus elymoides | Bottlebrush Squirreltail | Toe Jam | 0.45 | 0.39 |
| G | Elymus lanceolatus | Thickspike Wheatgrass | Critana | 1.00 | 0.87 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Secar | 1.00 | 0.76 |
| G | Poa secunda | Canby Bluegrass | Canbar | 0.25 | 0.21 |
| G | Psathyrostachys juncea | Russian Wildrye | Bozoisky | 1.00 | 0.85 |
| F | Linum perenne | Blue Flax | Appar | 0.25 | 0.21 |
| F | Medicago sativa | Alfalfa | Ladak | 1.50 | 1.36 |
| F | Sphaeralcea coccinea | Scarlet Globemallow | Duchesne/Uintah UT | 0.05 | 0.04 |
| S | Atriplex canescens | Fourwing Saltbush | Central UT | 1.00 | 0.43 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| McCook Ridge Cheatgrass Control-Sagebrush/Kochia | | | Aerial | Oct 2009 | 400 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Beaver UT | 0.50 | 0.08 |
| S | Bassia prostrata | Forage Kochia | Immigrant | 1.00 | 0.70 |

## Wildlife Habitat and Vegetation History

**Table 10-02.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10-02.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Wyoming Big Sagebrush | No Encroachment |
| 1988 | Wyoming Big Sagebrush | No Encroachment |
| 1995 | Wyoming Big Sagebrush | No Encroachment |
| 1997 | Wyoming Big Sagebrush | No Encroachment |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush | Early Phase I |
| 2010 | Wyoming Big Sagebrush | Early Phase I |
| 2015 | Wyoming Big Sagebrush | Early Phase I |
| 2020 | Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-02.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.6 | 35.0 | 38.8 | 26.2 | 1.9 | 5.5 | 185.6 | 0.5 | 06/12/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Upland Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY306UT |
| States and Transitions | 1982-1988 - Current Potential State: Community Phase 2.1<br>1995-2020 - Current Potential State: Community Phase 2.2<br>2025 - Current Potential State: Community Phase 2.1 |

Since establishment in 1982, the vegetation on this site has remained in a stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) as the dominant community component (Photos, Pre-1992 Data, Table 10-02.12, Table 10-02.13). The herbaceous understory has lacked diversity throughout the study period and forbs have consistently remained rare. The annual grass cheatgrass (*Bromus tectorum*) has varied in abundance each sample year and was the dominant understory species in most sample years. However, mainly native perennial grasses such as thickspike wheatgrass (*Elymus lanceolatus*), Sandberg bluegrass (*Poa secunda*), and Indian ricegrass (*Achnatherum hymenoides*) provided most of the herbaceous cover in 2025 (Table 10-02.10, Table 10-02.11). Barring wildfire or another shrub-removing disturbance, this site will likely continue to remain in this or a similar state in future sample years, although flushes of cheatgrass may occur.

This site's condition as mule deer winter range has ranged between very poor and fair-good since 1995; winter range condition was considered to be fair in 2025. Factors that negatively influence condition as deer winter range include reduced preferred browse cover and a lack of perennial forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 10-02.6, Table 10-02.7, Table 10-02.15). According to pellet transect data, deer presence has been variable over the course of the study and has ranged from low to high; deer presence was at its highest in 2005. During the 2024/25 winter season the area had scattered occurrences of collared elk and nearby collared mule deer (Wildlife Migration Initiative). The highest percentages of Wyoming sagebrush, winterfat (*Krascheninnikovia lanata*), and fourwing saltbush (*Atriplex canescens*) utilization correlate with higher deer presence in 2005 (Table 10-02.9, Table 10-02.13). On-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 10-02.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 19.6 | 1.6 | - | - | - | - |
| 1997 | 14.8 | 0.4 | - | - | - | - |
| 2000 | 23.1 | 1.0 | - | - | - | - |
| 2005 | 14.3 | 0.3 | - | 14.2 | 0.1 | - |
| 2010 | 16.2 | 3.0 | - | 15.8 | 1.8 | - |
| 2015 | 16.5 | 2.9 | - | 18.6 | 3.6 | - |
| 2020 | 13.8 | 0.2 | - | 14.9 | 0.1 | - |
| 2025 | 14.4 | 0.7 | - | 18.3 | 0.6 | - |

**Table 10-02.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 350 | 164 | 96 | 159 | 15.8 | 2.8 | 0.7 | 1.1 |
| 1997 | 319 | 173 | 52 | 149 | 5.4 | 2.3 | 0.4 | 1.4 |
| 2000 | 198 | 217 | 45 | 156 | 4.2 | 7.9 | 0.4 | 2.5 |
| 2005 | 229 | 188 | 129 | 105 | 13.6 | 3.5 | 1.8 | 1.0 |
| 2010 | 166 | 163 | 138 | 128 | 4.9 | 4.0 | 0.6 | 2.1 |
| 2015 | 298 | 181 | 7 | 164 | 13.1 | 6.2 | 0.2 | 2.1 |
| 2020 | 187 | 162 | 63 | 125 | 10.4 | 5.3 | 0.5 | 1.3 |
| 2025 | 57 | 167 | 39 | 83 | 0.5 | 6.7 | 0.3 | 0.5 |

**Table 10-02.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 26.1 | 3.9 | 39.7 | 3.3 | 1.5 | 41.3 |
| 1997 | 24.9 | 4.9 | 24.8 | 18.1 | 0.6 | 23.6 |
| 2000 | 34.9 | 3.1 | 38.2 | 3.5 | 0.2 | 39.6 |
| 2005 | 50.1 | 4.7 | 20.4 | 3.1 | 0.2 | 34.3 |
| 2010 | 39.3 | 1.3 | 38.1 | 3.3 | 0.1 | 32.5 |
| 2015 | 25.9 | 0.9 | 39.2 | 9.6 | 0.7 | 41.3 |
| 2020 | 23.7 | 2.2 | 49.1 | 15.8 | 0.5 | 29.5 |
| 2025 | 49.3 | 2.0 | 28.8 | 13.2 | 0.5 | 19.7 |

**Table 10-02.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 17 | 18 | 11 |
| 1997 | 1 | 21 | 26 | 3 |
| 2000 | - | 18 | 24 | 15 |
| 2005 | 4 | 37 | 26 | 68 |
| 2010 | 1 | 34 | 6 | 19 |
| 2015 | - | 25 | 15 | 24 |
| 2020 | 1 | 32 | 13 | 16 |
| 2025 | - | 41 | 10 | 4 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 1997 | - | - | - | - |
| 2000 | 0.7 (1.8) | 26.2 (64.6) | 27.5 (67.9) | - |
| 2005 | 7.2 (17.9) | 85.8 (211.9) | 14.7 (36.4) | - |
| 2010 | - | 19.4 (48.0) | 18.7 (46.3) | - |
| 2015 | - | 30.2 (74.5) | 17.4 (43.0) | - |
| 2020 | 3.6 (9.0) | 48.3 (119.2) | 18.7 (46.3) | - |
| 2025 | - | 33.5 (82.8) | 6.0 (14.9) | - |

**Table 10-02.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus porteri (Porter brome) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Elymus wawawaiensis (Snake River wheatgrass) | Festuca idahoensis (Idaho fescue) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 7 | - | - | 350 | 55 | - | - | - | 121 | - | - | - |
| 1997 | 16 | - | - | 319 | 45 | - | - | - | 137 | - | - | - |
| 2000 | 11 | - | - | 198 | 123 | 5 | - | 1 | 133 | - | - | - |
| 2005 | 10 | - | - | 229 | 78 | 15 | - | - | 139 | - | - | - |
| 2010 | 15 | - | - | 166 | 37 | 30 | - | - | 110 | - | - | - |
| 2015 | 11 | 16 | 5 | 298 | 78 | 37 | 2 | 0 | 100 | - | - | - |
| 2020 | 19 | 33 | - | 187 | 16 | 36 | - | 1 | 102 | - | 2 | 4 |
| 2025 | 31 | 13 | - | 57 | 20 | 41 | - | - | 86 | 14 | 1 | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.2 | - | - | 15.8 | 0.5 | - | - | - | 2.0 | - | - | - |
| 1997 | 0.2 | - | - | 5.4 | 0.7 | - | - | - | 1.4 | - | - | - |
| 2000 | 0.6 | - | - | 4.2 | 2.5 | 0.4 | - | 0.0 | 4.4 | - | - | - |
| 2005 | 0.1 | - | - | 13.6 | 1.4 | 0.2 | - | - | 1.8 | - | - | - |
| 2010 | 0.4 | - | - | 4.9 | 0.6 | 0.9 | - | - | 2.0 | - | - | - |
| 2015 | 0.5 | 0.1 | 0.4 | 13.1 | 1.5 | 2.2 | 0.0 | 0.0 | 1.5 | - | - | - |
| 2020 | 0.3 | 1.1 | - | 10.4 | 0.5 | 1.2 | - | 0.0 | 2.1 | - | 0.0 | 0.0 |
| 2025 | 1.4 | 0.8 | - | 0.5 | 0.8 | 1.7 | - | - | 1.7 | 0.4 | 0.0 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-02.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium (onion) | Arabis (rockcress) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cymopterus (springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Penstemon (beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 2 | - | 2 | - | - | - | - | 2 | 32 | 11 | 1 | 41 | 58 | - | - | - | - |
| 1997 | - | - | - | - | - | - | - | 2 | 13 | - | - | 45 | 42 | - | - | - | 2 |
| 2000 | 2 | - | - | - | - | - | - | - | 0 | - | - | 33 | 23 | - | - | - | - |
| 2005 | - | - | - | - | 1 | 1 | 2 | - | 33 | 7 | - | - | 116 | - | - | - | - |
| 2010 | - | - | - | - | - | 5 | - | - | 6 | 1 | - | 11 | 138 | - | - | 9 | - |
| 2015 | - | 3 | - | - | - | - | - | - | 2 | - | - | 27 | 5 | - | - | - | - |
| 2020 | - | 6 | - | 20 | - | - | - | - | - | - | - | 23 | 45 | - | 2 | - | - |
| 2025 | - | - | - | 5 | - | - | 1 | - | 1 | - | - | 7 | 13 | 6 | 4 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.0 | - | - | - | - | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.3 | - | - | - | - |
| 1997 | - | - | - | - | - | - | - | 0.0 | 0.1 | - | - | 0.4 | 0.3 | - | - | - | 0.0 |
| 2000 | 0.0 | - | - | - | - | - | - | - | 0.0 | - | - | 0.3 | 0.2 | - | - | - | - |
| 2005 | - | - | - | - | 0.0 | 0.0 | 0.0 | - | 0.3 | 0.0 | - | - | 1.5 | - | - | - | - |
| 2010 | - | - | - | - | - | 0.0 | - | - | 0.0 | 0.0 | - | 0.4 | 0.5 | - | - | 0.0 | - |
| 2015 | - | 0.0 | - | - | - | - | - | - | 0.0 | - | - | 0.4 | 0.2 | - | - | - | - |
| 2020 | - | 0.0 | - | 0.3 | - | - | - | - | - | - | - | 0.3 | 0.2 | - | 0.0 | - | - |
| 2025 | - | - | - | 0.0 | - | - | 0.0 | - | 0.0 | - | - | 0.1 | 0.1 | 0.0 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | - | 27 | 6 | 107 | 2 |
| 1997 | - | 2 | - | 109 | - |
| 2000 | - | - | - | 132 | 22 |
| 2005 | - | - | - | 102 | - |
| 2010 | - | 12 | - | 103 | - |
| 2015 | - | 17 | - | 126 | - |
| 2020 | 5 | 3 | 2 | 97 | 0 |
| 2025 | 26 | 9 | - | 61 | - |
| year | Average Cover (%) | | | | |
| 1995 | - | 0.1 | 0.1 | 0.8 | 0.0 |
| 1997 | - | 0.0 | - | 1.0 | - |
| 2000 | - | - | - | 2.2 | 0.2 |
| 2005 | - | - | - | 1.0 | - |
| 2010 | - | 0.0 | - | 1.7 | - |
| 2015 | - | 0.0 | - | 1.7 | - |
| 2020 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| 2025 | 0.2 | 0.0 | - | 0.4 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-02.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 1995 | - | - | - | - | - | - |
| 1997 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2005 | 0.3 | 10.5 | 1 | - | 2.4 | 0.1 |
| 2010 | 3.1 | 9.7 | 0.9 | 1.8 | 2.1 | - |
| 2015 | 5.2 | 10.5 | 1.6 | 3.6 | 1.3 | - |
| 2020 | 0.2 | 11.8 | 0.9 | 0.1 | 2 | - |
| 2025 | 0.5 | 12.3 | 2.9 | 0.6 | 2.6 | - |
| year | Quadrat Cover (%) | | | | | |
| 1995 | 3.0 | 10.3 | 2.0 | 1.4 | 4.3 | 0.2 |
| 1997 | 2.9 | 9.1 | 0.7 | 0.4 | 2.1 | - |
| 2000 | 6.4 | 11.9 | 2.5 | 0.9 | 2.2 | 0.0 |
| 2005 | 0.5 | 10.6 | 1.0 | 0.3 | 2.3 | 0.0 |
| 2010 | 4.3 | 9.6 | 0.3 | 3.0 | 2.1 | - |
| 2015 | 4.7 | 9.6 | 0.9 | 2.9 | 1.3 | - |
| 2020 | 0.1 | 11.2 | 0.6 | 0.2 | 2.0 | - |
| 2025 | 1.0 | 8.8 | 1.2 | 0.6 | 3.3 | 0.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-02.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 9680 | 2520 | 31 | 69 | 0 | 1 | 1 | 0 | 30/22 |
| 1997 | 7900 | 80 | 14 | 86 | 0 | 0 | 0 | 0 | 25/22 |
| 2000 | 9800 | 8040 | 10 | 87 | 2 | 17 | 7 | 1 | 9/20 |
| 2005 | 2680 | 560 | 31 | 68 | 1 | 5 | 0 | 1 | 12/14 |
| 2010 | 7960 | 8360 | 25 | 74 | 2 | 0 | 0 | 2 | 14/21 |
| 2015 | 12140 | 420 | 20 | 80 | 0 | 22 | 2 | 0 | 19/20 |
| 2020 | 280 | 40 | 43 | 50 | 7 | 21 | 0 | 7 | 9/15 |
| 2025 | 2900 | 160 | 6 | 95 | 0 | 7 | 0 | 0 | - / - |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 3860 | 1720 | 31 | 57 | 11 | 53 | 3 | 3 | 61/91 |
| 1997 | 3040 | 160 | 14 | 66 | 20 | 55 | 9 | 4 | 55/67 |
| 2000 | 3980 | 20 | 32 | 43 | 26 | 26 | 13 | 9 | 54/85 |
| 2005 | 3500 | - | 5 | 59 | 35 | 41 | 37 | 24 | 61/80 |
| 2010 | 3940 | 480 | 32 | 46 | 22 | 10 | 26 | 23 | 54/82 |
| 2015 | 3940 | - | 35 | 44 | 22 | 37 | 46 | 24 | 44/70 |
| 2020 | 3280 | 20 | 16 | 62 | 23 | 34 | 17 | 28 | 50/74 |
| 2025 | 4460 | 1420 | 27 | 55 | 18 | 17 | 56 | 22 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 780 | 20 | 15 | 72 | 13 | 33 | 15 | 0 | 63/76 |
| 1997 | 240 | - | 8 | 50 | 42 | 8 | 8 | 17 | 71/68 |
| 2000 | 700 | - | 0 | 60 | 40 | 29 | 3 | 0 | 74/80 |
| 2005 | 640 | 20 | 6 | 28 | 66 | 28 | 56 | 25 | 51/87 |
| 2010 | 480 | - | 33 | 21 | 46 | 8 | 17 | 50 | 47/57 |
| 2015 | 560 | - | 25 | 18 | 57 | 29 | 43 | 50 | 70/90 |
| 2020 | 540 | - | 22 | 15 | 63 | 22 | 44 | 67 | 69/76 |
| 2025 | 700 | - | 9 | 80 | 11 | 17 | 60 | 14 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 3200 | 200 | 36 | 63 | 2 | 0 | 0 | 0 | 25/26 |
| 1997 | 1740 | - | 5 | 94 | 1 | 0 | 0 | 1 | 18/17 |
| 2000 | 3020 | 100 | 20 | 76 | 5 | 0 | 0 | 1 | 12/18 |
| 2005 | 740 | - | 11 | 89 | 0 | 3 | 0 | 0 | 16/17 |
| 2010 | 5060 | - | 52 | 47 | 1 | 0 | 0 | 1 | 16/20 |
| 2015 | 14500 | 1840 | 64 | 35 | 0 | 0 | 0 | 0 | 18/20 |
| 2020 | 800 | 20 | 23 | 53 | 25 | 5 | 0 | 20 | 10/11 |
| 2025 | 2620 | 260 | 12 | 89 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 10220 | - | 14 | 86 | 0 | 7 | 1 | 0 | 24/26 |
| 1997 | 7620 | - | 10 | 90 | 0 | 42 | 0 | 0 | 21/22 |
| 2000 | 7020 | 20 | 3 | 87 | 10 | 43 | 21 | 1 | 20/23 |
| 2005 | 8020 | 20 | 4 | 95 | 2 | 16 | 80 | 0 | 14/18 |
| 2010 | 4400 | - | 35 | 65 | 1 | 13 | 2 | 1 | 20/22 |
| 2015 | 3120 | 20 | 10 | 86 | 5 | 36 | 47 | 6 | 18/21 |
| 2020 | 5480 | 200 | 29 | 70 | 1 | 38 | 9 | 1 | 22/25 |
| 2025 | 6720 | 320 | 37 | 63 | 1 | 16 | 6 | 1 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/31 |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 100 | - | 20 | 60 | 20 | 20 | 0 | 0 | 8/26 |
| 2005 | 60 | - | 0 | 33 | 67 | 0 | 0 | 0 | 7/25 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/30 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/34 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

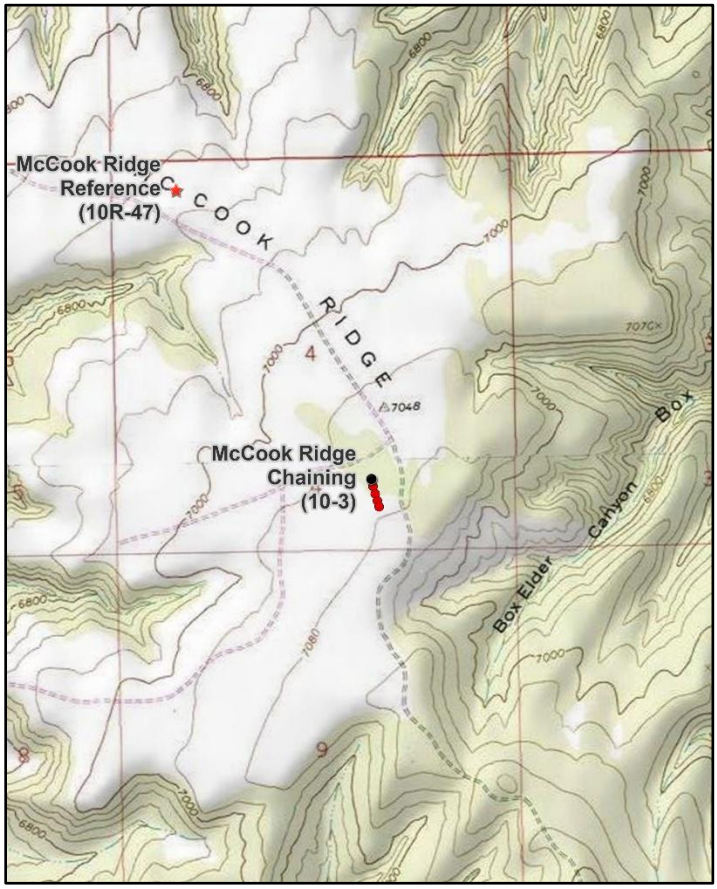
**Table 10-02.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

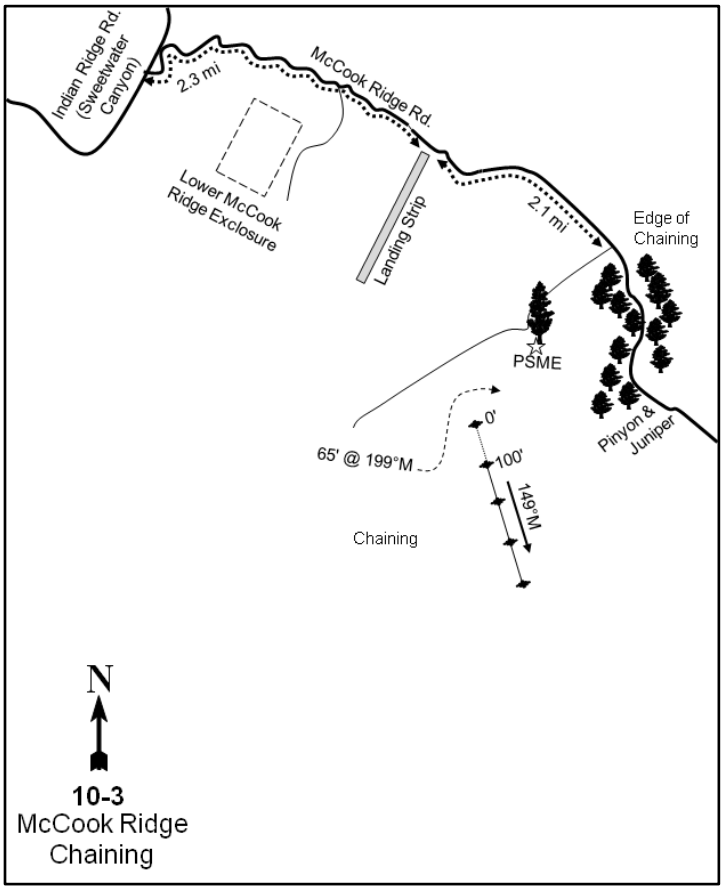
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 10 | - | 100 | - | - | - | 3.2 |
| 2025 | 10 | - | 100 | - | - | - | 3.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 9 | 40 | 60 | - | - | - | 3.0 |
| 2025 | 4 | - | 100 | - | - | - | 5.0 |

**Table 10-02.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 23.8 | 12.8 | 12.9 | 5.5 | -11.8 | 2.2 | 0.0 | **45.4** | Poor |
| 1997 | 17.8 | 10.7 | 6.5 | 4.6 | -4.1 | 2.8 | 0.0 | **38.3** | Poor |
| 2000 | 27.2 | 9.2 | 9.7 | 15.8 | -3.1 | 5.1 | 0.0 | **63.9** | Fair-Good |
| 2005 | 17.7 | 5.7 | 2.7 | 7.0 | -10.2 | 2.1 | 0.0 | **25.0** | Very Poor |
| 2010 | 19.0 | 10.0 | 15.0 | 8.0 | -3.7 | 4.2 | 0.0 | **52.5** | Fair |
| 2015 | 22.0 | 9.8 | 14.0 | 12.5 | -9.8 | 4.2 | 0.0 | **52.7** | Fair |
| 2020 | 18.6 | 8.5 | 9.2 | 10.7 | -7.8 | 2.6 | 0.0 | **41.8** | Poor |
| 2025 | 22.8 | 10.8 | 12.4 | 13.5 | -0.4 | 1.0 | 0.0 | **60.1** | Fair |

# McCook Ridge Chaining - Study No. 10-3




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tom Patterson Canyon; Township 14S, Range 24E, Section 04 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 651670 East 4387542 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9036 |
| Transect Bearing | 155° magnetic |
| Length | 40ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 3: No Rebar; Line 4: 80ft Long |

## Directions to Site

From the intersection of the Indian Ridge and McCook Ridge roads, go southeast on McCook Ridge for 2.3 miles to a landing strip on the right side of the road (just past the exclosure). Proceed an additiona1 2.1 miles up McCook Ridge into a chained area. Turn right off of the main road before the edge of the chaining, and proceed over to a large, lone Douglas fir (*Pseudotsuga menziesii*). The 0-foot baseline stake, marked by browse tag #9036, is 13 paces from the tree at a bearing of 199 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SWEET WATER |
| Elevation | 7,000ft (2,134m) |
| Aspect | West |
| Slope | 0-5% |
| Sample Dates | 06/27/1995, 06/07/2000, 06/07/2005, 07/16/2007, 07/15/2009, 06/08/2010, 06/03/2015, 06/02/2020, 06/10/2025 |

**Table 10-03.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Seep Ridge Maintenance Lop & Scatter | 5517 | September-October 2021 | 3814 |
| Chaining - One-Way Unknown | McCook Ridge Pinyon Juniper Chaining | - | Fall 1962 | 1907 |
| Seeding - Seed Unknown | McCook Ridge Pinyon Juniper Chaining | - | Fall 1962 | 2000 |
| Mechanical - Bullhog | McCook Ridge P/J Removal | 260 | April 2005 | 520 |

## Wildlife Habitat and Vegetation History

**Table 10-03.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10-03.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 1988 | Pinyon-Juniper/Perennial Grass | Phase I |
| 1995 | Pinyon-Juniper/Perennial Grass | Phase I |
| 2000 | Pinyon-Juniper/Perennial Grass | Phase I transitioning to Phase II |
| 2005 | Perennial Grass/Mixed Shrub | Early Phase I |
| 2007 | Perennial Grass/Mixed Shrub | Early Phase I |
| 2009 | Perennial Grass/Mixed Shrub | Early Phase I |
| 2010 | Perennial Grass/Mixed Shrub | Early Phase I |
| 2015 | Perennial Grass/Mixed Shrub | Early Phase I |
| 2020 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2025 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |

## Site Notes

Cattle were seen on the site in 2015.

## Soils

**Table 10-03.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.0 | 34.0 | 31.4 | 34.6 | 4.0 | 7.8 | 144.0 | 0.8 | 06/07/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1982 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1<br>1988-2000 - State Undefined: Community Phase Undefined<br>2005-2015 - Yellow Rabbitbrush State: Community Phase 4.1<br>2020-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Upon study establishment in 1986, the vegetation component on this site was dominated by a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and longflower rabbitbrush (*Chrysothamnus depressus*). Introduced perennial grass species made up the majority of the herbaceous understory (Photos, Pre-1992 Data, Table 10-03.7, Table 10-03.10, Table 10-03.12). Young twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees were scattered across the site; pinyon and juniper trees increased in abundance over time, as did mountain browse species (Table 10-03.13, Table 10-03.14). In 2005, a bullhog project removed many of the pinyon and juniper trees (Table 10-03.1). During the 2005 sample year, the site transitioned from a pinyon--juniper ecological type to one dominated by a mixture of seeded perennial grass species, longflower rabbitbrush, and mountain big sagebrush as a result of the bullhog treatment. Cover of longflower rabbitbrush decreased in 2020, leaving mountain big sagebrush as the dominant shrub species during the two most recent sample years (Table 10-03.6, Table 10-03.12, Table 10-03.13). Although an extant tree component is present as of 2025, density and cover of pinyon and juniper were further reduced between 2020 and 2025 by a lop and scatter project in 2021 (Table 10-03.1, Table 10-03.12, Table 10-03.14).

This site's condition as mule deer winter range has ranged between poor and good since 1995; winter range condition was considered

fair in 2025. Factors that negatively influence condition as deer winter range include a lack preferred browse cover and recruitment; preferred browse decadence; and a lack of perennial forb cover (Table 10-03.6, Table 10-03.7, Table 10-03.13, Table 10-03.15). According to pellet transect data, deer presence has been variable over the course of the study and has fluctuated between low and moderate. Deer presence was at its highest in 2009 while elk presence was at its highest in 2005. During the 2024/25 winter season the area had scattered occurrences of collared elk (Wildlife Migration Initiative). The years for highest combined utilization percentages for longflower rabbitbrush, mountain big sagebrush, and winterfat (*Krascheninnikovia lanata*) occur in asynchronous years and do not necessarily correlate with higher presence of wildlife (Table 10-03.9, Table 10-03.13). On-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 10-03.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 12.1 | 0.4 | 3.4 | - | - | - |
| 2000 | 12.8 | 0.5 | 5.0 | - | - | - |
| 2005 | 9.2 | 0.4 | 1.0 | 8.3 | 0.3 | 1.0 |
| 2007 | 9.2 | 0.3 | - | 11.1 | 1.4 | 0.2 |
| 2009 | 11.8 | 0.8 | 0.0 | 12.4 | 0.7 | 0.1 |
| 2010 | 12.4 | 0.2 | - | 12.3 | 0.5 | - |
| 2015 | 12.7 | 1.1 | - | 14.4 | 0.9 | 0.4 |
| 2020 | 12.3 | 0.7 | 0.4 | 10.8 | 0.4 | 0.8 |
| 2025 | 12.9 | 0.2 | - | 12.4 | 0.2 | - |

**Table 10-03.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 396 | 13 | 159 | - | 12.1 | 0.0 | 3.2 |
| 2000 | - | 384 | - | 94 | - | 14.4 | - | 1.4 |
| 2005 | - | 333 | 2 | 69 | - | 12.4 | 0.0 | 0.9 |
| 2007 | - | 370 | 1 | 95 | - | 22.6 | 0.0 | 0.7 |
| 2009 | - | 382 | - | 78 | - | 32.4 | - | 1.4 |
| 2010 | - | 380 | - | 73 | - | 29.5 | - | 1.8 |
| 2015 | - | 400 | 4 | 121 | - | 29.9 | 0.2 | 3.4 |
| 2020 | - | 376 | 0 | 90 | - | 27.1 | 0.0 | 1.7 |
| 2025 | - | 369 | - | 89 | - | 24.4 | - | 1.5 |

**Table 10-03.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 26.6 | 6.6 | 36.3 | 2.8 | 2.1 | 32.6 |
| 2000 | 36.9 | 5.8 | 34.1 | 1.1 | 1.5 | 34.3 |
| 2005 | 36.6 | 2.2 | 46.5 | 1.3 | 0.5 | 21.8 |
| 2007 | 31.6 | 0.7 | 44.7 | 1.2 | 1.0 | 33.2 |
| 2009 | 17.5 | 0.3 | 51.5 | 1.4 | 1.5 | 46.3 |
| 2010 | 18.8 | 0.5 | 56.8 | 0.8 | 0.8 | 45.0 |
| 2015 | 23.9 | 1.5 | 49.7 | 2.5 | 0.5 | 44.9 |
| 2020 | 30.3 | 2.7 | 43.3 | 1.8 | 1.4 | 39.0 |
| 2025 | 35.7 | 0.5 | 40.7 | 1.3 | 0.9 | 37.2 |

**Table 10-03.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 2 | 13 | 24 | - | 16 |
| 2000 | 1 | 6 | 5 | - | 33 |
| 2005 | 1 | 18 | 11 | - | 47 |
| 2007 | - | 18 | 18 | - | 62 |
| 2009 | 5 | 25 | 10 | - | 21 |
| 2010 | 4 | 18 | 6 | - | 13 |
| 2015 | 6 | 6 | 6 | 1 | 17 |
| 2020 | 8 | 6 | 9 | - | 11 |
| 2025 | - | 21 | 15 | - | 5 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | 24.8 (61.2) | 19.4 (48.0) | - | - |
| 2005 | 1.5 (3.6) | 24.1 (59.6) | 20.1 (49.7) | - | - |
| 2007 | 10.9 (26.9) | 32.2 (79.5) | 12.1 (29.8) | - | - |
| 2009 | 5.1 (12.6) | 32.8 (81.1) | 18.7 (46.3) | - | - |
| 2010 | 8.0 (19.7) | 8.7 (21.5) | 10.0 (24.8) | - | - |
| 2015 | 8.0 (19.7) | 6.0 (14.9) | 9.4 (23.2) | - | - |
| 2020 | 5.8 (14.3) | 14.7 (36.4) | 6.0 (14.9) | 0.6 (1.4) | - |
| 2025 | 1.5 (3.6) | 23.4 (57.9) | 10.0 (24.8) | - | - |

**Table 10-03.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus inermis[i] (smooth brome) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | 6 | 198 | 121 | 25 | 13 | 4 | 150 | 10 | 56 | - | 88 | 14 | 17 | 24 |
| 2000 | - | 233 | 97 | 3 | 3 | - | 117 | - | 32 | - | 78 | 3 | - | - |
| 2005 | 8 | 164 | 68 | - | 11 | 4 | 45 | 33 | 47 | - | 102 | 6 | 4 | 16 |
| 2007 | 12 | 183 | 120 | - | 10 | 2 | 63 | 59 | 61 | - | 50 | 33 | 9 | 28 |
| 2009 | 3 | 223 | 107 | 1 | - | - | 64 | 43 | 38 | - | 53 | - | 9 | 60 |
| 2010 | 2 | 199 | 88 | - | - | - | 113 | 23 | 48 | 14 | 90 | 2 | - | 27 |
| 2015 | 4 | 151 | 113 | - | 5 | - | 74 | 14 | 71 | 17 | 85 | 44 | 14 | 136 |
| 2020 | 7 | 208 | 93 | - | 3 | 2 | 136 | 0 | - | 21 | 78 | 23 | 5 | 46 |
| 2025 | - | 226 | 57 | - | 4 | - | 76 | - | 26 | 11 | 76 | 41 | - | 39 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | 0.1 | 6.4 | 1.3 | 0.3 | 0.4 | 0.0 | 0.6 | 0.0 | 0.5 | - | 2.0 | 0.3 | 0.2 | 0.2 |
| 2000 | - | 10.2 | 1.6 | 0.0 | 0.3 | - | 0.6 | - | 0.1 | - | 1.4 | 0.1 | - | - |
| 2005 | 0.2 | 5.6 | 1.5 | - | 0.1 | 0.1 | 0.4 | 0.7 | 0.8 | - | 2.4 | 0.3 | 0.0 | 0.2 |
| 2007 | 0.3 | 11.7 | 4.5 | - | 0.1 | 0.0 | 0.7 | 1.4 | 1.8 | - | 0.4 | 1.0 | 0.3 | 0.4 |
| 2009 | 0.3 | 19.0 | 5.1 | 0.0 | - | - | 2.1 | 1.4 | 2.1 | - | 1.1 | - | 0.5 | 0.8 |
| 2010 | 0.2 | 15.4 | 2.1 | - | - | - | 3.2 | 1.0 | 2.1 | 0.4 | 2.7 | 0.3 | - | 2.1 |
| 2015 | 0.0 | 10.2 | 2.3 | - | 0.2 | - | 3.3 | 0.3 | 2.1 | 0.5 | 2.0 | 4.1 | 0.5 | 4.3 |
| 2020 | 0.4 | 15.9 | 1.7 | - | 0.0 | 0.0 | 3.2 | 0.0 | - | 0.4 | 2.7 | 1.1 | 0.0 | 1.7 |
| 2025 | - | 18.8 | 0.8 | - | 0.0 | - | 0.9 | - | 0.7 | 0.1 | 1.0 | 1.3 | - | 0.7 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-03.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Antennaria dimorpha (low pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus spatulatus (tufted milkvetch) | Calochortus nuttallii (sego lily) | Castilleja (Indian paintbrush) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Crepis acuminata (tapertip hawksbeard) | Cymopterus (springparsley) | Delphinium (larkspur) | Erigeron (fleabane) | Erigeron pumilus (shaggy fleabane) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 31 | 27 | 4 | - | 6 | 23 | - | 6 | - | 2 | - | 3 | 2 | - |
| 2000 | - | - | - | 12 | 5 | 6 | 5 | - | - | - | - | - | - | 5 | 6 | - | - |
| 2005 | - | - | - | 20 | 2 | 12 | - | 2 | - | - | - | 6 | - | - | 1 | 2 | - |
| 2007 | - | - | - | 2 | 17 | 1 | - | - | - | - | - | - | - | - | 4 | - | 11 |
| 2009 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | 6 | 19 | - | - |
| 2010 | - | 3 | - | 18 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | - | - |
| 2015 | 10 | 2 | - | 22 | 16 | 2 | 9 | - | - | 2 | - | 2 | - | - | 4 | - | - |
| 2020 | 4 | - | - | 6 | 2 | 2 | - | - | 2 | - | - | - | - | - | 8 | 0 | - |
| 2025 | 5 | - | 3 | - | 6 | 6 | - | - | - | - | - | - | - | - | 8 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 0.2 | 0.1 | 0.0 | - | 0.0 | 0.1 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - |
| 2000 | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | - |
| 2005 | - | - | - | 0.1 | 0.0 | 0.0 | - | 0.0 | - | - | - | 0.0 | - | - | 0.0 | 0.0 | - |
| 2007 | - | - | - | 0.0 | 0.0 | 0.0 | - | - | - | - | - | - | - | - | 0.0 | - | 0.1 |
| 2009 | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | 0.1 | 0.1 | - | - |
| 2010 | - | 0.0 | - | 0.1 | 0.0 | 0.0 | - | 0.0 | - | - | - | - | - | - | - | - | - |
| 2015 | 0.8 | 0.0 | - | 0.1 | 0.1 | 0.0 | 0.2 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | - | - |
| 2020 | 0.2 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | 0.1 | 0.0 | - |
| 2025 | 0.1 | - | 0.0 | - | 0.0 | 0.0 | - | - | - | - | - | - | - | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Oenothera caespitosa (tufted evening primrose) | Orthocarpus[a] (owl's-clover) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon pachyphyllus (thickleaf beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Sphaeralcea coccinea (scarlet globemallow) | Stenotus acaulis (stemless mock goldenweed) | Streptanthus cordatus (heartleaf twistflower) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 13 | 16 | - | 4 | - | - | 3 | - | 43 | - | 7 | - | 29 | 9 | 1 | 6 | 13 |
| 2000 | 24 | 9 | 1 | - | - | - | - | - | 14 | 1 | - | - | 20 | 17 | - | - | 1 |
| 2005 | 8 | 5 | - | - | - | - | 4 | - | 2 | - | - | - | 18 | 8 | 1 | - | 3 |
| 2007 | 24 | 3 | - | - | - | - | 0 | - | 21 | 3 | - | 1 | 23 | 10 | - | - | - |
| 2009 | 32 | 0 | - | - | - | 0 | 2 | - | 8 | - | - | - | 24 | - | - | 1 | - |
| 2010 | 15 | 4 | - | - | - | - | - | - | 16 | - | - | - | 24 | 7 | - | - | 3 |
| 2015 | 38 | 6 | - | - | 4 | - | 4 | 7 | 16 | 1 | - | - | 21 | 1 | - | 3 | - |
| 2020 | 23 | 8 | - | - | - | - | - | - | 23 | - | - | - | 26 | - | - | 2 | 2 |
| 2025 | 23 | 9 | - | - | - | - | 4 | - | 20 | - | - | - | 26 | 10 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 1.2 | - | 0.0 | - | - | 0.0 | - | 0.1 | - | 0.0 | - | 0.1 | 0.3 | 0.0 | 0.0 | 0.8 |
| 2000 | 0.2 | 0.4 | 0.0 | - | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 | 0.5 | - | - | 0.0 |
| 2005 | 0.1 | 0.1 | - | - | - | - | 0.1 | - | 0.0 | - | - | - | 0.2 | 0.2 | 0.0 | - | 0.0 |
| 2007 | 0.2 | 0.0 | - | - | - | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.1 | 0.2 | - | - | - |
| 2009 | 0.9 | 0.1 | - | - | - | 0.0 | 0.0 | - | 0.0 | - | - | - | 0.2 | - | - | 0.0 | - |
| 2010 | 0.2 | 0.5 | - | - | - | - | - | - | 0.0 | - | - | - | 0.1 | 0.5 | - | - | 0.1 |
| 2015 | 1.3 | 0.3 | - | - | 0.0 | - | 0.0 | 0.2 | 0.1 | 0.0 | - | - | 0.1 | 0.0 | - | 0.1 | - |
| 2020 | 0.6 | 0.5 | - | - | - | - | - | - | 0.1 | - | - | - | 0.1 | - | - | 0.0 | 0.0 |
| 2025 | 0.4 | 0.5 | - | - | - | - | 0.0 | - | 0.1 | - | - | - | 0.1 | 0.2 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Tragopogon dubius[ai] (yellow salsify) | unknown perennial forb (unknown forb) |
|---|---|---|
| year | Nested | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | - | - |
| 2007 | - | - |
| 2009 | - | - |
| 2010 | - | 2 |
| 2015 | 2 | - |
| 2020 | - | - |
| 2025 | - | - |
| year | Average Cover (%) | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | - | - |
| 2007 | - | - |
| 2009 | - | - |
| 2010 | - | 0.1 |
| 2015 | 0.1 | - |
| 2020 | - | - |
| 2025 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-03.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. | Ericameria nauseosa (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Linanthus pungens (granite prickly phlox) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | - | 4.9 | 3.4 | - | - | - | - | 0.3 | 0.6 | - | - | - | - | 0.4 |
| 2007 | 0 | 0.9 | 5.3 | 4.9 | - | - | - | - | 1.4 | 0.1 | - | - | - | - | 0.1 |
| 2009 | - | - | 6.3 | 5.9 | 0.1 | - | 0.2 | - | 0.6 | 0.1 | - | - | - | - | - |
| 2010 | - | - | 6.3 | 5.8 | - | - | 0.2 | - | 0.5 | 0 | - | - | - | - | 0 |
| 2015 | - | - | 7.5 | 6.9 | - | - | - | - | 0.9 | 0.2 | - | - | - | - | 0.2 |
| 2020 | - | 0.2 | 7.5 | 3.1 | - | - | - | - | 0.4 | 0.7 | - | - | - | - | 0.1 |
| 2025 | - | 0.2 | 8.7 | 3.4 | - | 0.1 | - | - | 0.1 | - | 0.1 | - | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | |
| 1995 | - | - | 6.7 | 5.3 | - | - | - | - | 0.4 | 1.6 | 0.1 | - | 0.0 | - | 1.8 |
| 2000 | 0.1 | - | 7.7 | 4.9 | - | - | 0.0 | - | 0.4 | 1.1 | 0.0 | 0.1 | - | - | 3.8 |
| 2005 | 0.0 | - | 4.5 | 4.8 | - | - | 0.0 | - | 0.4 | 0.2 | - | - | - | - | 0.8 |
| 2007 | 0.0 | 0.3 | 4.2 | 4.6 | - | - | 0.0 | - | 0.3 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| 2009 | - | - | 5.0 | 6.7 | 0.0 | - | 0.0 | 0.0 | 0.8 | 0.0 | 0.1 | - | - | - | - |
| 2010 | 0.0 | - | 5.8 | 6.6 | - | - | 0.0 | - | 0.2 | 0.0 | - | - | - | 0.0 | 0.0 |
| 2015 | 0.1 | - | 6.8 | 5.6 | - | - | 0.1 | - | 1.1 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| 2020 | - | 0.1 | 6.4 | 5.8 | - | - | - | - | 0.7 | 0.4 | 0.0 | - | - | 0.0 | 0.0 |
| 2025 | - | 0.0 | 9.1 | 3.8 | - | 0.0 | - | - | 0.2 | - | 0.0 | - | 0.0 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-03.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/27 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/12 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/9 |
| 2007 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 16/16 |
| 2009 | - | - | - | - | - | - | - | - | 22/13 |
| 2010 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 10/16 |
| 2015 | 40 | - | 0 | 100 | 0 | 50 | 0 | 50 | 14/13 |
| 2020 | 60 | - | 0 | 100 | 0 | 100 | 0 | 0 | 11/18 |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | 140 | - | 14 | 71 | 14 | 0 | 0 | 14 | 30/42 |
| 2009 | - | - | - | - | - | - | - | - | 24/45 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 80 | - | 25 | 75 | 0 | 25 | 0 | 0 | 25/40 |
| 2025 | 140 | - | 0 | 100 | 0 | 14 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 3160 | 40 | 50 | 47 | 3 | 27 | 0 | 1 | 64/82 |
| 2000 | 2980 | - | 5 | 60 | 34 | 40 | 9 | 20 | 56/75 |
| 2005 | 2320 | - | 3 | 71 | 27 | 38 | 33 | 28 | 49/61 |
| 2007 | 2360 | - | 13 | 59 | 29 | 34 | 50 | 8 | 58/74 |
| 2009 | - | - | - | - | - | - | - | - | 49/62 |
| 2010 | 2380 | - | 23 | 61 | 17 | 68 | 24 | 13 | 50/68 |
| 2015 | 2120 | - | 6 | 76 | 18 | 18 | 72 | 15 | 52/72 |
| 2020 | 1740 | 80 | 22 | 72 | 6 | 35 | 2 | 8 | 60/82 |
| 2025 | 2360 | 60 | 3 | 93 | 4 | 59 | 2 | 4 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 65/62 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 13660 | 60 | 6 | 94 | 0 | 0 | 0 | 0 | 12/27 |
| 2000 | 15500 | - | 11 | 73 | 17 | 54 | 0 | 3 | 8/22 |
| 2005 | 11020 | - | 3 | 92 | 5 | 42 | 39 | 3 | 11/20 |
| 2007 | 11660 | 160 | 0 | 98 | 2 | 53 | 37 | 2 | 11/30 |
| 2009 | - | - | - | - | - | - | - | - | 11/26 |
| 2010 | 10700 | - | 12 | 88 | 0 | 0 | 0 | 0 | 11/25 |
| 2015 | 7980 | - | 0 | 99 | 1 | 2 | 63 | 1 | 11/27 |
| 2020 | 7280 | 20 | 5 | 88 | 8 | 50 | 47 | 7 | 9/23 |
| 2025 | 5460 | - | 0 | 96 | 4 | 14 | 0 | 4 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2009 | - | - | - | - | - | - | - | - | 22/21 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 35/103 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | 3/8 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | - | - | - | - | - | - | - | - | 70/73 |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 60 | 60 | 67 | 33 | 0 | 0 | 0 | 0 | 91/102 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 97/99 |
| 2005 | 40 | - | 50 | 0 | 50 | 50 | 0 | 50 | 50/26 |
| 2007 | 60 | - | 67 | 33 | 0 | 0 | 33 | 33 | 71/80 |
| 2009 | - | - | - | - | - | - | - | - | 72/76 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 61/77 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 66/75 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 81/114 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. speciosa[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | 88/72 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1480 | 40 | 23 | 77 | 0 | 0 | 0 | 0 | 19/18 |
| 2000 | 1380 | - | 26 | 65 | 9 | 0 | 0 | 1 | 11/13 |
| 2005 | 1120 | 40 | 13 | 88 | 0 | 0 | 0 | 0 | 15/17 |
| 2007 | 1800 | 40 | 2 | 98 | 0 | 1 | 0 | 1 | 16/18 |
| 2009 | - | - | - | - | - | - | - | - | 18/18 |
| 2010 | 1660 | - | 23 | 77 | 0 | 1 | 0 | 0 | 13/16 |
| 2015 | 2760 | 360 | 42 | 58 | 0 | 0 | 0 | 0 | 15/18 |
| 2020 | 2360 | 20 | 10 | 87 | 3 | 1 | 0 | 4 | 12/14 |
| 2025 | 820 | 80 | 15 | 73 | 12 | 0 | 0 | 24 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 140 | - | 71 | 29 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 80 | 20 | 75 | 0 | 25 | 0 | 0 | 25 | - / - |
| 2007 | 80 | - | 75 | 0 | 25 | 0 | 0 | 25 | - / - |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | 60 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 60 | 20 | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/19 |
| 2000 | 160 | - | 0 | 88 | 13 | 38 | 0 | 13 | 22/20 |
| 2005 | 100 | - | 20 | 60 | 20 | 20 | 60 | 20 | 13/16 |
| 2007 | 120 | - | 0 | 100 | 0 | 17 | 83 | 0 | 12/11 |
| 2009 | - | - | - | - | - | - | - | - | 15/15 |
| 2010 | 160 | - | 38 | 63 | 0 | 63 | 0 | 0 | 13/14 |
| 2015 | 60 | - | 0 | 100 | 0 | 33 | 33 | 0 | 17/19 |
| 2020 | 100 | - | 0 | 100 | 0 | 40 | 20 | 0 | 14/16 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/27 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/22 |
| 2007 | - | - | - | - | - | - | - | - | 11/25 |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 7/18 |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 50 | 7/27 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 10/35 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 9/30 |
| 2007 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | 9/17 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 8/20 |
| 2020 | - | - | - | - | - | - | - | - | 6/20 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 1/3 |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 2/5 |
| 2007 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | 2/5 |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2020 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | 40 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2007 | 80 | - | 50 | 25 | 25 | 0 | 0 | 25 | - / - |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 50 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Purshia stansburiana[p] -- (Stansbury cliffrose) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2007 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 32/57 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

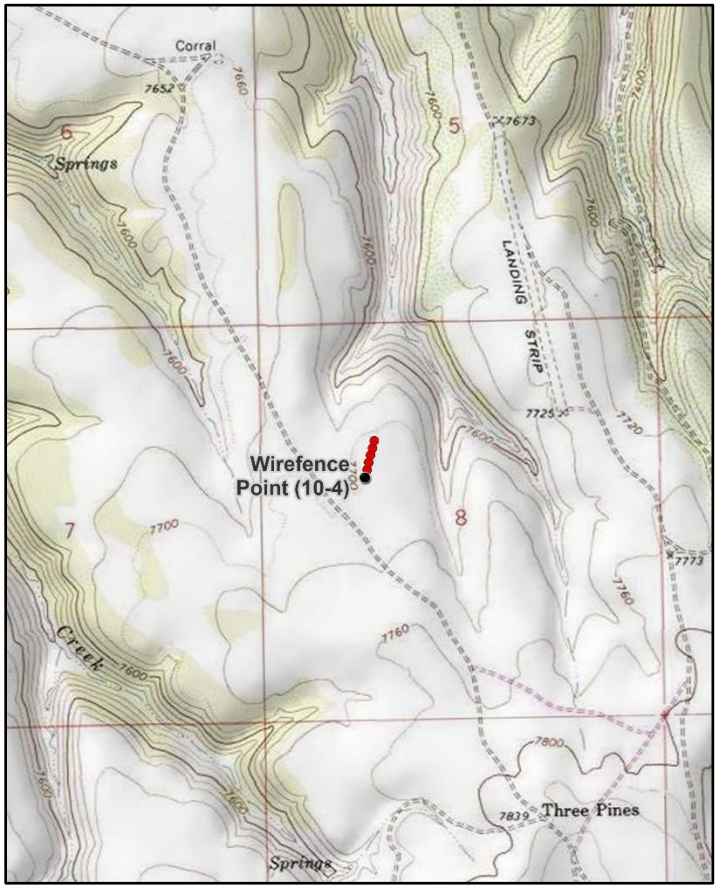
**Table 10-03.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

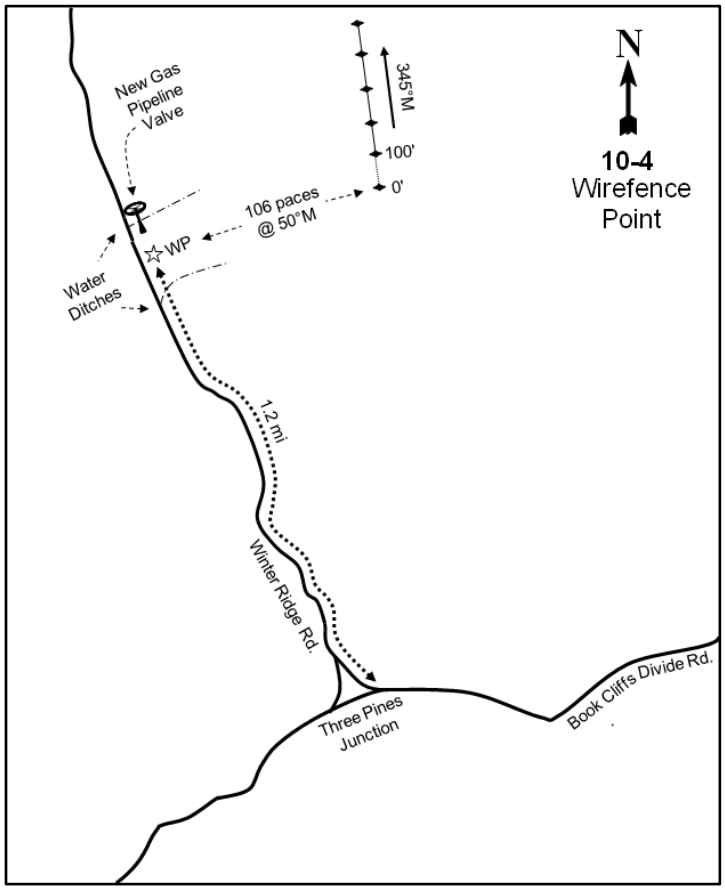
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 90 | - | - | - | - | - | 7.6 |
| 2000 | 147 | - | - | - | - | - | 6.3 |
| 2005 | 68 | 11 | 33 | 44 | 11 | - | 8.2 |
| 2007 | 54 | 57 | 29 | 7 | 7 | - | 3.3 |
| 2009 | 17 | 80 | 20 | - | - | - | 2.4 |
| 2010 | 40 | 38 | 62 | - | - | - | 1.9 |
| 2015 | 49 | 40 | 60 | - | - | - | 3.1 |
| 2020 | 66 | 53 | 33 | 13 | - | - | 3.2 |
| 2025 | 25 | - | 100 | - | - | - | 4.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 105 | - | - | - | - | - | 11.2 |
| 2000 | 126 | - | - | - | - | - | 10.7 |
| 2005 | 37 | 7 | 43 | 7 | 36 | 7 | 8.3 |
| 2007 | 19 | 100 | - | - | - | - | 1.0 |
| 2009 | 11 | 75 | 25 | - | - | - | 2.0 |
| 2010 | 8 | - | 100 | - | - | - | 2.8 |
| 2015 | 12 | 14 | 86 | - | - | - | 2.4 |
| 2020 | 14 | 29 | 57 | 14 | - | - | 3.4 |
| 2025 | 5 | 40 | 60 | - | - | - | 2.0 |

**Table 10-03.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 15.1 | 14.4 | 15.0 | 24.3 | 0.0 | 6.4 | 0.0 | **75.2** | Good |
| 2000 | 15.9 | 6.9 | 3.6 | 28.9 | 0.0 | 2.7 | 0.0 | **58.0** | Fair |
| 2005 | 10.4 | 9.6 | 1.4 | 24.7 | 0.0 | 1.8 | 0.0 | **47.9** | Poor |
| 2007 | 13.9 | 10.2 | 3.6 | 30.0 | 0.0 | 1.5 | 0.0 | **59.2** | Fair |
| 2009 | 15.5 | 0.0 | 0.0 | 30.0 | 0.0 | 2.9 | 0.0 | **48.4** | Poor |
| 2010 | 15.4 | 12.3 | 8.7 | 30.0 | 0.0 | 3.6 | 0.0 | **70.0** | Fair-Good |
| 2015 | 18.0 | 12.1 | 1.6 | 30.0 | 0.0 | 6.8 | 0.0 | **68.5** | Fair-Good |
| 2020 | 13.5 | 13.1 | 8.5 | 30.0 | 0.0 | 3.4 | 0.0 | **68.5** | Fair-Good |
| 2025 | 15.5 | 13.7 | 0.9 | 30.0 | 0.0 | 3.0 | 0.0 | **63.1** | Fair |

# WIREFENCE POINT - STUDY NO. 10-4




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cedar Camp Canyon SE; Township 16S, Range 23E, Section 08 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 636989 East 4365905 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 345° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Book Cliffs Divide road near Three Pines, turn right onto the Winter Ridge road. Travel 1.2 miles toward Winter Ridge to a witness post on the right (east) side of the road, where there may also be an old drainage ditch or faint fork. From the witness post, walk 106 paces at a bearing of 50 degrees magnetic to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | BOOKCLIFFS PASTURE |
| Elevation | 7,700ft (2,347m) |
| Aspect | Southwest |
| Slope | 2-5% |
| Sample Dates | 06/29/1995, 06/10/1997, 06/21/2000, 06/14/2005, 06/21/2010, 06/10/2015, 06/03/2020, 06/04/2025 |

**Table 10-04.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Willow Watershed Improvements FY2023 | 5934 | September 2022-June 2024 | 3791 |
| Herbicide - Herbicide Unknown | - | - | 1980s | - |
| Hand Crew - Lop and Scatter | Three Pines L and S | 1078 | September 2008-March 2009 | 1943 |

## Wildlife Habitat and Vegetation History

**Table 10-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 1997 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 6.7 | 31.8 | 32.4 | 35.8 | 2.4 | 6.9 | 124.8 | 0.5 | 06/10/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1982, the vegetation on this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant component (Photos, Pre-1992 Data, Table 10-04.12). The herbaceous understory has been diverse and has mostly consisted of perennial grass and forb species (Table 10-04.7, Table 10-04.10, Table 10-04.11). Point-quarter density of Rocky Mountain juniper (*Juniperus scopulorum*) increased between 1995 and 2020, but density decreased in 2025 following a lop and scatter treatment (Table 10-04.1). Although there remains an extant tree component as of the most recent sampling, further infilling is likely not an immediate concern: the site has remained within Early Phase I of woodland succession since study establishment (Table 10-04.4, Table 10-04.12, Table 10-04.14).

The abundant grass and forb communities on this site may provide forage for elk and deer during the summer months (Table 10-04.3, Table 10-04.6, Table 10-04.10, Table 10-04.11). Pellet transect data indicates that elk presence has ranged between low and moderate since 2000, but presence of mule deer has fluctuated between low and high over the same period. Deer presence was at its highest in 2025 (Table 10-04.9); on-site observations for that year note moderate (20-40%) utilization of perennial grasses and forbs.

## Trend Summary Tables

**Table 10-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 17.9 | 1.4 | 0.0 | - | - | - |
| 1997 | 14.2 | 0.5 | 0.6 | - | - | - |
| 2000 | 16.4 | 0.8 | 0.1 | - | - | - |
| 2005 | 22.6 | 1.3 | 0.1 | 29.7 | 1.3 | 0.5 |
| 2010 | 22.0 | 0.8 | - | 32.0 | 1.1 | - |
| 2015 | 24.5 | 0.7 | 0.4 | 26.9 | 2.4 | - |
| 2020 | 24.8 | 1.4 | 0.1 | 25.7 | 2.5 | 0.3 |
| 2025 | 22.2 | 0.7 | 0.1 | 29.7 | 0.9 | 0.3 |

**Table 10-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 403 | 167 | 400 | - | 8.9 | 0.6 | 18.1 |
| 1997 | - | 413 | 100 | 364 | - | 8.3 | 0.3 | 10.0 |
| 2000 | - | 371 | 26 | 357 | - | 9.0 | 0.1 | 15.3 |
| 2005 | - | 327 | 122 | 340 | - | 12.8 | 1.1 | 13.1 |
| 2010 | - | 326 | 106 | 312 | - | 8.3 | 0.5 | 11.4 |
| 2015 | - | 339 | 93 | 327 | - | 17.1 | 0.8 | 10.7 |
| 2020 | - | 347 | 203 | 322 | - | 11.5 | 2.3 | 13.5 |
| 2025 | - | 328 | 28 | 301 | - | 9.4 | 0.2 | 8.7 |

**Table 10-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 26.7 | 1.2 | 44.4 | 0.6 | 0.2 | 46.8 |
| 1997 | 18.3 | 2.0 | 33.0 | 2.6 | 0.1 | 37.8 |
| 2000 | 35.7 | 2.1 | 45.7 | 0.8 | 0.0 | 43.6 |
| 2005 | 41.9 | 1.2 | 28.6 | 0.2 | 0.0 | 41.8 |
| 2010 | 34.9 | 0.2 | 40.4 | 0.6 | - | 43.3 |
| 2015 | 36.3 | 2.2 | 38.0 | 0.9 | 0.1 | 46.8 |
| 2020 | 36.5 | 1.7 | 37.5 | 0.8 | 0.4 | 46.1 |
| 2025 | 51.0 | 0.3 | 34.9 | 0.3 | 0.1 | 37.7 |

**Table 10-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 4 | 18 | 4 | - | 1 |
| 1997 | 5 | 11 | 9 | - | 1 |
| 2000 | 1 | 21 | 13 | - | 19 |
| 2005 | - | 25 | 6 | 1 | 12 |
| 2010 | - | 20 | 10 | 1 | 5 |
| 2015 | 2 | 10 | 15 | 1 | 60 |
| 2020 | 4 | 10 | 6 | 1 | 4 |
| 2025 | 2 | 12 | 9 | - | 29 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 1997 | - | - | - | - | - |
| 2000 | 5.1 (12.6) | 32.8 (81.1) | 19.4 (48.0) | - | - |
| 2005 | 2.2 (5.4) | 20.8 (51.3) | 7.4 (18.2) | - | - |
| 2010 | 9.4 (23.3) | 22.1 (54.6) | 19.4 (48.0) | 1.7 (4.3) | - |
| 2015 | - | 2.0 (5.0) | 30.8 (76.1) | 0.6 (1.4) | - |
| 2020 | 8.7 (21.5) | 8.1 (19.9) | 12.8 (31.5) | - | - |
| 2025 | - | 54.9 (135.7) | 7.4 (18.2) | - | - |

**Table 10-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Carex (sedge) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | - | - | 23 | - | 47 | 195 | 198 | 92 | - | 161 |
| 1997 | - | 1 | 35 | - | 101 | 116 | 306 | 242 | 7 | 39 |
| 2000 | 1 | - | 33 | 2 | 42 | 188 | 82 | 211 | - | 97 |
| 2005 | 1 | - | 18 | 1 | 65 | 161 | 50 | 132 | 94 | 11 |
| 2010 | - | - | 38 | - | 91 | 94 | 89 | 71 | 87 | 22 |
| 2015 | - | 1 | 83 | 4 | 95 | 103 | 58 | 78 | 12 | 179 |
| 2020 | 3 | - | 30 | 1 | 22 | 122 | 123 | 83 | 94 | 37 |
| 2025 | 16 | 2 | 79 | - | 92 | 64 | 186 | 42 | 6 | 99 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | - | - | 0.1 | - | 0.6 | 2.5 | 1.6 | 1.4 | - | 2.8 |
| 1997 | - | 0.0 | 0.1 | - | 1.1 | 0.9 | 2.8 | 2.5 | 0.2 | 0.7 |
| 2000 | 0.0 | - | 0.4 | 0.0 | 0.5 | 2.5 | 0.5 | 4.4 | - | 0.7 |
| 2005 | 0.0 | - | 0.1 | 0.0 | 1.9 | 3.4 | 0.3 | 2.8 | 4.2 | 0.1 |
| 2010 | - | - | 0.5 | - | 2.1 | 1.5 | 0.8 | 0.6 | 2.4 | 0.4 |
| 2015 | - | 0.1 | 0.7 | 0.0 | 5.1 | 2.2 | 0.8 | 2.6 | 0.2 | 5.4 |
| 2020 | 0.0 | - | 0.3 | 0.0 | 0.6 | 2.6 | 1.9 | 2.8 | 2.6 | 0.8 |
| 2025 | 0.1 | 0.1 | 1.0 | - | 2.2 | 0.9 | 3.2 | 0.7 | 0.3 | 1.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Arenaria congesta (ballhead sandwort) | Astragalus (milkvetch) | Astragalus 2 (Milkvetch) | Astragalus agrestis (purple milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus spatulatus (tufted milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 28 | - | - | 67 | 111 | - | - | - | 5 | 75 | 12 | - | - | 20 | 1 | 9 | 45 |
| 1997 | 40 | - | - | 10 | 125 | - | - | - | 6 | 58 | 4 | - | - | 21 | 6 | - | 31 |
| 2000 | 35 | - | - | 18 | 113 | - | - | - | 1 | 105 | 1 | - | - | 35 | 5 | - | 23 |
| 2005 | 21 | - | - | 56 | 107 | - | - | - | - | 82 | 5 | - | - | 23 | - | 1 | 5 |
| 2010 | 55 | - | - | 28 | 60 | - | - | - | - | 42 | 3 | - | - | 37 | 4 | 3 | 27 |
| 2015 | 27 | - | - | 79 | 87 | - | - | - | - | 33 | - | 1 | - | 16 | - | - | 19 |
| 2020 | 10 | - | - | 35 | 79 | - | - | - | 19 | 9 | - | 11 | - | 11 | 5 | 1 | 18 |
| 2025 | 37 | 3 | 2 | 3 | - | 14 | 53 | 8 | 2 | 14 | 2 | - | 2 | 20 | 2 | - | 13 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | - | - | 0.2 | 2.4 | - | - | - | 0.0 | 0.8 | 0.6 | - | - | 0.1 | 0.0 | 0.0 | 0.3 |
| 1997 | 0.1 | - | - | 0.1 | 2.3 | - | - | - | 0.0 | 0.5 | 0.0 | - | - | 0.1 | 0.2 | - | 0.2 |
| 2000 | 0.2 | - | - | 0.1 | 3.2 | - | - | - | 0.0 | 1.7 | 0.0 | - | - | 0.4 | 0.1 | - | 0.2 |
| 2005 | 0.2 | - | - | 0.4 | 2.5 | - | - | - | - | 1.1 | 0.0 | - | - | 0.4 | - | 0.0 | 0.0 |
| 2010 | 0.5 | - | - | 0.1 | 1.2 | - | - | - | - | 0.6 | 0.0 | - | - | 0.3 | 0.2 | 0.0 | 0.2 |
| 2015 | 0.1 | - | - | 0.7 | 1.8 | - | - | - | - | 0.1 | - | 0.0 | - | 0.0 | - | - | 0.2 |
| 2020 | 0.1 | - | - | 0.4 | 2.5 | - | - | - | 0.0 | 0.2 | - | 0.1 | - | 0.1 | 0.2 | 0.0 | 0.4 |
| 2025 | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.3 | 1.7 | 0.6 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.1 | 0.0 | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Castilleja linariifolia (Wyoming Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Claytonia lanceolata (lanceleaf springbeauty) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Cordylanthus[a] (bird's-beak) | Crepis intermedia (limestone hawksbeard) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 5 | - | - | 33 | 100 | - | 58 | - | 1 | 6 | - | 114 | 18 | - | 61 | 1 |
| 1997 | - | - | - | - | - | 110 | - | 54 | - | 21 | 10 | - | 85 | - | - | 45 | - |
| 2000 | - | 4 | - | - | - | 135 | - | 47 | - | - | - | 32 | 38 | 10 | 4 | 31 | - |
| 2005 | 1 | 16 | - | - | 16 | 64 | - | 57 | 9 | 8 | 5 | 38 | 4 | 9 | - | 27 | 5 |
| 2010 | - | 26 | 3 | - | 21 | 78 | 1 | 44 | 1 | 3 | - | 67 | - | 12 | 5 | 24 | - |
| 2015 | - | - | - | - | 2 | 103 | - | 65 | 5 | 6 | 7 | 71 | 7 | 10 | 7 | 20 | - |
| 2020 | 12 | - | - | - | - | 16 | - | 96 | - | 1 | 2 | 62 | 9 | 7 | - | 13 | - |
| 2025 | - | - | - | 2 | - | 42 | - | 11 | 5 | - | - | 58 | 25 | 6 | - | 17 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | - | 0.1 | 0.5 | - | 0.4 | - | 0.0 | 0.0 | - | 0.6 | 0.2 | - | 1.0 | 0.0 |
| 1997 | - | - | - | - | - | 0.5 | - | 0.2 | - | 0.0 | 0.0 | - | 0.3 | - | - | 0.3 | - |
| 2000 | - | 0.0 | - | - | - | 1.4 | - | 0.5 | - | - | - | 0.2 | 0.3 | 0.1 | 0.0 | 0.3 | - |
| 2005 | 0.0 | 0.4 | - | - | 0.0 | 0.6 | - | 0.5 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.1 | - | 0.4 | 0.0 |
| 2010 | - | 0.3 | 0.0 | - | 0.1 | 0.3 | 0.0 | 0.4 | 0.0 | 0.0 | - | 0.6 | - | 0.1 | 0.0 | 0.4 | - |
| 2015 | - | - | - | - | 0.0 | 0.6 | - | 0.8 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.2 | 0.2 | 0.4 | - |
| 2020 | 0.2 | - | - | - | - | 0.1 | - | 1.1 | - | 0.0 | 0.0 | 0.5 | 0.0 | 0.1 | - | 0.2 | - |
| 2025 | - | - | - | 0.0 | - | 0.3 | - | 0.1 | 0.0 | - | - | 0.3 | 0.1 | 0.0 | - | 0.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Hymenopappus filifolius (fineleaf hymenopappus) | Hymenoxys richardsonii (pingue rubberweed) | Ipomopsis aggregata (scarlet gilia) | Linum lewisii (Lewis flax) | Lithospermum (stoneseed) | Lupinus argenteus (silvery lupine) | Microsteris gracilis[a] (slender phlox) | Orthocarpus[a] (owl's-clover) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon caespitosus (mat penstemon) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Physaria ludoviciana (foothill bladderpod) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla hippiana (woolly cinquefoil) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 34 | - | - | 42 | 6 | 63 | - | 1 | 16 | 2 | 105 | 154 | 53 | - | 39 | 97 | - |
| 1997 | 52 | - | - | 29 | - | 57 | - | - | - | - | 80 | 114 | 48 | - | 10 | 62 | - |
| 2000 | 34 | 2 | - | 10 | - | 48 | - | 4 | - | 12 | 80 | 124 | 30 | - | 21 | 3 | - |
| 2005 | - | 5 | - | 20 | - | 20 | - | 1 | - | - | 73 | 124 | 28 | - | 34 | 65 | - |
| 2010 | - | 4 | - | 16 | - | 29 | - | - | - | - | 65 | 115 | 32 | - | 42 | 78 | - |
| 2015 | 10 | - | - | 26 | 4 | 0 | - | 1 | - | - | 72 | 112 | 38 | - | 78 | 11 | - |
| 2020 | - | 3 | - | 6 | - | 11 | 67 | - | - | - | 59 | 115 | 65 | 3 | 6 | 170 | - |
| 2025 | 10 | - | 4 | 10 | - | 5 | 3 | - | 1 | - | 47 | 132 | 30 | 14 | 7 | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.7 | - | - | 0.2 | 0.0 | 1.8 | - | 0.0 | 0.2 | 0.0 | 3.3 | 1.9 | 0.2 | - | 0.2 | 0.3 | - |
| 1997 | 0.3 | - | - | 0.1 | - | 1.9 | - | - | - | - | 0.7 | 0.8 | 0.2 | - | 0.1 | 0.1 | - |
| 2000 | 0.5 | 0.0 | - | 0.1 | - | 0.9 | - | 0.0 | - | 0.4 | 1.2 | 2.3 | 0.1 | - | 0.1 | 0.0 | - |
| 2005 | - | 0.0 | - | 0.1 | - | 0.1 | - | 0.0 | - | - | 2.1 | 2.4 | 0.2 | - | 0.6 | 0.2 | - |
| 2010 | - | 0.0 | - | 0.2 | - | 1.5 | - | - | - | - | 1.6 | 1.6 | 0.1 | - | 0.3 | 0.3 | - |
| 2015 | 0.1 | - | - | 0.3 | 0.0 | 0.0 | - | 0.0 | - | - | 0.9 | 1.8 | 0.2 | - | 0.6 | 0.0 | - |
| 2020 | - | 0.1 | - | 0.0 | - | 0.1 | 0.2 | - | - | - | 1.4 | 4.2 | 0.6 | 0.0 | 0.0 | 1.1 | - |
| 2025 | 0.1 | - | 0.0 | 0.2 | - | 0.0 | 0.0 | - | 0.0 | - | 0.3 | 3.3 | 0.1 | 0.0 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | unknown annual forb[a] (unknown forb) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1995 | 126 | 17 | 4 | 11 | 14 | - | - | 3 |
| 1997 | 128 | 44 | 2 | 46 | 14 | - | 1 | 4 |
| 2000 | 122 | 1 | - | 10 | 4 | - | - | - |
| 2005 | 93 | 21 | - | 12 | - | - | - | 6 |
| 2010 | 67 | 10 | 2 | 12 | - | - | - | 5 |
| 2015 | 83 | 3 | 5 | 7 | - | 1 | - | 3 |
| 2020 | 55 | 29 | - | - | - | - | - | 7 |
| 2025 | 50 | 20 | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | |
| 1995 | 2.4 | 0.1 | 0.0 | 0.1 | 0.1 | - | - | 0.0 |
| 1997 | 0.7 | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 |
| 2000 | 1.1 | 0.0 | - | 0.1 | 0.0 | - | - | - |
| 2005 | 0.9 | 0.4 | - | 0.1 | - | - | - | 0.0 |
| 2010 | 0.8 | 0.1 | 0.0 | 0.1 | - | - | - | 0.0 |
| 2015 | 1.2 | 0.0 | 0.1 | 0.1 | - | 0.0 | - | 0.1 |
| 2020 | 1.2 | 0.6 | - | - | - | - | - | 0.0 |
| 2025 | 0.5 | 0.1 | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Pediocactus simpsonii (mountain ball cactus) | Peraphyllum ramosissimum[p] (wild crab apple) | Pinus edulis[t] (twoneedle pinyon) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 1997 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 24.7 | 2.9 | 0.9 | 0.3 | 0.4 | - | 2.1 | 0.1 | - | 0.1 |
| 2010 | 27.2 | 2.4 | 0.9 | 0 | - | - | 2.4 | - | - | 0.2 |
| 2015 | 23.8 | 2.4 | 2 | 0.2 | - | - | 0.7 | - | - | 0.2 |
| 2020 | 20.9 | 2.1 | 2.3 | 0 | 0.3 | - | 2.7 | - | - | 0.2 |
| 2025 | 24.2 | 3.3 | 0.8 | 0.1 | 0.3 | - | 2.2 | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | 13.8 | 1.7 | 0.8 | 0.5 | 0.0 | 0.0 | 2.3 | - | - | - |
| 1997 | 11.5 | 1.6 | 0.4 | 0.0 | 0.6 | 0.0 | 1.2 | - | - | 0.0 |
| 2000 | 13.2 | 1.3 | 0.7 | - | 0.1 | 0.0 | 1.9 | - | - | 0.1 |
| 2005 | 16.9 | 2.7 | 0.8 | 0.3 | 0.1 | 0.0 | 3.0 | 0.0 | - | 0.2 |
| 2010 | 17.1 | 2.3 | 0.8 | 0.0 | - | - | 2.6 | - | - | 0.0 |
| 2015 | 20.1 | 2.1 | 0.4 | 0.2 | 0.4 | - | 2.3 | - | - | 0.1 |
| 2020 | 19.1 | 3.0 | 1.3 | 0.1 | 0.1 | 0.0 | 2.7 | - | 0.0 | 0.0 |
| 2025 | 16.3 | 3.0 | 0.5 | 0.2 | 0.1 | - | 2.9 | - | - | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 54/57 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 5180 | 1680 | 40 | 54 | 6 | 20 | 1 | 1 | 77/88 |
| 1997 | 4440 | 520 | 32 | 59 | 9 | 25 | 2 | 5 | 83/103 |
| 2000 | 5640 | 300 | 29 | 57 | 14 | 26 | 1 | 9 | 79/88 |
| 2005 | 5000 | 2800 | 12 | 70 | 18 | 14 | 4 | 9 | 72/88 |
| 2010 | 4860 | 1520 | 19 | 55 | 26 | 29 | 26 | 11 | 74/92 |
| 2015 | 4900 | 100 | 30 | 55 | 15 | 45 | 38 | 23 | 65/86 |
| 2020 | 4460 | 160 | 21 | 67 | 12 | 42 | 6 | 10 | 68/89 |
| 2025 | 5520 | 1260 | 16 | 68 | 17 | 16 | 8 | 19 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 100 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 5780 | - | 6 | 92 | 2 | 0 | 0 | 1 | 13/22 |
| 1997 | 3720 | - | 3 | 96 | 1 | 1 | 0 | 0 | 10/17 |
| 2000 | 4680 | - | 10 | 87 | 3 | 0 | 0 | 3 | 10/19 |
| 2005 | 5760 | - | 5 | 94 | 1 | 14 | 0 | 1 | 10/20 |
| 2010 | 5360 | 20 | 3 | 96 | 0 | 21 | 13 | 0 | 11/22 |
| 2015 | 4600 | - | 4 | 96 | 0 | 39 | 27 | 0 | 11/21 |
| 2020 | 4640 | - | 0 | 98 | 2 | 13 | 24 | 0 | 9/22 |
| 2025 | 6160 | - | 4 | 96 | 0 | 13 | 76 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 2700 | - | 36 | 64 | 0 | 0 | 0 | 0 | 24/29 |
| 1997 | 1600 | - | 15 | 85 | 0 | 0 | 0 | 0 | 21/28 |
| 2000 | 1780 | - | 39 | 58 | 2 | 0 | 0 | 1 | 22/26 |
| 2005 | 1240 | - | 11 | 86 | 3 | 2 | 0 | 0 | 20/25 |
| 2010 | 1480 | 140 | 19 | 81 | 0 | 0 | 0 | 0 | 22/25 |
| 2015 | 1380 | - | 26 | 74 | 0 | 20 | 0 | 9 | 16/20 |
| 2020 | 1480 | - | 19 | 81 | 0 | 12 | 0 | 0 | 19/22 |
| 2025 | 1040 | - | 25 | 73 | 2 | 19 | 17 | 2 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 500 | - | 4 | 96 | 0 | 0 | 0 | 0 | 16/19 |
| 1997 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/11 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/14 |
| 2005 | 840 | - | 5 | 95 | 0 | 0 | 0 | 0 | 12/19 |
| 2010 | 300 | - | 47 | 53 | 0 | 0 | 0 | 0 | 16/20 |
| 2015 | 220 | - | 9 | 82 | 9 | 0 | 0 | 0 | 10/19 |
| 2020 | 400 | - | 10 | 90 | 0 | 0 | 0 | 0 | 9/11 |
| 2025 | 280 | - | 0 | 100 | 0 | 21 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| 2015 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 100 | - | 20 | 60 | 20 | 60 | 0 | 20 | - / - |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 11/19 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 12/40 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 1995 | 220 | - | 9 | 91 | 0 | 46 | 9 | 0 | 71/89 |
| 1997 | 300 | - | 20 | 73 | 7 | 33 | 33 | 0 | 65/100 |
| 2000 | 220 | - | 18 | 55 | 27 | 46 | 0 | 18 | 72/95 |
| 2005 | 400 | - | 50 | 45 | 5 | 40 | 35 | 0 | 67/100 |
| 2010 | 280 | - | 7 | 79 | 14 | 21 | 57 | 14 | 71/87 |
| 2015 | 240 | 60 | 17 | 67 | 17 | 17 | 67 | 25 | 62/102 |
| 2020 | 260 | - | 8 | 85 | 8 | 23 | 69 | 8 | 63/86 |
| 2025 | 300 | - | 53 | 40 | 7 | 7 | 87 | 7 | - / - |

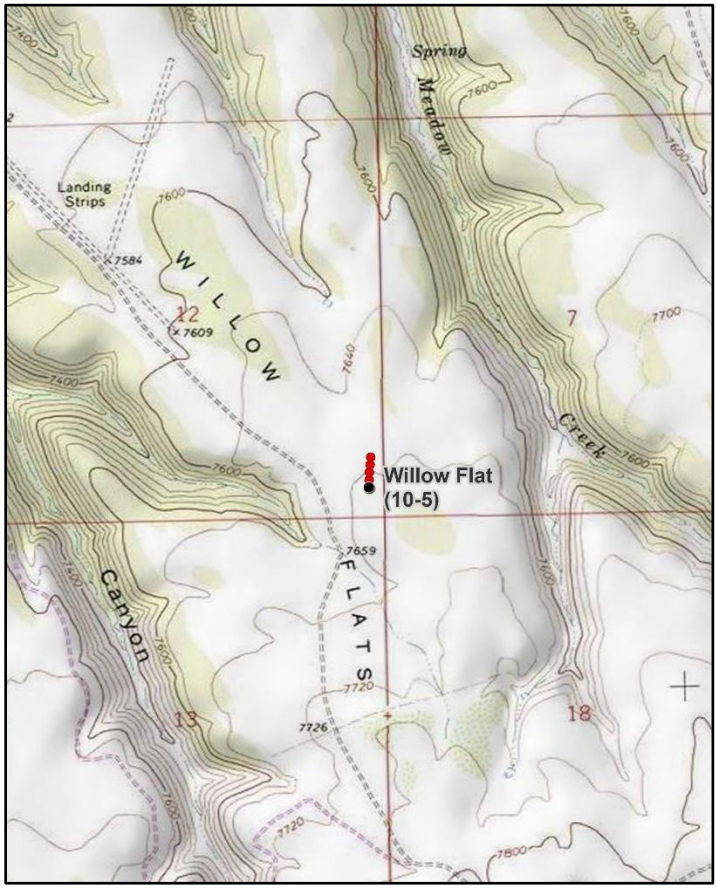
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/10 |
| 2000 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 5/10 |
| 2005 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 5/9 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/6 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/9 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 35/52 |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 27/61 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 36/54 |
| 2015 | - | - | - | - | - | - | - | - | 29/64 |
| 2020 | - | - | - | - | - | - | - | - | 26/54 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/25 |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/48 |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 20/25 |
| 2010 | - | - | - | - | - | - | - | - | 20/23 |
| 2015 | - | - | - | - | - | - | - | - | 19/26 |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 39/38 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 120 | - | 33 | 67 | 0 | 0 | 17 | 0 | 17/32 |
| 1997 | 140 | - | 14 | 86 | 0 | 14 | 0 | 0 | 16/24 |
| 2000 | 260 | - | 8 | 92 | 0 | 0 | 0 | 0 | 17/23 |
| 2005 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/23 |
| 2010 | 300 | - | 13 | 87 | 0 | 33 | 0 | 0 | 20/24 |
| 2015 | 240 | - | 8 | 92 | 0 | 75 | 17 | 0 | 12/18 |
| 2020 | 160 | - | 13 | 88 | 0 | 13 | 0 | 0 | 24/34 |
| 2025 | 120 | - | 17 | 83 | 0 | 0 | 83 | 0 | - / - |

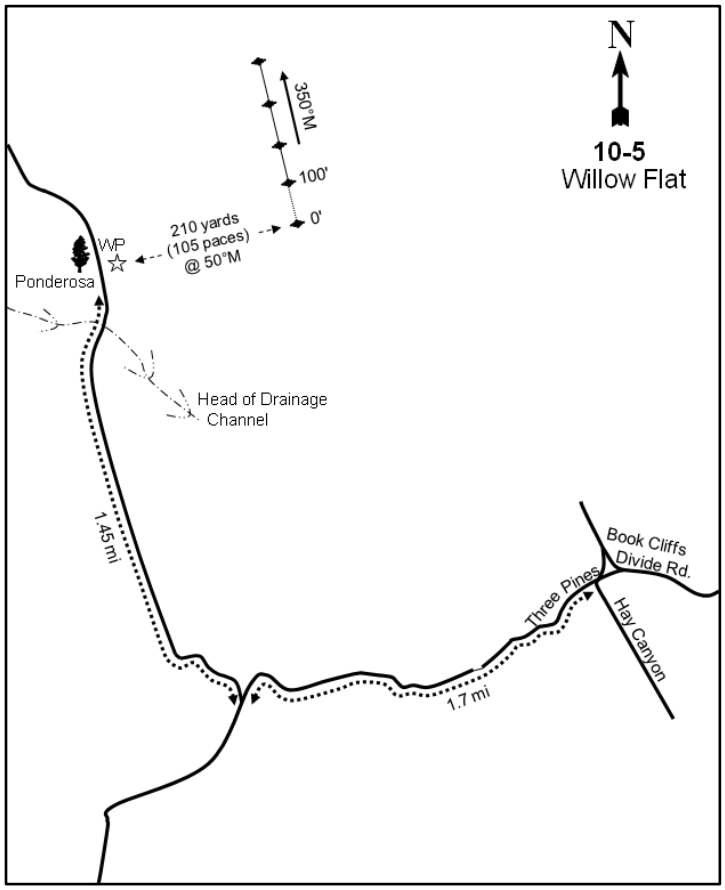
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-04.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 10 | - | - | - | - | - | 12.0 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 1995 | 17 | - | - | - | - | - | 13.6 |
| 2000 | 13 | - | - | - | - | - | 11.1 |
| 2015 | 54 | - | 100 | - | - | - | 2.6 |
| 2020 | 68 | - | 59 | 41 | - | - | 3.8 |
| 2025 | 30 | 18 | 73 | 9 | - | - | 3.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 4 | - | - | - | - | - | 14.0 |
| 2025 | 18 | 100 | - | - | - | - | 1.5 |

# WILLOW FLAT - STUDY NO. 10-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cedar Camp Canyon SE; Township 16S, Range 22E, Section 12 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 634969 East 4365004 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9097 |
| Transect Bearing | 350° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of the Seep Ridge and Book Cliff Divide roads, proceed west along the divide for 9.4 miles to the major Three Pines-Hay Canyon intersection. Continue straight for 1.7 miles to a road on the right to Willow Flat. Turn right here and go 1.45 miles until you see a large ponderosa pine (*Pinus ponderosa*) (with other conifers at the head of a small canyon) on the left (west) side of the road and a witness post on the right (east) side. From the witness post, walk 210 yards at 50 degrees magnetic to the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | BOOKCLIFFS PASTURE |
| Elevation | 7,680ft (2,341m) |
| Aspect | West |
| Slope | 2-5% |
| Sample Dates | 06/27/1995, 06/21/2000, 06/14/2005, 06/22/2010, 06/09/2015, 06/10/2020, 06/25/2025 |

**Table 10-05.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Herbicide Unknown | - | - | Prior to 1982 | - |
| Herbicide - Tebuthiuron | - | - | 2005 | 225 |
| Hand Crew - Lop and Scatter | Cedar Camp Lop and Scatter | 1337 | May-June 2010 | 2042 |

## Wildlife Habitat and Vegetation History

**Table 10-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Perennial Grass | Early Phase I |
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2015 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2020 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.0 | 30.0 | 40.0 | 30.0 | 2.3 | 1.8 | 204.8 | 0.8 | 06/21/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1982 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.2<br>1988-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

When the study was established in 1982 the site was dominated by perennial grasses, but it had a browse component of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) that increased in dominance until a herbicide application in 2005 caused a decrease in cover and density. Although sagebrush cover and density have increased in subsequent sample years (Photos, Pre-1992 Data, Table 10-05.1, Table 10-05.12), the herbaceous understory has been considered to be co-dominant with sagebrush since 2010. Herbaceous composition has been diverse, with mainly native perennial grass species contributing a majority of the cover; forbs have been moderately abundant over the study period (Table 10-05.7, Table 10-05.10, Table 10-05.11). Over the sample years, twoneedle pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and/or Rocky Mountain juniper (*J. scopulorum*) trees have been scattered throughout the area. In 2010, pinyon and juniper were treated by a lop and scatter project (Table 10-05.1). A tree component has remained following treatment (Table 10-05.12, Table 10-05.14), indicating that there may be potential for infilling in the future. However, the site has been considered to be within Early Phase I of woodland succession throughout the study period (Table 10-05.4), suggesting that infilling may not be an immediate concern.

The abundant grass and forb communities on this site may provide forage for elk and deer during the summer months (Table 10-05.3, Table 10-05.6). Pellet transect data indicates that elk presence has been moderate since 2000, but presence of mule deer has been lowover the same period; deer presence was at its highest in 2010 (Table 10-05.9). During the 2024/25 winter season the site had scattered occurrences of nearby collared mule deer (Wildlife Migration Initiative). Utilization of mountain big sagebrush has been

light most sample years, but the percentage of plants sampled in density strips being moderately to heavily hedged reached 52% in 2025 (Table 10-05.13). On-site observations in 2025 noted moderate utilization (20-40%) on thickspike wheatgrass (*Elymus lanceolatus*) and needle and thread (*Hesperostipa comata*), but little to no utilization on forb species.

## Trend Summary Tables

**Table 10-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 19.7 | 0.2 | 0.5 | - | - | - |
| 2000 | 22.5 | 0.2 | 1.0 | - | - | - |
| 2005 | 27.6 | 0.6 | 0.6 | 29.2 | 0.1 | 0.7 |
| 2010 | 6.7 | 0.1 | 0.0 | 8.2 | 0.3 | 0.1 |
| 2015 | 9.3 | 0.8 | 0.6 | 12.4 | 0.5 | 0.7 |
| 2020 | 13.3 | 0.7 | 0.7 | 20.1 | 0.3 | 0.9 |
| 2025 | 13.3 | 0.7 | 1.1 | 22.5 | 0.6 | 1.0 |

**Table 10-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 363 | 282 | 355 | - | 7.2 | 1.1 | 13.2 |
| 2000 | - | 339 | 20 | 307 | - | 6.7 | 0.3 | 7.1 |
| 2005 | - | 308 | 123 | 260 | - | 10.2 | 0.9 | 4.9 |
| 2010 | - | 325 | 214 | 255 | - | 15.0 | 2.4 | 9.3 |
| 2015 | 18 | 438 | 82 | 290 | 0.1 | 26.5 | 1.3 | 7.7 |
| 2020 | 4 | 442 | 290 | 211 | 0.0 | 22.2 | 1.7 | 4.5 |
| 2025 | - | 424 | 3 | 226 | - | 17.5 | 0.0 | 2.9 |

**Table 10-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 34.3 | 3.0 | 33.8 | 0.3 | 0.7 | 39.8 |
| 2000 | 53.3 | 3.4 | 34.2 | 0.7 | 0.0 | 38.9 |
| 2005 | 51.3 | 0.4 | 22.7 | 1.1 | 0.1 | 39.6 |
| 2010 | 40.0 | 0.1 | 36.0 | 0.6 | 0.0 | 38.1 |
| 2015 | 29.7 | 0.9 | 34.8 | 0.2 | 0.0 | 49.4 |
| 2020 | 35.9 | 0.3 | 35.0 | 0.4 | 0.0 | 48.7 |
| 2025 | 40.3 | 0.1 | 40.5 | 1.2 | 0.1 | 33.3 |

**Table 10-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 7 | 14 | - | 3 |
| 2000 | 2 | 6 | 20 | - | 9 |
| 2005 | 2 | 10 | 33 | 1 | 14 |
| 2010 | 1 | 19 | 13 | 1 | 3 |
| 2015 | 7 | 2 | 17 | 5 | 15 |
| 2020 | 5 | 8 | 23 | 2 | 4 |
| 2025 | 5 | 6 | 18 | - | 12 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 8.0 (19.7) | 6.0 (14.9) | 32.2 (79.5) | - | - |
| 2005 | - | 4.0 (9.9) | 30.8 (76.1) | - | - |
| 2010 | 11.6 (28.7) | 26.2 (64.6) | 29.5 (72.8) | 0.6 (1.4) | - |
| 2015 | 14.5 (35.9) | 0.7 (1.7) | 17.4 (43.0) | 3.5 (8.6) | - |
| 2020 | 7.2 (17.9) | 2.7 (6.6) | 31.5 (77.8) | 1.2 (2.9) | - |
| 2025 | 26.8 (66.3) | 13.4 (33.1) | 38.9 (96.0) | 2.9 (7.2) | - |

**Table 10-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | - | - | 11 | - | - | 139 | 83 | 130 | 149 | 1 | 143 |
| 2000 | - | - | 5 | - | - | 158 | 64 | 85 | 170 | - | 160 |
| 2005 | - | - | 4 | - | - | 75 | 33 | 133 | 83 | - | 165 |
| 2010 | - | - | 3 | - | - | 207 | 104 | 73 | 47 | 14 | 106 |
| 2015 | 7 | 18 | 61 | - | 4 | 330 | 67 | 73 | 64 | 50 | 150 |
| 2020 | 26 | 4 | 67 | - | 5 | 368 | 84 | 9 | 80 | 26 | 195 |
| 2025 | 35 | - | 145 | 25 | 4 | 289 | 19 | 3 | 65 | 6 | 209 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | - | - | 0.1 | - | - | 0.8 | 0.6 | 2.0 | 1.9 | 0.0 | 1.9 |
| 2000 | - | - | 0.0 | - | - | 0.8 | 0.6 | 0.8 | 2.5 | - | 1.9 |
| 2005 | - | - | 0.0 | - | - | 0.3 | 0.6 | 3.1 | 2.1 | - | 4.2 |
| 2010 | - | - | 0.0 | - | - | 3.9 | 6.9 | 1.6 | 0.6 | 0.5 | 1.5 |
| 2015 | 0.3 | 0.1 | 0.5 | - | 0.2 | 11.0 | 4.8 | 1.3 | 2.0 | 2.5 | 3.7 |
| 2020 | 0.7 | 0.0 | 0.9 | - | 0.1 | 11.1 | 2.7 | 0.0 | 2.7 | 1.3 | 2.6 |
| 2025 | 1.1 | - | 4.5 | 0.2 | 0.1 | 6.0 | 0.5 | 0.2 | 1.7 | 0.2 | 2.9 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis demissa (nodding rockcress) | Arabis drummondii (Drummond's rockcress) | Artemisia dracunculus (tarragon) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Astragalus purshii (woollypod milkvetch) | Astragalus spatulatus (tufted milkvetch) | Brassicaceae[a] (mustard family) | Calochortus nuttallii (sego lily) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 6 | 2 | - | 82 | 185 | - | - | - | - | 10 | - | 16 | 25 | - | 8 | 3 | 19 |
| 2000 | 2 | - | - | 11 | 113 | - | - | - | - | 2 | - | 17 | 31 | 8 | 2 | - | - |
| 2005 | 8 | 0 | - | 42 | 48 | - | - | - | - | 9 | - | 4 | 8 | 3 | 5 | - | 18 |
| 2010 | 7 | - | - | 35 | 33 | - | - | - | - | - | 1 | 5 | 16 | 3 | - | - | 3 |
| 2015 | 25 | - | - | 72 | 41 | - | - | - | - | 27 | - | - | 16 | - | 1 | - | 3 |
| 2020 | 10 | - | 3 | 3 | 50 | - | - | - | - | 5 | - | 4 | 4 | 1 | 2 | - | - |
| 2025 | 6 | - | - | - | - | 5 | 21 | 5 | 3 | 3 | - | 8 | 5 | 2 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | - | 0.2 | 4.2 | - | - | - | - | 0.0 | - | 0.2 | 0.4 | - | 0.2 | 0.0 | 0.0 |
| 2000 | 0.0 | - | - | 0.2 | 1.4 | - | - | - | - | 0.0 | - | 0.1 | 0.4 | 0.0 | 0.0 | - | - |
| 2005 | 0.0 | 0.0 | - | 0.2 | 0.3 | - | - | - | - | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 |
| 2010 | 0.0 | - | - | 0.3 | 1.5 | - | - | - | - | - | 0.0 | 0.0 | 0.3 | 0.0 | - | - | 0.0 |
| 2015 | 0.5 | - | - | 1.3 | 1.3 | - | - | - | - | 0.1 | - | - | 0.4 | - | 0.0 | - | 0.0 |
| 2020 | 0.0 | - | 0.0 | 0.0 | 1.3 | - | - | - | - | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - |
| 2025 | 0.0 | - | - | - | - | 0.2 | 0.8 | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Castilleja flava (yellow Indian paintbrush) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Lygodesmia (skeletonplant) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 91 | - | 40 | - | 64 | 89 | 15 | - | 24 | - | 5 | - | - | 6 | 6 | 65 | - |
| 2000 | 40 | - | 35 | - | 1 | 91 | 22 | - | 27 | - | - | 4 | - | 13 | - | 45 | 1 |
| 2005 | - | - | 25 | - | 31 | 50 | 9 | 3 | 37 | 8 | 10 | - | - | 5 | 1 | 23 | - |
| 2010 | 13 | - | 27 | - | 8 | 56 | 6 | 5 | 21 | 49 | - | 7 | - | 8 | 3 | 64 | - |
| 2015 | 5 | 3 | 27 | 1 | 13 | 75 | 2 | 2 | 10 | - | - | - | 8 | 7 | - | 23 | - |
| 2020 | 11 | - | 42 | 4 | 0 | 32 | 3 | - | 15 | 5 | - | - | - | - | - | 31 | - |
| 2025 | 6 | - | - | 7 | - | 55 | - | - | 21 | - | - | - | - | - | - | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.6 | - | 0.3 | - | 0.2 | 1.2 | 0.1 | - | 0.4 | - | 0.1 | - | - | 0.0 | 0.0 | 1.4 | - |
| 2000 | 0.3 | - | 0.3 | - | 0.0 | 0.6 | 0.1 | - | 0.3 | - | - | 0.0 | - | 0.1 | - | 0.7 | 0.0 |
| 2005 | - | - | 0.2 | - | 0.1 | 0.3 | 0.1 | 0.0 | 0.6 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.1 | - |
| 2010 | 0.2 | - | 0.5 | - | 0.1 | 0.4 | 0.2 | 0.0 | 0.3 | 0.6 | - | 0.0 | - | 0.0 | 0.0 | 3.4 | - |
| 2015 | 0.1 | 0.0 | 0.4 | 0.0 | 0.1 | 0.6 | 0.0 | 0.0 | 0.3 | - | - | - | 0.0 | 0.1 | - | 0.3 | - |
| 2020 | 0.1 | - | 0.9 | 0.0 | 0.0 | 0.3 | 0.1 | - | 0.3 | 0.0 | - | - | - | - | - | 0.1 | - |
| 2025 | 0.0 | - | - | 0.0 | - | 0.2 | - | - | 0.2 | - | - | - | - | - | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Orthocarpus[a] (owl's-clover) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon caespitosus (mat penstemon) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria ludoviciana (foothill bladderpod) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 1 | 5 | 6 | 3 | 62 | 55 | 70 | 264 | 3 | 5 | 30 | 2 | 88 | 13 | - | - | - |
| 2000 | 1 | 2 | 10 | 7 | - | 105 | 66 | - | 4 | 11 | 1 | - | 47 | 4 | - | 3 | - |
| 2005 | - | - | 2 | 7 | 51 | 14 | 94 | 73 | 4 | 5 | 33 | - | 12 | 2 | - | - | - |
| 2010 | - | - | 4 | 10 | 21 | 53 | 38 | 149 | 9 | 2 | 6 | - | 41 | 5 | - | 1 | 5 |
| 2015 | - | - | 7 | 1 | 19 | 78 | 125 | 7 | 5 | - | 2 | - | 34 | 3 | - | - | - |
| 2020 | - | 1 | 8 | 14 | 9 | 71 | 34 | 290 | 3 | - | 3 | - | 16 | 3 | 4 | 1 | - |
| 2025 | - | - | 1 | - | 21 | 121 | 38 | - | 3 | - | 3 | 1 | 25 | - | 4 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.0 | 0.1 | 1.1 | 0.2 | 0.8 | 0.8 | 0.2 | 0.0 | 0.1 | 0.0 | 0.9 | 0.4 | - | - | - |
| 2000 | 0.0 | 0.0 | 0.1 | 0.2 | - | 1.7 | 0.3 | - | 0.1 | 0.0 | 0.0 | - | 0.3 | 0.0 | - | 0.0 | - |
| 2005 | - | - | 0.0 | 0.2 | 0.9 | 0.1 | 1.3 | 0.2 | 0.1 | 0.1 | 0.5 | - | 0.1 | 0.0 | - | - | - |
| 2010 | - | - | 0.1 | 0.1 | 0.5 | 0.4 | 0.6 | 1.3 | 0.0 | 0.0 | 0.1 | - | 0.7 | 0.0 | - | 0.0 | 0.0 |
| 2015 | - | - | 0.1 | 0.0 | 0.1 | 0.3 | 2.2 | 0.0 | 0.2 | - | 0.0 | - | 0.6 | 0.0 | - | - | - |
| 2020 | - | 0.0 | 0.0 | 0.1 | 0.1 | 0.5 | 0.1 | 1.6 | 0.0 | - | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | - |
| 2025 | - | - | 0.0 | - | 0.4 | 0.4 | 0.1 | - | 0.0 | - | 0.0 | 0.0 | 0.1 | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus[t] (juniper) | Juniperus osteosperma[t] (Utah juniper) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Pediocactus simpsonii (mountain ball cactus) | Peraphyllum ramosissimum[p] (wild crab apple) | Pinus edulis[t] (twoneedle pinyon) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 27.6 | 1.6 | - | 0.1 | 0.7 | - | - | - | - | - | 0 |
| 2010 | 4.4 | 3.8 | 0.3 | 0 | 0.1 | - | - | - | - | - | 0 |
| 2015 | 9.3 | 3.1 | 0.1 | 0.4 | 0.7 | - | - | - | - | - | - |
| 2020 | 17 | 2.9 | 0.3 | - | 0.9 | - | - | - | 0.2 | - | - |
| 2025 | 19.5 | 2.7 | 0.1 | 0.5 | - | - | 1 | - | 0 | - | 0.3 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1995 | 16.0 | 3.3 | 0.0 | 0.2 | 0.5 | - | - | 0.0 | - | - | 0.4 |
| 2000 | 20.4 | 1.9 | 0.2 | 0.0 | 0.9 | - | - | - | - | 0.0 | 0.3 |
| 2005 | 24.9 | 2.6 | 0.4 | 0.2 | 0.6 | - | - | 0.0 | - | 0.0 | 0.2 |
| 2010 | 3.8 | 2.8 | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 |
| 2015 | 6.2 | 3.1 | 0.7 | 0.1 | 0.6 | - | - | 0.0 | - | - | 0.0 |
| 2020 | 11.0 | 2.2 | 0.7 | - | 0.7 | - | - | 0.0 | 0.0 | 0.0 | 0.1 |
| 2025 | 10.5 | 2.7 | 0.3 | 0.4 | - | 0.4 | 0.6 | 0.0 | 0.0 | 0.1 | 0.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 8840 | 1620 | 43 | 56 | 1 | 9 | 1 | 0 | 63/72 |
| 2000 | 10060 | 600 | 29 | 56 | 15 | 22 | 0 | 0 | 60/72 |
| 2005 | 7940 | 3500 | 7 | 74 | 19 | 27 | 3 | 9 | 60/71 |
| 2010 | 2480 | 180 | 37 | 52 | 11 | 3 | 0 | 7 | 49/50 |
| 2015 | 3400 | - | 34 | 56 | 10 | 31 | 29 | 15 | 44/54 |
| 2020 | 3820 | 1400 | 21 | 68 | 12 | 20 | 0 | 10 | 64/75 |
| 2025 | 4700 | 2160 | 27 | 65 | 8 | 20 | 32 | 8 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 5400 | - | 13 | 87 | 0 | 0 | 0 | 0 | 11/18 |
| 2000 | 5340 | 60 | 10 | 82 | 8 | 12 | 0 | 3 | 9/20 |
| 2005 | 4660 | 20 | 3 | 93 | 3 | 44 | 0 | 2 | 11/23 |
| 2010 | 4620 | - | 4 | 96 | 0 | 1 | 4 | 0 | 14/31 |
| 2015 | 5380 | - | 7 | 93 | 0 | 40 | 35 | 0 | 12/27 |
| 2020 | 6280 | 140 | 4 | 89 | 8 | 40 | 17 | 8 | 10/21 |
| 2025 | 7240 | 180 | 20 | 79 | 1 | 17 | 74 | 1 | - / - |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 500 | - | 8 | 92 | 0 | 0 | 0 | 0 | 21/26 |
| 2000 | 320 | - | 6 | 75 | 19 | 0 | 0 | 0 | 17/21 |
| 2005 | 300 | - | 13 | 80 | 7 | 0 | 0 | 0 | 19/23 |
| 2010 | 560 | - | 7 | 93 | 0 | 0 | 0 | 4 | 26/32 |
| 2015 | 860 | 180 | 28 | 72 | 0 | 0 | 0 | 2 | 25/36 |
| 2020 | 720 | - | 22 | 75 | 3 | 11 | 0 | 3 | 25/30 |
| 2025 | 380 | - | 5 | 90 | 5 | 5 | 16 | 11 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/17 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 360 | - | 17 | 83 | 0 | 0 | 0 | 0 | 15/21 |
| 2000 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 10/8 |
| 2005 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/21 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/34 |
| 2015 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/24 |
| 2020 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/14 |
| 2025 | 640 | 200 | 3 | 97 | 0 | 0 | 0 | 0 | - / - |
| Juniperus[t] -- (juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | 40 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 140 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

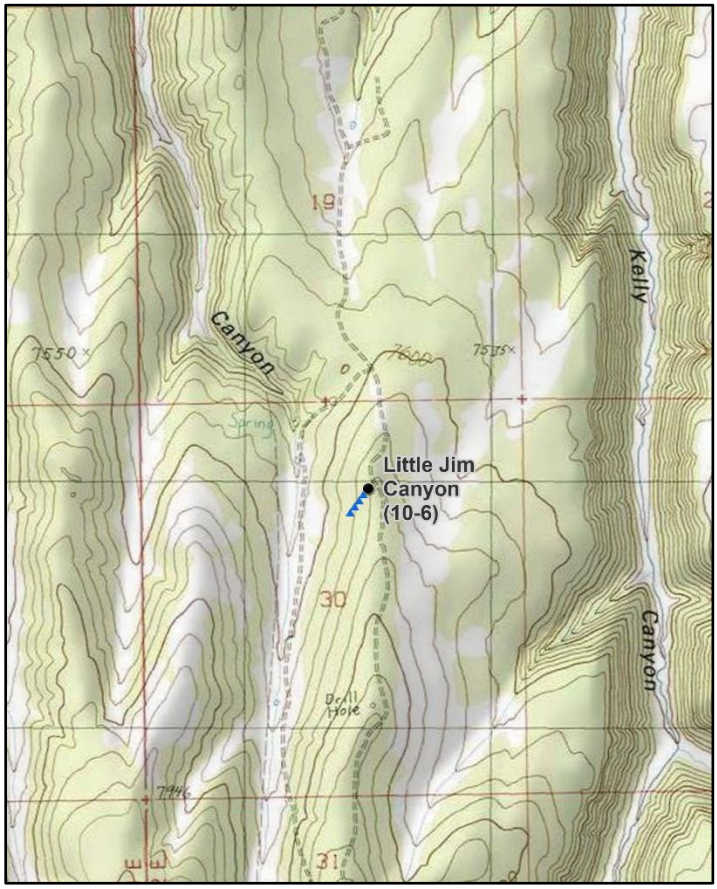
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 48/55 |
| 2000 | - | - | - | - | - | - | - | - | 49/62 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 53/64 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 43/52 |
| 2020 | 40 | - | 50 | 50 | 0 | 0 | 100 | 0 | 45/59 |
| 2025 | 40 | - | 50 | 50 | 0 | 50 | 50 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/10 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/7 |
| 2020 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 7/10 |
| 2025 | 40 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/89 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/53 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/43 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 20/41 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/39 |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

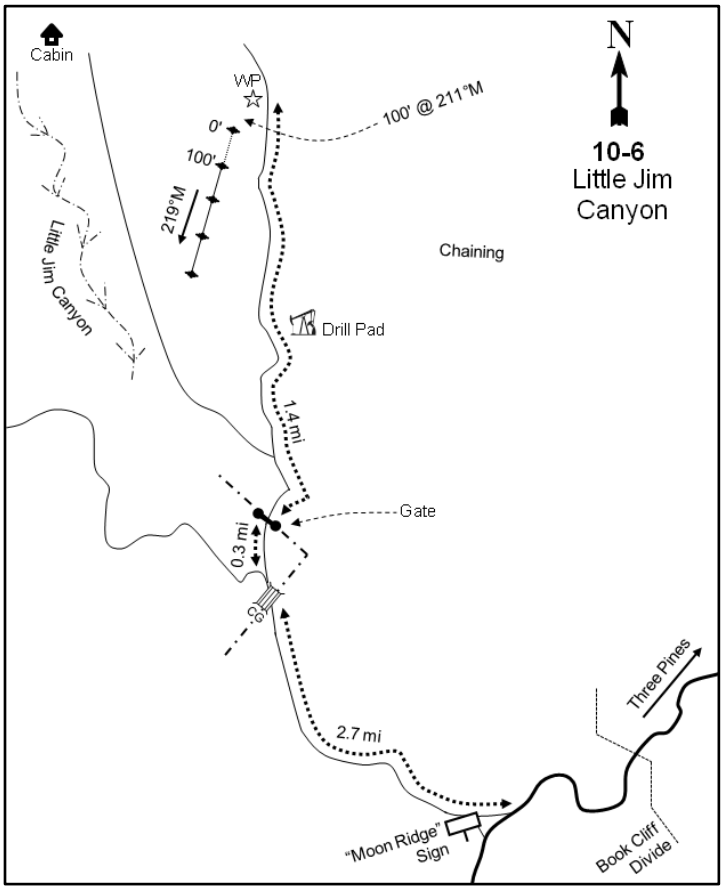
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus (juniper) | | | | | | | |
| 1995 | 46 | - | - | - | - | - | 11.5 |
| 2000 | 36 | - | - | - | - | - | 12.5 |
| 2005 | 52 | 17 | 11 | 61 | 11 | - | 9.9 |
| 2015 | 67 | - | 100 | - | - | - | 2.7 |
| 2020 | 79 | - | 89 | 11 | - | - | 3.6 |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2025 | 33 | 25 | 75 | - | - | - | 5.1 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 55 | 5 | 95 | - | - | - | 6.4 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 6 | - | - | - | - | - | 7.7 |
| 2005 | 6 | - | 33 | 33 | - | 33 | 9.0 |
| 2015 | 4 | - | 100 | - | - | - | 3.3 |
| 2020 | 12 | 14 | 86 | - | - | - | 2.8 |
| 2025 | 15 | 33 | 50 | 17 | - | - | 4.7 |

# LITTLE JIM CANYON - STUDY NO. 10-6




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tenmile Canyon North; Township 16S, Range 22E, Section 30 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 626445 East 4361161 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9099 |
| Transect Bearing | 204° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Three Pines, proceed southwest along the Divide road for about 10.5 miles to a major junction at Moon Ridge. Turn right and drive for 2.7 miles to a cattle guard. Just before the cattle guard and fence, turn right and travel along the fence for 0.3 miles to a gate. Stay to the right and continue down the ridges for 1.4 miles to the witness post on the left (west) side of the road. From the witness post, the 0-foot baseline stake is 100 feet into the chaining at a bearing of 211 degrees magnetic. The 0-foot stake is marked by browse tag #9099.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | MCCLELLAND |
| Elevation | 7,700ft (2,347m) |
| Aspect | Southwest |
| Slope | 15% |
| Sample Dates | 06/20/1995, 06/22/2000, 08/21/2012, 07/14/2015, 08/15/2017, 07/28/2021, 06/11/2025 |

**Table 10-06.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Mechanical - Bullhog | Little Jim Bullhog | 2219 | April-July 2013 | 669 |

## Wildlife Habitat and Vegetation History

**Table 10-06.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | substantial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-06.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Mixed Mountain Brush | Early Phase I |
| 1995 | Mixed Mountain Brush | Phase I |
| 2000 | Mixed Mountain Brush | Phase I |
| 2012 | Mixed Mountain Brush | Phase I |
| 2015 | Mixed Mountain Brush | Early Phase I |
| 2017 | Mixed Mountain Brush | Early Phase I |
| 2021 | Mixed Mountain Brush | Early Phase I |
| 2025 | Mixed Mountain Brush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-06.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.3 | 38.0 | 37.4 | 24.6 | 6.7 | 8.3 | 96.0 | 0.8 | 06/22/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

The browse component on this study site has been dominated by mixed mountain brush species such as mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), alderleaf mountain mahogany (*Cercocarpus montanus*), and mountain snowberry (*Symphoricarpos oreophilus*) since study establishment in 1988 (Photos, Pre-1992 Data, Table 10-06.12, Table 10-06.13). The herbaceous understory has remained somewhat diverse and has consisted mostly of native perennial grasses such as Indian ricegrass (*Achnatherum hymenoides*) and squirreltail (*Elymus elymoides*). The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed in the understory, but it has provided limited cover (Table 10-06.10). Forb species have remained rare in comparison with grasses (Table 10-06.7, Table 10-06.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) increased in abundance over the sample period and were becoming co-dominant with the browse component. In 2013, however, the site was treated with a bullhog (Table 10-06.1) that removed nearly all of the pinyon and juniper trees. An extant tree component is present as of 2025, indicating that infilling could occur in the future. However, the site has remained within Early Phase I of woodland succession in all post-treatment sample years, suggesting that infilling is likely not an immediate concern (Table 10-06.4, Table 10--06.14). Sagebrush has steadily increased in both cover and density since the removal of pinyon and juniper. Due to the increased abundance and diversity of sagebrush and grass composition the site is considered to be improving in condition for mule deer summering habitat (Table 10-06.10, Table 10-06.12, Table 10-06.13).

The abundant preferred shrub and grass communities on this site likely provides adequate forage for deer and elk (Beck & Peek, 2005) during the summer months (Table 10-06.3, Table 10-06.6, Table 10-06.7). However, pellet transect data indicates that presence of both deer and elk has ranged between low and moderate since 2000; deer presence was at its highest in 2021. During the 2024/25 winter season the area had occasional common occurrences of collared elk (Wildlife Migration Initiative). Mountain big sagebrush utilization has been light in most sample years, but the heaviest utilization occurred in 2016. However, as a highly preferred species, alderleaf mountain mahogany has had proportionally higher utilization than mountain big sagebrush, though the population is a thirdof the size of that of sagebrush. Mahogany utilization was at its highest in 2017 with 100% of plants sampled in density strips being either moderately (33%) or heavily (67%) hedged. Utilization pressures have decreased as the population has grown in size. Cattle

and/or bison presence has been low over the sample years (Table 10-06.9, Table 10-06.13). On-site observations for 2025 noted little to no utilization on the herbaceous community.

## Trend Summary Tables

**Table 10-06.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 18.2 | 2.0 | 4.0 | - | - | - |
| 2000 | 24.2 | 0.5 | 3.9 | - | - | - |
| 2012 | 16.3 | 1.5 | 8.8 | 25.4 | 0.6 | 12.0 |
| 2015 | 17.0 | 2.6 | 0.0 | 27.0 | 2.1 | - |
| 2017 | 20.3 | 1.5 | 0.0 | 26.3 | 2.7 | 0.1 |
| 2021 | 19.5 | 2.4 | 0.0 | 29.6 | 2.4 | - |
| 2025 | 24.3 | 1.8 | 0.1 | 34.6 | 1.8 | 0.3 |

**Table 10-06.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 81 | 139 | 115 | 95 | 1.6 | 3.2 | 1.9 | 0.9 |
| 2000 | 39 | 129 | 3 | 67 | 0.1 | 2.6 | 0.0 | 1.2 |
| 2012 | 6 | 118 | 4 | 38 | 0.0 | 2.7 | 0.0 | 0.3 |
| 2015 | 103 | 175 | 17 | 72 | 3.1 | 9.2 | 0.3 | 2.1 |
| 2017 | 142 | 217 | 1 | 55 | 2.1 | 9.6 | 0.1 | 1.8 |
| 2021 | 47 | 201 | 1 | 18 | 0.3 | 4.8 | 0.0 | 0.2 |
| 2025 | 24 | 198 | 3 | 35 | 0.1 | 4.6 | 0.0 | 0.5 |

**Table 10-06.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 3.3 | 0.6 | 49.0 | 19.2 | 3.2 | 33.2 |
| 2000 | 7.8 | 1.0 | 54.2 | 25.2 | 3.1 | 31.7 |
| 2012 | 3.6 | - | 50.7 | 30.3 | 1.4 | 29.7 |
| 2015 | 6.4 | - | 61.1 | 18.3 | 2.1 | 30.4 |
| 2017 | 15.6 | 0.0 | 63.6 | 13.6 | 2.5 | 29.4 |
| 2021 | 8.2 | 0.8 | 56.4 | 21.0 | 2.2 | 25.8 |
| 2025 | 11.1 | - | 56.1 | 18.9 | 2.6 | 29.0 |

**Table 10-06.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle/Bison | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 3 | 4 | - | 9 |
| 2000 | - | 3 | 11 | - | 33 |
| 2012 | - | 12 | 9 | 2 | 5 |
| 2015 | 1 | 5 | 7 | - | 4 |
| 2017 | 1 | 10 | 17 | 2 | - |
| 2021 | 1 | 15 | 17 | - | 1 |
| 2025 | - | 11 | 14 | - | 8 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | 7.4 (18.2) | 6.0 (14.9) | - | - |
| 2012 | - | 24.8 (61.2) | 19.4 (48.0) | 2.3 (5.7) | - |
| 2015 | - | 16.8 (41.4) | 24.8 (61.2) | 1.2 (2.9) | - |
| 2017 | 1.5 (3.6) | 22.1 (54.6) | 36.2 (89.4) | 0.6 (1.4) | - |
| 2021 | 1.5 (3.6) | 24.1 (59.6) | 18.1 (44.7) | 2.9 (7.2) | - |
| 2025 | 2.2 (5.4) | 12.8 (31.5) | 11.4 (28.1) | 1.7 (4.3) | - |

**Table 10-06.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Koeleria macrantha (prairie Junegrass) | Piptatheropsis micrantha (littleseed ricegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 40 | 81 | 21 | 58 | - | - | 28 | 3 | 4 | 6 |
| 2000 | 70 | 39 | 9 | 35 | 2 | - | 3 | 2 | 16 | - |
| 2012 | 82 | 6 | 14 | 23 | - | 5 | - | - | - | 3 |
| 2015 | 90 | 103 | 18 | 65 | 2 | - | 20 | 4 | 6 | - |
| 2017 | 84 | 142 | 1 | 122 | 8 | 3 | 36 | 0 | 5 | - |
| 2021 | 99 | 47 | 10 | 71 | 30 | - | 25 | - | 1 | - |
| 2025 | 100 | 24 | 4 | 59 | 10 | 11 | 17 | 16 | - | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 1.3 | 1.6 | 0.4 | 0.7 | - | - | 0.2 | 0.0 | 0.0 | 0.5 |
| 2000 | 1.6 | 0.1 | 0.4 | 0.4 | 0.0 | - | 0.0 | 0.0 | 0.1 | - |
| 2012 | 2.2 | 0.0 | 0.2 | 0.3 | - | 0.0 | - | - | - | 0.0 |
| 2015 | 4.6 | 3.1 | 0.9 | 1.9 | 0.0 | - | 1.3 | 0.1 | 0.4 | - |
| 2017 | 4.5 | 2.1 | 0.0 | 2.2 | 0.1 | 0.6 | 2.2 | 0.0 | 0.0 | - |
| 2021 | 2.5 | 0.3 | 0.1 | 1.4 | 0.2 | - | 0.6 | - | 0.0 | - |
| 2025 | 2.8 | 0.1 | 0.0 | 0.8 | 0.1 | 0.1 | 0.4 | 0.3 | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-06.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella latifolia ssp. latifolia[a] (broadleaf gilia) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Arabis (rockcress) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium album[a] (lambsquarters) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia[a] (tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Lupinus argenteus (silvery lupine) | Machaeranthera grindelioides (rayless tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 11 | - | - | 16 | 1 | - | - | - | 3 | 1 | 74 | 23 | 1 | - | 28 | 20 | 16 |
| 2000 | - | - | 4 | 9 | - | - | - | - | - | - | - | - | - | - | 3 | - | 22 |
| 2012 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 |
| 2015 | - | - | - | 1 | - | - | 3 | 6 | 6 | - | 4 | 4 | 3 | - | - | - | 7 |
| 2017 | - | - | 3 | - | - | - | - | - | - | - | 1 | - | - | 3 | - | - | 11 |
| 2021 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | 5 |
| 2025 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.2 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | 1.5 | 0.1 | 0.0 | - | 0.1 | 0.1 | 0.6 |
| 2000 | - | - | 0.0 | 0.0 | - | - | - | - | - | - | - | - | - | - | 0.0 | - | 0.2 |
| 2012 | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 |
| 2015 | - | - | - | 0.1 | - | - | 0.0 | 0.0 | 0.1 | - | 0.2 | 0.0 | 0.0 | - | - | - | 0.2 |
| 2017 | - | - | 0.0 | - | - | - | - | - | - | - | 0.1 | - | - | 0.0 | - | - | 0.3 |
| 2021 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | 0.2 |
| 2025 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Melilotus officinalis[i] (sweetclover) | Packera multilobata (lobeleaf groundsel) | Penstemon pachyphyllus (thickleaf beardtongue) | Physaria (twinpod) | Physaria newberryi (Newberry's twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | 7 | 23 | - | - | 31 | 5 | - |
| 2000 | - | 1 | 27 | 6 | 9 | - | - |
| 2012 | - | - | 16 | - | 23 | - | - |
| 2015 | - | 5 | 37 | - | 23 | - | 1 |
| 2017 | - | - | 32 | 10 | - | - | - |
| 2021 | - | - | 8 | - | 6 | - | - |
| 2025 | - | - | 18 | - | 13 | - | - |
| year | Average Cover (%) | | | | | | |
| 1995 | 0.0 | 0.1 | - | - | 0.1 | 0.0 | - |
| 2000 | - | 0.0 | 0.8 | 0.1 | 0.1 | - | - |
| 2012 | - | - | 0.2 | - | 0.1 | - | - |
| 2015 | - | 0.0 | 1.5 | - | 0.1 | - | 0.0 |
| 2017 | - | - | 1.4 | 0.0 | - | - | - |
| 2021 | - | - | 0.0 | - | 0.0 | - | - |
| 2025 | - | - | 0.4 | - | 0.1 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-06.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Ericameria parryi var. parryi (Parry's rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Mahonia repens (creeping barberry) | Opuntia (pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Pseudotsuga menziesii[t] (Douglas-fir) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Ribes cereum var. cereum[p] (wax currant) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2012 | 0.7 | 4.3 | 3.3 | - | 0.1 | 1.1 | - | 0.2 | 3.3 | 0.9 | 0.1 | 0.2 | 7.8 | - | - | 4.2 | 0.7 |
| 2015 | 1.2 | 4.2 | 0.8 | - | - | 3.1 | - | 0.3 | - | - | 1.8 | - | - | - | - | 1.5 | 0.1 |
| 2017 | 0.8 | 3.8 | 0.5 | 0.1 | 0.4 | 3.6 | 0.2 | 0.9 | 0.1 | - | 1 | 0.1 | - | - | - | 2.4 | - |
| 2021 | 0.1 | 5.3 | 0.5 | 0.1 | 1.2 | 0.9 | - | - | - | - | 1.1 | - | - | - | - | 2.3 | 1.2 |
| 2025 | 0.1 | 7.1 | 1.5 | 0.1 | 0.3 | 2.4 | - | 0.8 | 0.3 | - | 0.6 | 0 | - | - | - | 2.4 | 0.6 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 3.5 | 3.3 | - | - | 2.0 | - | 0.0 | 2.3 | - | 1.4 | 0.6 | 1.7 | - | 0.1 | 1.2 | 1.7 |
| 2000 | 0.0 | 6.8 | 4.2 | - | 0.0 | 1.1 | - | - | 1.8 | 0.1 | 0.3 | 0.2 | 1.8 | 0.1 | - | 2.8 | 1.3 |
| 2012 | 0.8 | 4.6 | 1.8 | - | 0.4 | 0.6 | - | 0.2 | 1.8 | 0.0 | 0.2 | 0.7 | 7.0 | - | - | 2.7 | 1.3 |
| 2015 | 0.8 | 3.5 | 0.4 | - | 0.1 | 1.0 | - | 1.2 | - | - | 1.3 | 0.0 | 0.0 | 0.0 | - | 1.4 | 0.3 |
| 2017 | 0.8 | 4.7 | 0.1 | 0.1 | 0.0 | 1.9 | 0.0 | 0.4 | 0.0 | - | 0.9 | 0.0 | 0.0 | - | - | 3.1 | 0.1 |
| 2021 | 0.2 | 5.2 | 0.8 | 0.5 | 1.2 | 0.3 | - | - | - | - | 0.6 | 0.0 | 0.0 | - | - | 2.4 | 1.4 |
| 2025 | 0.6 | 5.1 | 0.7 | 0.0 | 0.4 | 0.6 | - | 0.9 | 0.1 | - | 0.5 | 0.0 | - | - | - | 1.1 | 0.7 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

| SHRUB SPECIES | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|
| year | Line |
| 1995 | - |
| 2000 | - |
| 2012 | 11.1 |
| 2015 | 16.1 |
| 2017 | 15.2 |
| 2021 | 19.3 |
| 2025 | 20.5 |
| year | Quadrat Cover (%) |
| 1995 | 6.4 |
| 2000 | 8.0 |
| 2012 | 4.6 |
| 2015 | 9.6 |
| 2017 | 9.6 |
| 2021 | 9.3 |
| 2025 | 15.6 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-06.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/29 |
| 2000 | 320 | 80 | 25 | 75 | 0 | 0 | 0 | 0 | 12/22 |
| 2012 | 1440 | - | 0 | 100 | 0 | 10 | 0 | 0 | 13/29 |
| 2015 | 660 | - | 15 | 85 | 0 | 0 | 0 | 0 | 39/46 |
| 2017 | 740 | - | 30 | 70 | 0 | 0 | 0 | 0 | 24/34 |
| 2021 | 280 | - | 7 | 79 | 14 | 29 | 7 | 21 | - / - |
| 2025 | 400 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 420 | - | 10 | 86 | 5 | 0 | 0 | 0 | 64/78 |
| 2000 | 520 | - | 12 | 89 | 0 | 4 | 0 | 0 | 82/91 |
| 2012 | 620 | - | 7 | 81 | 13 | 26 | 29 | 23 | 60/86 |
| 2015 | 360 | - | 11 | 83 | 6 | 44 | 28 | 11 | 57/94 |
| 2017 | 420 | 20 | 29 | 67 | 5 | 5 | 10 | 5 | 68/99 |
| 2021 | 600 | - | 3 | 93 | 3 | 0 | 0 | 10 | - / - |
| 2025 | 660 | - | 3 | 97 | 0 | 39 | 0 | 6 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 440 | - | 9 | 86 | 5 | 14 | 0 | 0 | 119/115 |
| 2000 | 460 | - | 26 | 74 | 0 | 30 | 9 | 0 | 124/117 |
| 2012 | 300 | - | 20 | 47 | 33 | 33 | 33 | 27 | 113/115 |
| 2015 | 320 | 40 | 50 | 50 | 0 | 0 | 56 | 0 | 81/89 |
| 2017 | 180 | - | 33 | 67 | 0 | 33 | 67 | 0 | 65/72 |
| 2021 | 240 | - | 25 | 42 | 33 | 42 | 33 | 33 | - / - |
| 2025 | 220 | - | 0 | 100 | 0 | 36 | 9 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 60 | - | 67 | 33 | 0 | 67 | 0 | 0 | 56/62 |
| 2000 | - | - | - | - | - | - | - | - | 60/39 |
| 2012 | - | - | - | - | - | - | - | - | 22/23 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/35 |
| 2017 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/35 |
| 2021 | 400 | - | 0 | 90 | 10 | 0 | 0 | 25 | - / - |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | 73/80 |
| 2012 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 100 | 69/99 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 73/98 |
| 2017 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 61/90 |
| 2021 | 460 | - | 48 | 26 | 26 | 0 | 0 | 22 | - / - |
| 2025 | 160 | - | 0 | 63 | 38 | 0 | 0 | 38 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 340 | - | 18 | 71 | 12 | 0 | 0 | 6 | 63/83 |
| 2000 | 200 | - | 10 | 80 | 10 | 0 | 10 | 10 | 82/82 |
| 2012 | 220 | - | 0 | 73 | 27 | 18 | 9 | 73 | 73/91 |
| 2015 | 280 | 20 | 0 | 100 | 0 | 43 | 14 | 0 | 66/79 |
| 2017 | 200 | 20 | 20 | 80 | 0 | 0 | 0 | 0 | 76/94 |
| 2021 | 280 | - | 21 | 71 | 7 | 7 | 7 | 7 | - / - |
| 2025 | 260 | - | 0 | 62 | 39 | 15 | 8 | 39 | - / - |
| Ericameria parryi var. parryi -- (Parry's rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2012 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 74/96 |
| 2017 | - | - | - | - | - | - | - | - | 78/87 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/22 |
| 2012 | 300 | - | 7 | 93 | 0 | 0 | 0 | 0 | 16/26 |
| 2015 | 860 | 60 | 7 | 93 | 0 | 0 | 0 | 0 | 23/30 |
| 2017 | 820 | - | 7 | 93 | 0 | 0 | 0 | 0 | 19/26 |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 2600 | 20 | 2 | 96 | 2 | 0 | 0 | 2 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2012 | 80 | 20 | 0 | 100 | 0 | 0 | 0 | 25 | - / - |
| 2015 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2017 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2021 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2012 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2017 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 1840 | - | 24 | 76 | 0 | 0 | 0 | 0 | 7/18 |
| 2000 | 720 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/11 |
| 2012 | 1600 | - | 29 | 71 | 0 | 0 | 0 | 0 | 7/9 |
| 2015 | 1560 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/22 |
| 2017 | 2420 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/11 |
| 2021 | 2200 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 3760 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 120 | - | 0 | 67 | 33 | 0 | 0 | 33 | 19/29 |
| 2000 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/31 |
| 2012 | 80 | - | 0 | 100 | 0 | 0 | 0 | 100 | 10/51 |
| 2015 | 300 | - | 13 | 87 | 0 | 0 | 0 | 0 | 9/32 |
| 2017 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/26 |
| 2021 | 280 | - | 14 | 36 | 50 | 0 | 0 | 50 | - / - |
| 2025 | 140 | - | 14 | 86 | 0 | 0 | 0 | 43 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 320 | - | 56 | 44 | 0 | 0 | 0 | 0 | - / - |
| 2012 | 300 | - | 13 | 87 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2017 | 20 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2021 | 40 | 80 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 120 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Pseudotsuga menziesii[t] -- (Douglas-fir) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2012 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2017 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 68/111 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 97/119 |
| 2012 | - | - | - | - | - | - | - | - | 54/93 |
| 2015 | - | - | - | - | - | - | - | - | 1/27 |
| 2017 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

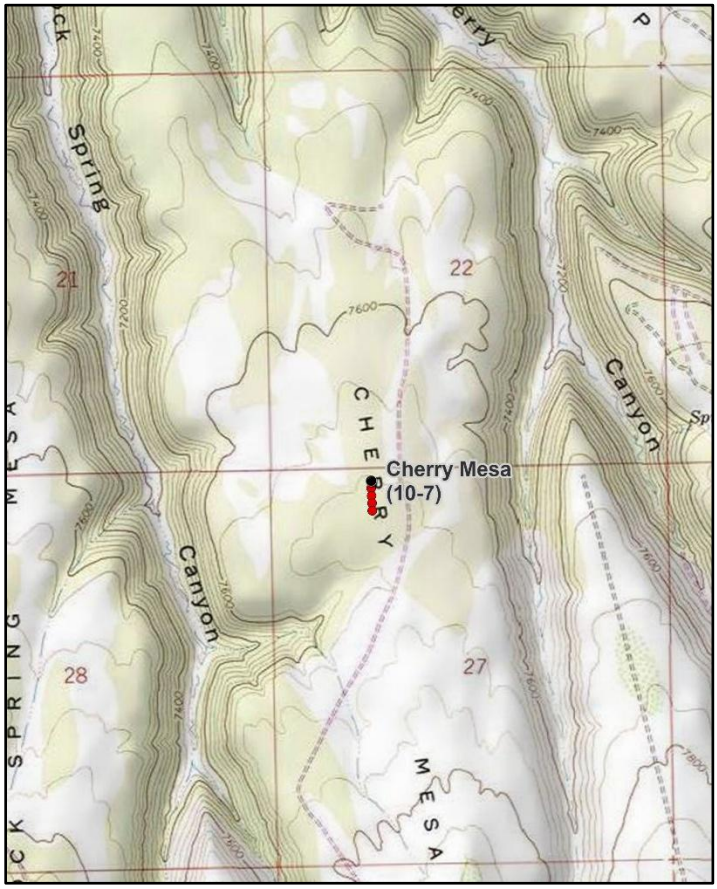
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 37/79 |
| 2000 | 1400 | - | 16 | 84 | 0 | 0 | 0 | 0 | 162/72 |
| 2012 | 820 | - | 24 | 76 | 0 | 0 | 0 | 0 | 94/51 |
| 2015 | 880 | - | 27 | 73 | 0 | 0 | 25 | 0 | 69/58 |
| 2017 | 1120 | - | 18 | 82 | 0 | 18 | 18 | 0 | 42/43 |
| 2021 | 840 | - | 26 | 62 | 12 | 17 | 0 | 12 | - / - |
| 2025 | 1220 | - | 28 | 66 | 7 | 5 | 49 | 7 | - / - |
| Ribes cereum var. cereum[p] -- (wax currant) | | | | | | | | | |
| 1995 | 80 | 60 | 0 | 100 | 0 | 0 | 0 | 0 | 91/121 |
| 2000 | 100 | - | 0 | 100 | 0 | 20 | 0 | 0 | 85/100 |
| 2012 | 100 | - | 40 | 40 | 20 | 40 | 0 | 20 | 78/89 |
| 2015 | 140 | 20 | 14 | 86 | 0 | 14 | 57 | 0 | 52/67 |
| 2017 | 100 | - | 0 | 100 | 0 | 60 | 0 | 0 | 60/72 |
| 2021 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 120 | - | 17 | 50 | 33 | 17 | 0 | 33 | - / - |
| Sambucus[p] -- (elderberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2012 | - | - | - | - | - | - | - | - | 170/130 |
| 2015 | - | - | - | - | - | - | - | - | 147/108 |
| 2017 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 1340 | - | 21 | 79 | 0 | 3 | 0 | 0 | 56/108 |
| 2000 | 2080 | 40 | 30 | 68 | 2 | 14 | 2 | 1 | 54/93 |
| 2012 | 1620 | - | 20 | 72 | 9 | 26 | 5 | 17 | 53/109 |
| 2015 | 3280 | - | 6 | 95 | 0 | 21 | 13 | 2 | 46/98 |
| 2017 | 3520 | - | 7 | 92 | 1 | 7 | 7 | 2 | 54/92 |
| 2021 | 2720 | - | 3 | 88 | 9 | 16 | 2 | 8 | - / - |
| 2025 | 2980 | 20 | 6 | 93 | 1 | 28 | 10 | 1 | - / - |

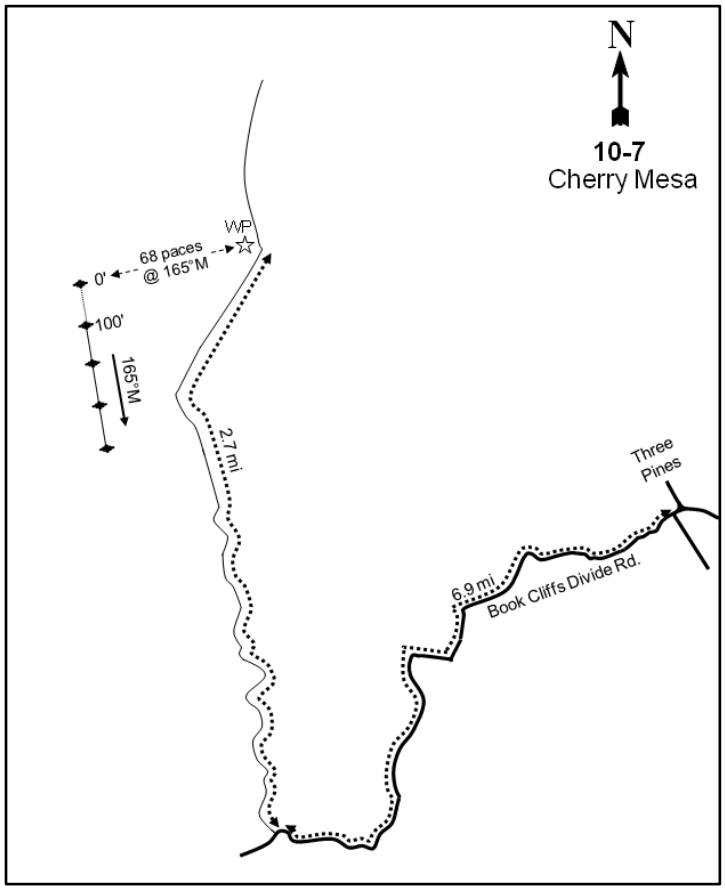
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-06.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 61 | - | - | - | - | - | 14.8 |
| 2000 | 76 | - | - | - | - | - | 15.4 |
| 2012 | 79 | 6 | 31 | 25 | 31 | 6 | 6.7 |
| 2015 | 20 | 33 | 67 | - | - | - | 3.0 |
| 2017 | 23 | 50 | 50 | - | - | - | 2.7 |
| 2021 | 29 | 25 | 75 | - | - | - | 3.8 |
| 2025 | 15 | 22 | 78 | - | - | - | 3.8 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 1 | - | 100 | - | - | - | 3.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 174 | - | - | - | - | - | 4.4 |
| 2000 | 231 | - | - | - | - | - | 5.7 |
| 2012 | 241 | - | 30 | 25 | 35 | 10 | 6.1 |
| 2015 | 3 | 33 | 67 | - | - | - | 2.3 |
| 2017 | 30 | 30 | 70 | - | - | - | 2.3 |
| 2021 | 21 | 44 | 56 | - | - | - | 2.6 |
| 2025 | 38 | 55 | 27 | 18 | - | - | 2.5 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 1995 | 3 | - | - | - | - | - | 10.0 |
| Quercus gambelii (Gambel oak) | | | | | | | |
| 1995 | 8 | - | - | - | - | - | 3.0 |

# CHERRY MESA - STUDY NO. 10-7




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cedar Camp Canyon SW; Township 16S, Range 22E, Section 27 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 630664 East 4361531 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9174 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the major intersection at Three Pines, continue southwest along the Book Cliffs Divide road for 6.9 miles. Turn right off of the main road onto Cherry Mesa Road. Drive 2.7 miles to a witness post on the left (west) side of the road. Stop, then walk west (up the ridge) 68 paces at 250 degrees magnetic to the 0-foot baseline stake, which is marked by browse tag #9174. **May need a UTV for access.**

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | MCCLELLAND |
| Elevation | 7,650ft (2,332m) |
| Aspect | North |
| Slope | 5% |
| Sample Dates | 06/20/1995, 06/18/1997, 06/22/2000, 06/16/2005, 06/17/2010, 06/09/2015, 06/09/2020, 06/11/2025 |

**Table 10-07.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Tebuthiuron | Book Cliffs Bison Habitat Enhancement Cherry Mesa | 4444 | September 2019 | 500 |
| Chaining - Chain Unknown | - | - | Historic | - |
| Mechanical - Bullhog | Cherry Mesa Bullhog | 1106 | July 2009 | 576 |

## Wildlife Habitat and Vegetation History

**Table 10-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Phase I |
| 1997 | Mountain Big Sagebrush | Phase I |
| 2000 | Mountain Big Sagebrush | Phase I |
| 2005 | Mountain Big Sagebrush | Phase I transitioning to Phase II |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Perennial Grass | Early Phase I |

## Site Notes

Elk were observed in the area in 1988, and 30 to 40 elk were seen in June of 2005.

## Soils

**Table 10-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 6.8 | 48.0 | 30.0 | 22.0 | 4.1 | 9.4 | 89.6 | 0.8 | 12/18/2000 |
| Sandy Loam | 7.3 | 53.0 | 27.8 | 19.2 | 5.2 | 14.9 | 153.6 | 0.6 | 06/18/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1988-2020 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1<br>2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.2 |

From study establishment in 1988 through the 2020 sample year, the vegetation on this site remained in a relatively stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant plant species (Photos, Pre-1992 Data, Table 10-07.12). In 2019, however, a herbicide treatment occurred that targeted sagebrush in the area (Table 10-07.1), and poor vigor among the population had notably increased in 2020. In 2025, sagebrush density decreased (Table 10-07.12) as a result of the herbicide while perennial grasses increased and became the sole dominant vegetation component. The herbaceous understory in general has remained diverse throughout the study period, with mainly native perennial grasses providing much of the cover. Forbs have generally remained rare (Table 10-07.7, Table 10-07.10, Table 10-07.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees increased in abundance from study establishment through the 2005 sample year; a 2009 bullhog treatment removed nearly all of the pinyon and juniper in the area (Table 10-07.1, Table 10-07.12). Point-quarter data shows that pinyon and juniper have persisted with low density following treatment, indicating that future infilling may be possible over time (Table 10-07.14). However, the site has been considered to be within Early Phase I of woodland encroachment since 2010 (Table 10-07.4), indicating that infilling may not be an immediate concern.

The abundant grass and forb communities on this site may provide forage for elk and deer during the summer months (Table 10-07.3, Table 10-07.6). However, pellet transect data indicates that elk and deer presence has generally been low since 2000; deer presence

was at its highest in 2005 (Table 10-07.9). Utilization of mountain big sagebrush has been light in most sample years, but the percentage of plants sampled in density strips being moderately to heavily hedged reached 78% in 2015. Utilization of longflower rabbitbrush (*Chrysothamnus depressus*) showed a similar trend to sagebrush with its highest utilization rate (89%) also occurring in 2015 (Table 10-05.13). On-site observations in 2025 noted light utilization (10-20%) on Indian ricegrass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), and prairie Junegrass (*Koeleria macrantha*), but little to no utilization on forb species.

## Trend Summary Tables

**Table 10-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 14.1 | 0.2 | 4.0 | - | - | - |
| 1997 | 10.8 | 0.5 | 4.7 | - | - | - |
| 2000 | 14.7 | 0.0 | 6.4 | - | - | - |
| 2005 | 14.7 | 0.2 | 8.8 | 20.7 | 0.6 | 12.5 |
| 2010 | 13.1 | 0.0 | 0.1 | 17.8 | 0.2 | 0.1 |
| 2015 | 16.7 | 0.1 | - | 28.2 | 0.2 | - |
| 2020 | 20.2 | 0.1 | - | 28.0 | 0.5 | - |
| 2025 | 5.4 | 0.7 | - | 6.0 | 0.4 | - |

**Table 10-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 2 | 352 | 215 | 248 | 0.0 | 5.4 | 1.0 | 4.1 |
| 1997 | 3 | 319 | 96 | 203 | 0.0 | 4.4 | 0.3 | 2.9 |
| 2000 | - | 350 | 12 | 162 | - | 6.7 | 0.1 | 2.2 |
| 2005 | 4 | 321 | 144 | 155 | 0.0 | 8.4 | 0.7 | 2.3 |
| 2010 | - | 304 | 99 | 139 | - | 6.7 | 1.1 | 1.8 |
| 2015 | 10 | 348 | 94 | 229 | 0.1 | 10.4 | 0.8 | 4.9 |
| 2020 | 24 | 322 | 68 | 169 | 0.0 | 6.2 | 0.2 | 3.7 |
| 2025 | 53 | 380 | 91 | 133 | 1.4 | 19.0 | 0.7 | 3.0 |

**Table 10-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 9.1 | 0.2 | 41.1 | 18.1 | 0.9 | 31.5 |
| 1997 | 15.1 | 1.2 | 41.2 | 27.7 | 0.2 | 21.0 |
| 2000 | 25.3 | 0.4 | 41.0 | 18.3 | 0.0 | 29.2 |
| 2005 | 26.9 | 0.3 | 36.7 | 20.9 | 0.0 | 31.8 |
| 2010 | 19.3 | 0.1 | 52.6 | 14.8 | - | 24.4 |
| 2015 | 17.6 | 0.1 | 47.0 | 16.8 | 0.0 | 31.6 |
| 2020 | 22.7 | 0.9 | 51.1 | 9.3 | 0.1 | 27.0 |
| 2025 | 32.0 | 1.0 | 40.2 | 10.1 | 0.3 | 28.7 |

**Table 10-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 1 | 4 | 4 | - | 12 |
| 1997 | 7 | 7 | 8 | - | 11 |
| 2000 | 2 | 10 | 9 | - | 48 |
| 2005 | - | 22 | 13 | - | 58 |
| 2010 | - | 11 | 8 | - | 12 |
| 2015 | 2 | 12 | 13 | - | 22 |
| 2020 | - | 5 | 10 | - | 9 |
| 2025 | 2 | 7 | 19 | 1 | 9 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 1997 | - | - | - | - | - |
| 2000 | 5.8 (14.3) | 21.5 (53.0) | 14.7 (36.4) | - | - |
| 2005 | 3.6 (9.0) | 22.1 (54.6) | 19.4 (48.0) | - | - |
| 2010 | 2.2 (5.4) | 9.4 (23.2) | 14.1 (34.8) | - | - |
| 2015 | 16.0 (39.5) | 14.7 (36.4) | 14.7 (36.4) | - | - |
| 2020 | 6.5 (16.1) | 13.4 (33.1) | 23.4 (57.9) | - | - |
| 2025 | 5.1 (12.6) | 10.7 (26.5) | 20.1 (49.7) | 2.3 (5.7) | - |

**Table 10-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 12 | 58 | 2 | 98 | 19 | 183 | 1 | 91 | - | 78 | - | - |
| 1997 | 2 | 46 | 3 | 72 | 11 | 202 | 7 | 37 | - | 140 | 9 | - |
| 2000 | - | 61 | - | 173 | 1 | 97 | 3 | 3 | - | 198 | 1 | - |
| 2005 | 0 | 55 | 4 | 154 | 7 | 62 | 10 | 44 | - | 137 | 16 | - |
| 2010 | 3 | 53 | - | 77 | 11 | 80 | - | 41 | - | 168 | 4 | - |
| 2015 | 8 | 67 | 10 | 207 | 20 | 87 | 15 | 51 | - | 142 | 12 | - |
| 2020 | 12 | 48 | 24 | 112 | 22 | 133 | - | 14 | 17 | 61 | 90 | 21 |
| 2025 | 6 | 84 | 53 | 245 | 65 | 107 | 4 | 38 | 92 | 16 | 7 | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.1 | 0.8 | 0.0 | 0.4 | 0.1 | 1.2 | 0.0 | 1.1 | - | 1.7 | - | - |
| 1997 | 0.0 | 0.4 | 0.0 | 0.5 | 0.1 | 1.3 | 0.0 | 0.6 | - | 1.3 | 0.2 | - |
| 2000 | - | 0.7 | - | 2.2 | 0.0 | 0.5 | 0.0 | 0.0 | - | 3.2 | 0.0 | - |
| 2005 | 0.0 | 1.4 | 0.0 | 1.6 | 0.1 | 0.8 | 0.1 | 0.6 | - | 3.6 | 0.3 | - |
| 2010 | 0.0 | 1.0 | - | 1.2 | 0.2 | 0.9 | - | 0.6 | - | 2.7 | 0.2 | - |
| 2015 | 0.2 | 2.0 | 0.1 | 2.4 | 0.2 | 0.9 | 0.1 | 1.2 | - | 3.1 | 0.1 | - |
| 2020 | 0.1 | 0.4 | 0.0 | 1.1 | 0.5 | 1.5 | - | 0.1 | 0.2 | 0.6 | 1.2 | 0.4 |
| 2025 | 0.2 | 4.7 | 1.4 | 6.8 | 1.7 | 3.0 | 0.4 | 0.7 | 1.1 | 0.2 | 0.2 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Arabis (rockcress) | Arenaria kingii (King's sandwort) | Astragalus (milkvetch) | Astragalus argophyllus (silverleaf milkvetch) | Astragalus tenellus (looseflower milkvetch) | Calochortus flexuosus (winding mariposa lily) | Castilleja flava (yellow Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 24 | 1 | - | - | 35 | - | - | 12 | 21 | - | - | - | 58 | 57 |
| 1997 | - | - | 44 | 31 | 4 | 4 | 13 | - | - | 3 | 9 | 10 | - | - | - | 39 | 63 |
| 2000 | - | - | 6 | 44 | - | - | - | 6 | 3 | - | 4 | - | - | - | - | 40 | 37 |
| 2005 | - | - | 32 | 29 | 4 | - | - | - | 3 | - | 4 | 4 | - | 10 | - | 21 | 32 |
| 2010 | - | - | 18 | 30 | 1 | 1 | - | 4 | - | - | 5 | 2 | 5 | 1 | - | 36 | 23 |
| 2015 | - | 3 | 62 | 34 | 9 | 1 | - | 4 | 13 | - | 3 | 2 | - | - | 4 | 20 | 28 |
| 2020 | 3 | 2 | - | 43 | 9 | - | - | 5 | 9 | - | - | - | - | - | - | 16 | 21 |
| 2025 | - | 57 | 9 | 29 | 7 | - | - | 11 | 4 | - | - | - | 5 | - | - | 11 | 5 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | 0.1 | 0.0 | - | - | 0.7 | - | - | 0.2 | 0.0 | - | - | - | 0.4 | 0.3 |
| 1997 | - | - | 0.1 | 0.5 | 0.0 | 0.0 | 0.1 | - | - | 0.0 | 0.1 | 0.0 | - | - | - | 0.2 | 0.5 |
| 2000 | - | - | 0.0 | 0.4 | - | - | - | 0.1 | 0.0 | - | 0.0 | - | - | - | - | 0.3 | 0.2 |
| 2005 | - | - | 0.1 | 0.4 | 0.0 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.1 | 0.2 |
| 2010 | - | - | 0.0 | 0.6 | 0.0 | 0.0 | - | 0.2 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.1 |
| 2015 | - | 0.0 | 0.7 | 0.8 | 0.0 | 0.0 | - | 0.0 | 0.1 | - | 0.1 | 0.0 | - | - | 0.0 | 0.1 | 0.3 |
| 2020 | 0.0 | 0.0 | - | 0.8 | 0.0 | - | - | 0.0 | 0.2 | - | - | - | - | - | - | 0.1 | 0.3 |
| 2025 | - | 0.4 | 0.0 | 1.0 | 0.0 | - | - | 0.1 | 0.0 | - | - | - | 0.0 | - | - | 0.1 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gilia inconspicua[a] (shy gilia) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Pedicularis centranthera (dwarf lousewort) | Penstemon caespitosus (mat penstemon) | Penstemon pachyphyllus (thickleaf beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 6 | 2 | 39 | - | 17 | 61 | 125 | - | 8 | - | 19 | 3 | - | 28 | 1 | 28 | 112 |
| 1997 | 2 | - | 21 | - | 15 | - | - | - | 11 | 2 | 13 | - | 1 | 12 | 2 | 28 | 73 |
| 2000 | 1 | - | 26 | 2 | 34 | 2 | 3 | - | - | 5 | 6 | - | - | 1 | 1 | 24 | 38 |
| 2005 | - | - | 23 | 7 | 21 | 78 | - | - | 7 | - | 5 | 3 | - | 4 | - | 18 | 32 |
| 2010 | - | 4 | 6 | 6 | 13 | 66 | - | - | 3 | - | 1 | 5 | - | - | 1 | 27 | 21 |
| 2015 | 6 | - | 11 | 1 | 3 | 15 | - | 3 | 15 | 5 | - | 8 | - | 3 | 1 | 38 | 45 |
| 2020 | - | - | 31 | 3 | 13 | 33 | - | - | 7 | - | 2 | 1 | - | 3 | - | 29 | 64 |
| 2025 | 7 | - | 18 | - | 4 | 24 | - | - | 28 | - | - | - | - | - | - | 24 | 49 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.3 | - | 0.2 | 0.4 | 0.3 | - | 0.0 | - | 0.4 | 0.0 | - | 0.6 | 0.0 | 0.3 | 0.3 |
| 1997 | 0.0 | - | 0.1 | - | 0.2 | - | - | - | 0.0 | 0.0 | 0.1 | - | 0.0 | 0.2 | 0.0 | 0.3 | 0.3 |
| 2000 | 0.0 | - | 0.1 | 0.0 | 0.2 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.4 | 0.1 |
| 2005 | - | - | 0.1 | 0.0 | 0.3 | 0.3 | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.5 | 0.1 |
| 2010 | - | 0.0 | 0.1 | 0.0 | 0.1 | 0.9 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.3 | 0.0 |
| 2015 | 0.0 | - | 0.2 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.1 | 0.0 | - | 0.1 | - | 0.0 | 0.0 | 0.8 | 0.1 |
| 2020 | - | - | 0.1 | 0.1 | 0.5 | 0.1 | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.1 | - | 1.0 | 0.3 |
| 2025 | 0.2 | - | 0.2 | - | 0.2 | 0.1 | - | - | 0.2 | - | - | - | - | - | - | 0.8 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Senecio integerrimus[a] (lambstongue ragwort) | Symphyotrichum (aster) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 46 | 102 | - | 3 | - |
| 1997 | 37 | 65 | - | 1 | - |
| 2000 | 18 | 1 | - | 5 | - |
| 2005 | 60 | 68 | 7 | - | - |
| 2010 | 15 | 38 | - | - | - |
| 2015 | 145 | 4 | 1 | - | 2 |
| 2020 | 17 | 40 | - | - | - |
| 2025 | 23 | 1 | - | - | - |
| year | Average Cover (%) | | | | |
| 1995 | 0.2 | 0.3 | - | 0.0 | - |
| 1997 | 0.2 | 0.1 | - | 0.0 | - |
| 2000 | 0.1 | 0.0 | - | 0.0 | - |
| 2005 | 0.5 | 0.1 | 0.1 | - | - |
| 2010 | 0.1 | 0.1 | - | - | - |
| 2015 | 2.0 | 0.0 | 0.0 | - | 0.0 |
| 2020 | 0.0 | 0.1 | - | - | - |
| 2025 | 0.2 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia fragilis (brittle pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - |
| 1997 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 17.6 | 0.1 | 0.3 | 0.3 | 0.1 | 3.4 | 0.2 | 9.1 | 0.4 | 2.3 |
| 2010 | 15.1 | - | 0.5 | 0.2 | - | 0.1 | 0 | - | 0.2 | 2 |
| 2015 | 23 | - | 0.3 | 0.1 | 0 | - | 0.1 | - | 0.7 | 4.2 |
| 2020 | 23 | - | 0.4 | 0.2 | 0.1 | - | 0.2 | - | 1.4 | 3.2 |
| 2025 | 1.9 | - | 0.8 | 0.1 | 0.3 | - | - | - | 1.5 | 1.8 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1995 | 9.9 | 0.2 | 1.0 | - | 0.2 | 0.9 | 0.0 | 3.0 | 0.0 | 3.0 |
| 1997 | 8.2 | 0.0 | 0.8 | 0.4 | 0.1 | 1.5 | - | 3.2 | 0.1 | 1.6 |
| 2000 | 11.7 | 0.4 | 0.8 | 0.0 | 0.0 | 2.3 | - | 4.1 | 0.1 | 1.6 |
| 2005 | 11.5 | 0.6 | 0.4 | 0.1 | 0.0 | 3.0 | 0.2 | 5.8 | 0.3 | 1.8 |
| 2010 | 10.7 | - | 0.4 | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.5 | 1.6 |
| 2015 | 14.3 | - | 0.3 | 0.1 | 0.0 | - | 0.0 | - | 0.3 | 1.7 |
| 2020 | 15.8 | - | 0.6 | 0.0 | 0.0 | - | 0.1 | - | 1.4 | 2.4 |
| 2025 | 2.4 | - | 0.4 | 0.1 | 0.5 | - | 0.1 | - | 1.2 | 1.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 4180 | 760 | 37 | 63 | 1 | 2 | 1 | 0 | 65/78 |
| 1997 | 3360 | 80 | 33 | 66 | 1 | 23 | 3 | 4 | 71/85 |
| 2000 | 4240 | 60 | 16 | 75 | 10 | 24 | 18 | 17 | 70/78 |
| 2005 | 3580 | 9640 | 8 | 60 | 32 | 27 | 10 | 9 | 65/80 |
| 2010 | 3360 | 400 | 20 | 70 | 10 | 19 | 0 | 7 | 74/91 |
| 2015 | 3660 | 80 | 20 | 68 | 12 | 57 | 21 | 15 | 62/82 |
| 2020 | 3160 | - | 8 | 63 | 29 | 11 | 12 | 73 | 68/87 |
| 2025 | 1000 | - | 42 | 36 | 22 | 10 | 12 | 20 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 84/73 |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 57/36 |
| 2000 | 60 | - | 67 | 33 | 0 | 0 | 33 | 0 | 84/97 |
| 2005 | 60 | - | 67 | 33 | 0 | 0 | 67 | 0 | 81/85 |
| 2010 | 40 | - | 0 | 50 | 50 | 50 | 50 | 50 | 73/67 |
| 2015 | 40 | - | 50 | 0 | 50 | 0 | 100 | 50 | 61/62 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 68/76 |
| 2025 | 40 | - | 50 | 50 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 1280 | 20 | 0 | 95 | 5 | 2 | 0 | 0 | 16/31 |
| 1997 | 1120 | - | 0 | 100 | 0 | 2 | 0 | 0 | 13/24 |
| 2000 | 1740 | 20 | 14 | 61 | 25 | 20 | 9 | 14 | 7/14 |
| 2005 | 1140 | - | 7 | 81 | 12 | 46 | 21 | 12 | 10/19 |
| 2010 | 900 | 20 | 13 | 82 | 4 | 0 | 0 | 2 | 10/22 |
| 2015 | 700 | - | 9 | 89 | 3 | 6 | 83 | 3 | 9/24 |
| 2020 | 1080 | 20 | 6 | 80 | 15 | 39 | 37 | 26 | 11/24 |
| 2025 | 560 | - | 0 | 93 | 7 | 11 | 32 | 11 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 43/64 |
| 1997 | 340 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/30 |
| 2000 | 320 | - | 13 | 81 | 6 | 56 | 0 | 6 | 24/18 |
| 2005 | 200 | 80 | 30 | 50 | 20 | 30 | 0 | 0 | 21/23 |
| 2010 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/26 |
| 2015 | 360 | - | 44 | 44 | 11 | 28 | 22 | 11 | 22/25 |
| 2020 | 180 | - | 0 | 89 | 11 | 22 | 0 | 22 | 23/27 |
| 2025 | 120 | - | 17 | 83 | 0 | 17 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/30 |
| 1997 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/18 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 120 | - | 0 | 100 | 0 | 17 | 0 | 0 | 14/17 |
| 2010 | 280 | 40 | 43 | 57 | 0 | 0 | 0 | 0 | 12/19 |
| 2015 | 80 | - | 25 | 75 | 0 | 25 | 0 | 0 | 10/13 |
| 2020 | 160 | - | 0 | 88 | 13 | 13 | 0 | 13 | 11/14 |
| 2025 | 560 | - | 0 | 100 | 0 | 11 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 120 | - | 0 | 100 | 0 | 0 | 0 | 17 | - / - |
| 2005 | 200 | - | 10 | 80 | 10 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 4/17 |
| 1997 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/22 |
| 2000 | 140 | - | 14 | 71 | 14 | 0 | 0 | 14 | 11/29 |
| 2005 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/24 |
| 2010 | 100 | - | 0 | 80 | 20 | 0 | 0 | 20 | 5/18 |
| 2015 | 320 | - | 25 | 69 | 6 | 0 | 0 | 13 | 5/32 |
| 2020 | 140 | - | 0 | 100 | 0 | 0 | 0 | 71 | 6/22 |
| 2025 | 140 | - | 43 | 29 | 29 | 0 | 0 | 29 | - / - |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 19/35 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 1997 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 100 | - | 20 | 80 | 0 | 20 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 39/97 |
| 1997 | 280 | - | 21 | 79 | 0 | 36 | 14 | 0 | 37/73 |
| 2000 | 240 | - | 0 | 100 | 0 | 33 | 25 | 0 | 32/85 |
| 2005 | 280 | - | 7 | 86 | 7 | 29 | 21 | 0 | 23/58 |
| 2010 | 180 | - | 33 | 67 | 0 | 22 | 44 | 0 | 32/69 |
| 2015 | 200 | - | 0 | 90 | 10 | 0 | 100 | 10 | 25/78 |
| 2020 | 220 | - | 0 | 100 | 0 | 36 | 46 | 0 | 41/94 |
| 2025 | 260 | - | 0 | 92 | 8 | 54 | 46 | 8 | - / - |

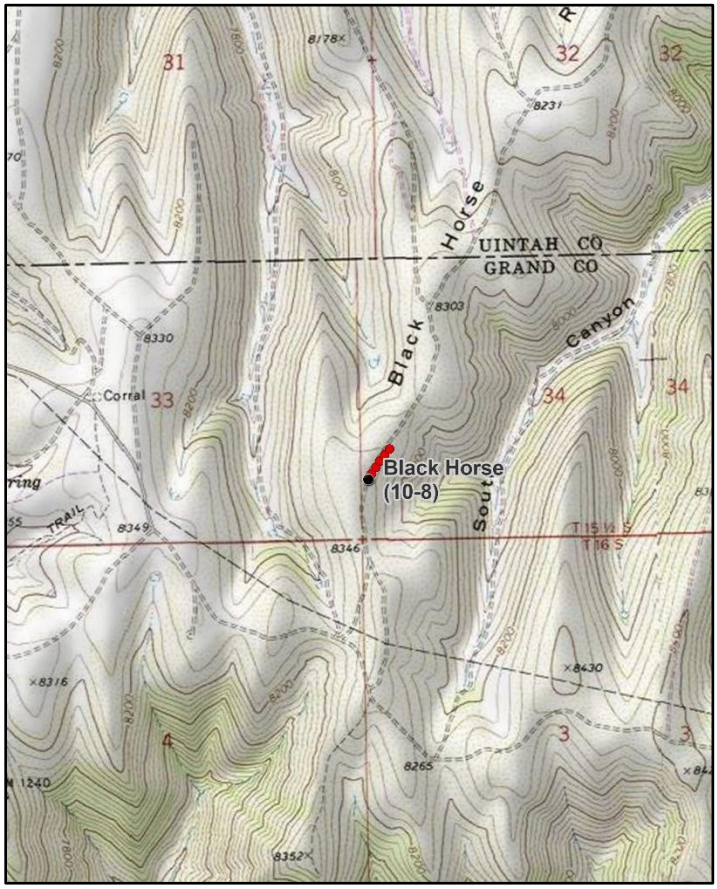
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 500 | - | 8 | 92 | 0 | 8 | 0 | 0 | 49/87 |
| 1997 | 700 | 40 | 23 | 77 | 0 | 20 | 6 | 0 | 39/68 |
| 2000 | 1040 | - | 40 | 56 | 4 | 12 | 2 | 0 | 41/60 |
| 2005 | 1260 | - | 32 | 52 | 16 | 3 | 3 | 5 | 31/52 |
| 2010 | 1720 | 40 | 48 | 52 | 0 | 0 | 0 | 0 | 26/39 |
| 2015 | 1220 | - | 12 | 89 | 0 | 31 | 0 | 2 | 31/56 |
| 2020 | 1240 | - | 8 | 79 | 13 | 24 | 5 | 26 | 34/51 |
| 2025 | 760 | - | 16 | 82 | 3 | 42 | 8 | 5 | - / - |

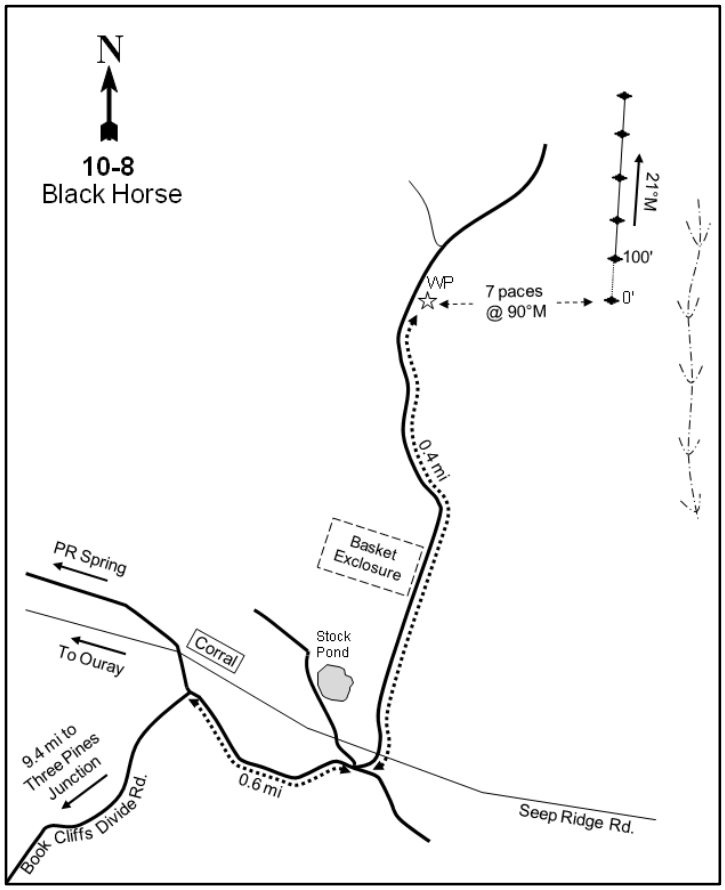
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-07.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 67 | - | - | - | - | - | 7.0 |
| 2000 | 86 | - | - | - | - | - | 12.7 |
| 2005 | 77 | - | 26 | 47 | 16 | 11 | 16.4 |
| 2010 | 12 | 14 | 86 | - | - | - | 2.6 |
| 2015 | 13 | 13 | 88 | - | - | - | 5.8 |
| 2020 | 17 | 11 | 67 | 22 | - | - | 5.8 |
| 2025 | 19 | - | 33 | 67 | - | - | 5.8 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 1 | - | - | 100 | - | - | 4.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 31 | - | - | - | - | - | 9.1 |
| 2000 | 49 | - | - | - | - | - | 10.6 |
| 2005 | 29 | - | 9 | 9 | 27 | 55 | 12.4 |
| 2010 | 3 | - | 100 | - | - | - | 2.5 |
| 2020 | 7 | 50 | 50 | - | - | - | 2.5 |
| 2025 | 2 | - | 100 | - | - | - | 4.0 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2010 | 3 | - | 50 | - | - | 50 | 13.0 |
| 2015 | 1 | - | - | - | - | 100 | 29.0 |
| 2020 | 1 | - | - | - | - | 100 | 28.0 |

# BLACK HORSE - STUDY NO. 10-8




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | P R Spring NE; Township 15S, Range 24E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 649346 East 4368607 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9039 |
| Transect Bearing | 21° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Belt 1: Centered at 40 feet. |

## Directions to Site

At 0.6 miles southeast of the intersection of the Seep Ridge and Book Cliff Divide roads, a road turns north off of the divide road and leads up Black Horse Ridge. Go up this road 0.4 miles to a witness post on the right (east) side of the road; the study site is on the east slope of the ridge. From the witness post, walk 7 paces at a bearing of 90 degrees magnetic to the 0-foot baseline stake, which is marked by browse tag #9039. The frequency baseline runs parallel to the road, and study markers are 18 inch green metal fenceposts.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SWEET WATER |
| Elevation | 8,300ft (2,530m) |
| Aspect | East |
| Slope | 10% |
| Sample Dates | 06/26/1995, 06/08/2000, 06/15/2005, 06/16/2010, 07/14/2015, 08/17/2020, 06/23/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-08.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10-08.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Mixed Mountain Brush | No Encroachment |
| 1995 | Mixed Mountain Brush | No Encroachment |
| 2000 | Mixed Mountain Brush | Early Phase I |
| 2005 | Mixed Mountain Brush | Early Phase I |
| 2010 | Mixed Mountain Brush | Early Phase I |
| 2015 | Mixed Mountain Brush | Early Phase I |
| 2020 | Mixed Mountain Brush | Early Phase I |
| 2025 | Mixed Mountain Brush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-08.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay | 6.8 | 26.0 | 33.4 | 40.6 | 4.4 | 10.8 | 252.8 | 0.8 | 06/08/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1988, the plant community on this site has remained in a stable state and has been mainly comprised of mixed mountain brush species such as mountain snowberry (*Symphoricarpos oreophilus*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), alderleaf mountain mahogany (*Cercocarpus montanus*), and gambel oak (*Quercus gambelii*), among others (Photos, Pre-1992 Data, Table 10-08.12). The herbaceous understory has remained abundant and diverse throughout the sample period, with mainly native perennial grasses contributing much of the cover (Table 10-08.7, Table 10-08.10). Rocky Mountain juniper (*Juniperus scopulorum*) was first observed in 2000 and the site has been in Early Phase I of woodland succession since that time. There may be potential for further infilling in the future, but this is likely not an immediate threat (Table 10-08.4, Table 10-08.12, Table 10-08.13, Table 10-08.14).

The abundant grass and forb communities on this site may provide forage for elk and deer during the summer months (Table 10-08.3, Table 10-08.6). Pellet transect data indicates that elk presence has ranged between low and moderate since 2000. Presence of mule deer has been moderate to high over the same time period and was at its highest in 2005. During the 2024/25 winter season the area had dispersed, but common occurrences of collared elk (Wildlife Migration Initiative). The highest percentages of alderleaf mountain mahogany utilization correlate with years of highest deer presence (Table 10-08.9, Table 10-08.13). On-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 10-08.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 34.6 | 4.8 | - | - | - | - |
| 2000 | 34.9 | 4.8 | - | - | - | - |
| 2005 | 35.4 | 7.1 | - | 46.3 | 6.1 | - |
| 2010 | 27.3 | 4.0 | - | 45.9 | 8.8 | 0.2 |
| 2015 | 36.8 | 11.9 | 0.0 | 57.8 | 16.2 | 0.4 |
| 2020 | 42.8 | 6.9 | - | 54.9 | 8.4 | 0.4 |
| 2025 | 38.2 | 7.6 | - | 57.1 | 9.2 | 0.4 |

**Table 10-08.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 3 | 392 | 50 | 350 | 0.0 | 15.7 | 0.2 | 10.2 |
| 2000 | - | 415 | 5 | 291 | - | 16.4 | 0.0 | 9.3 |
| 2005 | - | 397 | 52 | 272 | - | 17.8 | 0.3 | 11.3 |
| 2010 | - | 400 | 25 | 276 | - | 14.2 | 0.2 | 6.2 |
| 2015 | - | 437 | 27 | 286 | - | 34.3 | 0.1 | 10.7 |
| 2020 | - | 398 | 114 | 260 | - | 14.9 | 0.5 | 5.4 |
| 2025 | - | 403 | 10 | 264 | - | 18.1 | 0.0 | 5.9 |

**Table 10-08.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 10.7 | 0.1 | 53.6 | 0.5 | 6.1 | 55.0 |
| 2000 | 12.1 | 0.0 | 56.1 | 1.5 | 4.6 | 61.6 |
| 2005 | 14.7 | 0.1 | 39.2 | 3.8 | 4.9 | 57.3 |
| 2010 | 14.7 | - | 51.0 | 1.8 | 2.9 | 58.5 |
| 2015 | 12.2 | 0.0 | 57.0 | 3.1 | 4.5 | 65.1 |
| 2020 | 13.1 | - | 44.6 | 2.0 | 5.0 | 55.2 |
| 2025 | 12.7 | - | 55.2 | 2.6 | 4.5 | 55.5 |

**Table 10-08.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 6 | 19 | - | 5 |
| 2000 | - | 16 | 4 | 13 |
| 2005 | 4 | 35 | 1 | 14 |
| 2010 | 3 | 12 | 10 | 1 |
| 2015 | 2 | 19 | 3 | 14 |
| 2020 | 6 | 29 | 6 | 4 |
| 2025 | 6 | 31 | 8 | 5 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 3.6 (9.0) | 57.0 (140.7) | 22.1 (54.6) | - |
| 2005 | 11.6 (28.7) | 86.4 (213.5) | 5.3 (13.2) | - |
| 2010 | 13.8 (34.1) | 53.0 (130.8) | 4.0 (9.9) | - |
| 2015 | 1.5 (3.6) | 34.9 (86.1) | 4.0 (9.9) | - |
| 2020 | 24.0 (59.2) | 44.9 (110.9) | 19.4 (48.0) | - |
| 2025 | 9.4 (23.3) | 50.9 (125.8) | 13.4 (33.1) | - |

**Table 10-08.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus porteri (Porter brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Carex geyeri (Geyer's sedge) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Elymus trachycaulus (slender wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Phleum pratense[i] (timothy) | Poa fendleriana (muttongrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 25 | - | - | 78 | 3 | 264 | - | - | - | 14 | 120 | - | - | 4 | - | 35 |
| 2000 | - | 69 | - | 7 | 29 | - | 270 | - | - | - | 7 | 144 | - | - | 16 | 9 | 49 |
| 2005 | - | 25 | 10 | - | - | - | 169 | - | - | - | - | 151 | - | 5 | 18 | - | 101 |
| 2010 | - | 10 | 3 | - | - | - | 161 | - | - | - | - | 139 | - | 5 | - | - | 99 |
| 2015 | 6 | 38 | 6 | - | 10 | - | 226 | - | - | - | 6 | 224 | - | 21 | 4 | - | 86 |
| 2020 | - | 55 | 8 | - | 7 | - | 277 | 46 | - | - | 8 | 176 | - | 19 | 12 | 26 | 42 |
| 2025 | - | 78 | 14 | 1 | - | - | - | 166 | 36 | 82 | 3 | 120 | 1 | 65 | 5 | - | 14 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.7 | - | - | 1.0 | 0.0 | 9.3 | - | - | - | 0.3 | 1.6 | - | - | 0.0 | - | 1.2 |
| 2000 | - | 1.1 | - | 0.0 | 0.2 | - | 9.6 | - | - | - | 0.0 | 1.9 | - | - | 0.3 | 0.3 | 0.5 |
| 2005 | - | 0.5 | 0.2 | - | - | - | 7.6 | - | - | - | - | 2.4 | - | 0.4 | 0.5 | - | 2.6 |
| 2010 | - | 0.1 | 0.0 | - | - | - | 5.7 | - | - | - | - | 1.2 | - | 0.1 | - | - | 2.0 |
| 2015 | 0.1 | 1.7 | 0.1 | - | 0.2 | - | 10.0 | - | - | - | 0.2 | 8.2 | - | 0.7 | 0.1 | - | 2.2 |
| 2020 | - | 1.3 | 0.4 | - | 0.0 | - | 8.0 | 1.6 | - | - | 0.1 | 1.7 | - | 0.3 | 0.1 | 0.8 | 0.3 |
| 2025 | - | 2.1 | 0.2 | 0.0 | - | - | - | 4.8 | 0.5 | 2.6 | 0.0 | 1.5 | 0.0 | 2.9 | 0.1 | - | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

| GRASS SPECIES | Poa pratensis[i] (Kentucky bluegrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|
| year | Nested | |
| 1995 | 62 | - |
| 2000 | 73 | - |
| 2005 | 141 | - |
| 2010 | 185 | - |
| 2015 | 191 | 10 |
| 2020 | 47 | - |
| 2025 | 93 | - |
| year | Average Cover (%) | |
| 1995 | 1.7 | - |
| 2000 | 2.4 | - |
| 2005 | 3.6 | - |
| 2010 | 5.1 | - |
| 2015 | 10.8 | 0.2 |
| 2020 | 0.5 | - |
| 2025 | 3.3 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-08.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium (onion) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Arabis (rockcress) | Arenaria congesta (ballhead sandwort) | Astragalus miser (timber milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus gunnisonii (Gunnison's mariposa lily) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Chenopodium[a] (goosefoot) | Cirsium pulcherrimum (Wyoming thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Delphinium nuttallianum (twolobe larkspur) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 50 | 4 | - | 1 | - | 115 | 108 | 18 | - | 7 | 6 | 3 | 26 | 4 | 38 | 55 | 8 |
| 2000 | 33 | 28 | - | 3 | 6 | 80 | 122 | 23 | - | 3 | 17 | - | 11 | - | 20 | 30 | - |
| 2005 | 28 | 33 | - | 2 | - | 117 | 103 | 16 | - | - | 1 | - | 2 | - | 40 | 9 | 16 |
| 2010 | 25 | 45 | - | 2 | 1 | 79 | 93 | 6 | - | - | 4 | - | 6 | 4 | 31 | 9 | 6 |
| 2015 | 40 | 7 | 6 | 9 | 1 | 87 | 80 | 6 | 0 | - | - | - | 5 | - | 21 | 14 | - |
| 2020 | 25 | - | 6 | 1 | - | 78 | 81 | - | - | - | - | - | 7 | - | 30 | - | - |
| 2025 | 14 | 3 | - | 1 | - | 90 | 90 | 2 | - | 2 | - | - | 11 | - | 24 | 11 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.6 | 0.0 | - | 0.0 | - | 1.3 | 3.5 | 0.7 | - | 0.1 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 0.3 | 0.0 |
| 2000 | 0.2 | 0.2 | - | 0.0 | 0.2 | 0.7 | 4.5 | 0.7 | - | 0.0 | 0.1 | - | 0.4 | - | 0.1 | 0.3 | - |
| 2005 | 0.5 | 0.7 | - | 0.0 | - | 1.9 | 3.1 | 0.9 | - | - | 0.0 | - | 0.2 | - | 0.2 | 0.1 | 0.1 |
| 2010 | 0.2 | 0.2 | - | 0.0 | 0.0 | 1.0 | 2.3 | 0.1 | - | - | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| 2015 | 0.7 | 0.4 | 0.1 | 0.1 | 0.0 | 1.1 | 3.9 | 0.4 | 0.0 | - | - | - | 0.1 | - | 0.1 | 0.1 | - |
| 2020 | 0.3 | - | 0.0 | 0.0 | - | 1.2 | 1.1 | - | - | - | - | - | 0.1 | - | 0.1 | - | - |
| 2025 | 0.2 | 0.0 | - | 0.0 | - | 1.0 | 1.9 | 0.0 | - | 0.0 | - | - | 0.1 | - | 0.1 | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gilia inconspicua[a] (shy gilia) | Heliomeris multiflora var. multiflora (showy goldeneye) | Lathyrus brachycalyx (Bonneville pea) | Linum lewisii (Lewis flax) | Lithospermum (stoneseed) | Lomatium dissectum (fernleaf biscuitroot) | Lupinus argenteus (silvery lupine) | Orobanche fasciculata (clustered broomrape) | Pedicularis centranthera (dwarf lousewort) | Penstemon caespitosus (mat penstemon) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 110 | - | - | - | 37 | 9 | 2 | 15 | 17 | 4 | - | 7 | 12 | - | 8 | 47 |
| 2000 | - | 50 | 27 | - | 1 | 6 | - | - | 4 | 22 | 8 | - | 12 | - | - | - | 60 |
| 2005 | - | 82 | - | - | 1 | 15 | - | - | - | 19 | 7 | 1 | 5 | 6 | - | - | 31 |
| 2010 | - | 57 | - | - | 15 | 19 | - | - | - | 18 | 6 | - | 6 | - | - | - | 47 |
| 2015 | - | 35 | 8 | - | 5 | 13 | - | - | 4 | 9 | 4 | 8 | 1 | - | 2 | - | 81 |
| 2020 | 4 | 24 | - | 4 | 2 | 8 | - | - | 1 | 6 | 7 | - | - | 2 | - | - | 73 |
| 2025 | - | 32 | - | 6 | - | 10 | - | - | - | - | 3 | - | 3 | 2 | - | 17 | 58 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.7 | - | - | - | 0.2 | 0.0 | 0.0 | 0.1 | 0.6 | 0.0 | - | 0.0 | 0.1 | - | 0.1 | 0.2 |
| 2000 | - | 0.3 | 0.3 | - | 0.0 | 0.0 | - | - | 0.0 | 0.3 | 0.0 | - | 0.2 | - | - | - | 0.5 |
| 2005 | - | 0.9 | - | - | 0.0 | 0.5 | - | - | - | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.6 |
| 2010 | - | 0.4 | - | - | 0.1 | 0.1 | - | - | - | 0.3 | 0.0 | - | 0.0 | - | - | - | 0.9 |
| 2015 | - | 0.3 | 0.1 | - | 0.1 | 0.2 | - | - | 0.0 | 0.2 | 0.0 | 0.1 | 0.1 | - | 0.0 | - | 2.0 |
| 2020 | 0.0 | 0.2 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.1 | - | - | 1.3 |
| 2025 | - | 0.3 | - | 0.0 | - | 0.2 | - | - | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.3 | 0.9 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon pachyphyllus (thickleaf beardtongue) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) | unknown annual forb[a] (unknown forb) | unknown perennial forb (unknown forb) | Vicia americana (American vetch) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 6 | 43 | 29 | 3 | - | 56 | 39 | 9 | - | 3 | 9 | - |
| 2000 | 2 | 20 | - | 2 | - | 32 | 12 | 1 | - | - | - | - |
| 2005 | - | 62 | 41 | 11 | - | 24 | 21 | - | - | - | 2 | - |
| 2010 | 3 | 20 | 10 | 11 | 7 | 36 | 16 | 5 | - | - | - | - |
| 2015 | 2 | 69 | 16 | - | 1 | 30 | 9 | 9 | 3 | - | - | - |
| 2020 | 6 | 90 | 110 | 13 | - | 11 | - | - | - | - | - | - |
| 2025 | - | 87 | 9 | - | - | 25 | 2 | 5 | - | - | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.0 | 0.2 | 0.1 | 0.0 | - | 0.5 | 0.3 | 0.0 | - | 0.0 | 0.0 | - |
| 2000 | 0.0 | 0.0 | - | 0.0 | - | 0.2 | 0.1 | 0.0 | - | - | - | - |
| 2005 | - | 0.4 | 0.1 | 0.2 | - | 0.4 | 0.2 | - | - | - | 0.2 | - |
| 2010 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.2 | 0.0 | 0.1 | - | - | - | - |
| 2015 | 0.0 | 0.3 | 0.0 | - | 0.0 | 0.2 | 0.1 | 0.1 | 0.0 | - | - | - |
| 2020 | 0.0 | 0.7 | 0.4 | 0.1 | - | 0.1 | - | - | - | - | - | - |
| 2025 | - | 0.5 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-08.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Mahonia repens (creeping barberry) | Opuntia polyacantha (plains pricklypear) | Prunus virginiana[p] (chokecherry) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Rosa woodsii[p] (Woods' rose) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 7.5 | 9.5 | 6.8 | 0.1 | 4.5 | 0.2 | 0 | 1.1 | 0.1 | 0.2 | 0.2 | 4.6 | - | 17.4 | 0.2 |
| 2010 | 4 | 11.4 | 7 | - | 6.8 | 0.1 | 0.2 | 1.2 | 0.1 | 0.1 | 0.5 | 5.2 | - | 17.7 | 0.6 |
| 2015 | 3.2 | 15.8 | 9.9 | - | 8.3 | 0.7 | 0.4 | 6.4 | 0.2 | 0.1 | 0.6 | 11 | 0.1 | 17.1 | 0.6 |
| 2020 | 2 | 15.3 | 9.9 | - | 4.4 | 0.4 | 0.4 | 3 | 0.1 | 0.1 | 0.3 | 9.9 | - | 17.4 | 0.5 |
| 2025 | 2.5 | 17.5 | 7.6 | - | 5.1 | 0.3 | 0.4 | 3.5 | 0.2 | 0.2 | 0.4 | 9 | - | 19.9 | 0.1 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | |
| 1995 | 3.5 | 9.4 | 4.3 | 0.0 | 3.5 | 0.2 | - | 1.1 | - | 0.5 | 0.7 | 2.8 | 0.2 | 13.1 | 0.0 |
| 2000 | 4.2 | 8.5 | 4.5 | - | 2.1 | 0.1 | - | 2.4 | - | 0.3 | 1.0 | 6.0 | 0.0 | 10.3 | 0.1 |
| 2005 | 3.7 | 8.4 | 4.0 | 0.2 | 4.1 | 1.0 | 0.0 | 2.0 | 0.0 | 0.6 | 0.2 | 3.0 | - | 15.3 | 0.0 |
| 2010 | 1.7 | 8.2 | 2.9 | 0.0 | 2.8 | 0.2 | 0.0 | 0.9 | 0.0 | 0.1 | 0.5 | 2.6 | - | 11.2 | 0.0 |
| 2015 | 1.3 | 9.1 | 5.2 | 0.1 | 5.5 | 0.5 | 0.0 | 5.0 | 0.6 | 0.2 | 0.7 | 7.8 | 0.0 | 12.4 | 0.4 |
| 2020 | 2.1 | 13.6 | 6.1 | 0.1 | 3.5 | 0.3 | 0.0 | 3.1 | 0.0 | 0.0 | 0.4 | 6.3 | - | 14.2 | 0.1 |
| 2025 | 1.6 | 12.3 | 5.8 | 0.2 | 4.2 | 0.3 | 0.0 | 3.0 | 0.0 | 0.1 | 0.3 | 6.3 | 0.0 | 11.6 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-08.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 2400 | - | 65 | 33 | 3 | 28 | 3 | 1 | 115/90 |
| 2000 | 2660 | 160 | 26 | 65 | 9 | 13 | 11 | 5 | 134/93 |
| 2005 | 2720 | 40 | 42 | 46 | 12 | 18 | 29 | 2 | 119/75 |
| 2010 | 1440 | 700 | 58 | 39 | 3 | 19 | 21 | 3 | 145/106 |
| 2015 | 700 | 120 | 40 | 40 | 20 | 20 | 37 | 26 | 144/100 |
| 2020 | 1260 | 80 | 49 | 48 | 3 | 18 | 11 | 3 | 73/67 |
| 2025 | 1620 | 20 | 47 | 47 | 6 | 17 | 59 | 6 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1160 | 120 | 22 | 76 | 2 | 19 | 0 | 3 | 73/104 |
| 2000 | 1980 | 240 | 16 | 73 | 11 | 22 | 8 | 1 | 75/93 |
| 2005 | 2040 | 1180 | 7 | 67 | 27 | 16 | 4 | 12 | 58/77 |
| 2010 | 2460 | 600 | 30 | 66 | 4 | 18 | 0 | 8 | 63/89 |
| 2015 | 2940 | 120 | 25 | 71 | 3 | 33 | 31 | 4 | 55/79 |
| 2020 | 3160 | 240 | 17 | 79 | 4 | 30 | 4 | 3 | 69/87 |
| 2025 | 4040 | 40 | 16 | 77 | 6 | 13 | 9 | 6 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 1140 | - | 37 | 63 | 0 | 54 | 7 | 0 | 120/134 |
| 2000 | 1160 | 20 | 45 | 52 | 3 | 40 | 19 | 17 | 112/105 |
| 2005 | 1140 | 20 | 7 | 74 | 19 | 2 | 98 | 4 | 110/90 |
| 2010 | 1200 | 140 | 30 | 65 | 5 | 33 | 25 | 5 | 116/99 |
| 2015 | 1300 | 40 | 28 | 68 | 5 | 5 | 75 | 2 | 98/102 |
| 2020 | 1420 | 40 | 20 | 78 | 3 | 4 | 82 | 4 | 109/95 |
| 2025 | 1280 | 40 | 3 | 95 | 2 | 6 | 94 | 2 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 120 | - | 17 | 83 | 0 | 17 | 0 | 0 | 11/18 |
| 2000 | 160 | - | 38 | 63 | 0 | 0 | 0 | 0 | 36/12 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/27 |
| 2010 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/15 |
| 2015 | 140 | - | 29 | 71 | 0 | 57 | 0 | 0 | 16/23 |
| 2020 | 160 | - | 0 | 100 | 0 | 0 | 100 | 0 | 14/27 |
| 2025 | 60 | - | 0 | 100 | 0 | 67 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 4660 | 40 | 28 | 72 | 0 | 0 | 0 | 0 | 32/35 |
| 2000 | 5000 | 40 | 6 | 92 | 2 | 8 | 0 | 0 | 37/40 |
| 2005 | 3700 | - | 0 | 95 | 5 | 2 | 0 | 2 | 29/37 |
| 2010 | 4380 | 100 | 15 | 85 | 0 | 4 | 0 | 1 | 34/45 |
| 2015 | 4900 | 60 | 10 | 90 | 0 | 0 | 0 | 0 | 53/42 |
| 2020 | 3460 | 40 | 3 | 89 | 8 | 31 | 12 | 6 | 35/41 |
| 2025 | 3740 | - | 12 | 87 | 1 | 23 | 8 | 1 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 300 | - | 33 | 67 | 0 | 0 | 0 | 0 | 15/20 |
| 2000 | 1020 | - | 28 | 73 | 0 | 0 | 0 | 0 | 15/17 |
| 2005 | 880 | - | 7 | 93 | 0 | 0 | 0 | 0 | 14/25 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/17 |
| 2015 | 640 | - | 13 | 88 | 0 | 0 | 0 | 0 | 21/25 |
| 2020 | 1080 | 40 | 4 | 96 | 0 | 0 | 0 | 0 | 18/22 |
| 2025 | 480 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1995 | 3220 | - | 55 | 45 | 0 | 2 | 0 | 0 | 9/14 |
| 2000 | 6280 | - | 6 | 94 | 0 | 0 | 0 | 8 | 9/12 |
| 2005 | 5080 | - | 7 | 93 | 0 | 0 | 0 | 0 | 9/13 |
| 2010 | 9560 | 80 | 46 | 54 | 0 | 0 | 0 | 0 | 8/12 |
| 2015 | 10380 | - | 6 | 94 | 0 | 0 | 0 | 0 | 9/14 |
| 2020 | 10740 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/11 |
| 2025 | 11460 | 20 | 1 | 99 | 1 | 2 | 0 | 4 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/22 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/21 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/29 |
| 2010 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 13/20 |
| 2015 | 140 | - | 43 | 57 | 0 | 0 | 0 | 0 | 14/32 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/26 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Prunus virginiana[p] -- (chokecherry) | | | | | | | | | |
| 1995 | 720 | - | 92 | 8 | 0 | 0 | 0 | 0 | 25/28 |
| 2000 | 760 | 260 | 100 | 0 | 0 | 0 | 0 | 0 | 46/49 |
| 2005 | 420 | - | 71 | 24 | 5 | 5 | 0 | 5 | 28/28 |
| 2010 | 500 | - | 100 | 0 | 0 | 0 | 0 | 0 | 20/20 |
| 2015 | 60 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | 12/10 |
| 2025 | 200 | - | 60 | 40 | 0 | 30 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/60 |
| 2000 | 240 | - | 8 | 92 | 0 | 25 | 8 | 0 | 25/74 |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 83 | 0 | 21/49 |
| 2010 | 160 | - | 0 | 100 | 0 | 0 | 100 | 13 | 21/42 |
| 2015 | 200 | - | 0 | 100 | 0 | 0 | 60 | 0 | 24/48 |
| 2020 | 100 | - | 0 | 80 | 20 | 0 | 100 | 20 | 28/66 |
| 2025 | 120 | - | 17 | 83 | 0 | 0 | 100 | 0 | - / - |

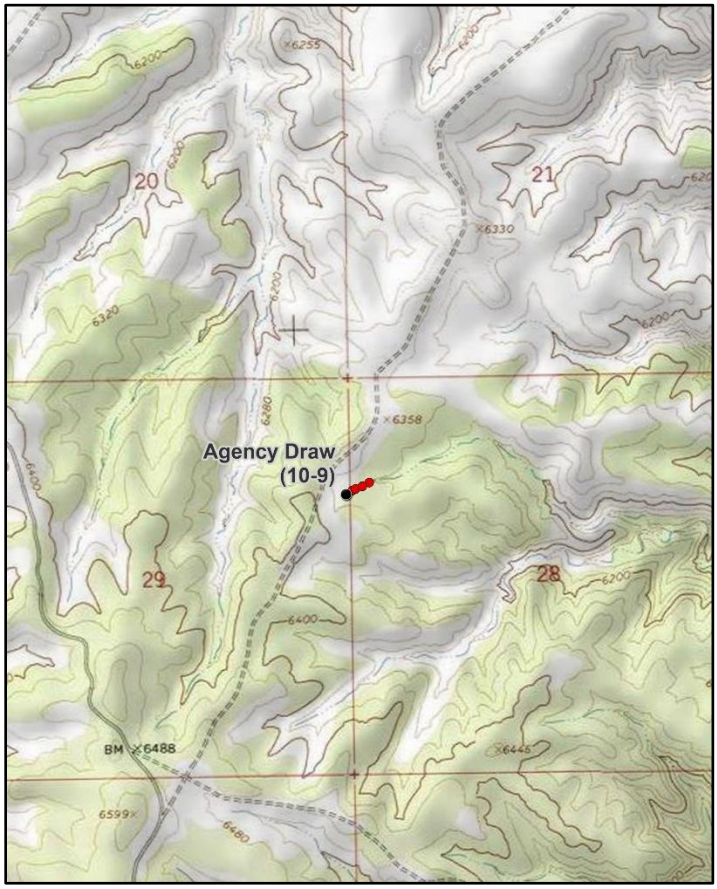
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 1995 | 480 | - | 42 | 58 | 0 | 38 | 4 | 0 | 144/163 |
| 2000 | 4580 | - | 73 | 24 | 4 | 6 | 0 | 1 | 151/112 |
| 2005 | 3020 | 180 | 63 | 27 | 10 | 17 | 1 | 13 | 125/86 |
| 2010 | 3460 | 1300 | 94 | 6 | 0 | 0 | 0 | 0 | 69/61 |
| 2015 | 5780 | 400 | 43 | 57 | 0 | 7 | 2 | 0 | 62/54 |
| 2020 | 2520 | - | 37 | 61 | 2 | 37 | 9 | 2 | 91/84 |
| 2025 | 3720 | - | 51 | 48 | 1 | 20 | 72 | 1 | - / - |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 17/13 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 20/14 |
| 2010 | - | - | - | - | - | - | - | - | 31/19 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/25 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 5480 | 160 | 27 | 73 | 0 | 11 | 1 | 0 | 43/69 |
| 2000 | 5720 | 200 | 5 | 95 | 0 | 15 | 0 | 0 | 38/67 |
| 2005 | 8020 | - | 14 | 85 | 1 | 1 | 0 | 0 | 35/51 |
| 2010 | 6860 | 300 | 19 | 81 | 0 | 3 | 0 | 1 | 37/58 |
| 2015 | 6180 | 20 | 19 | 81 | 0 | 9 | 1 | 1 | 36/56 |
| 2020 | 6600 | 420 | 11 | 89 | 0 | 21 | 6 | 0 | 34/55 |
| 2025 | 7720 | 20 | 11 | 89 | 0 | 25 | 37 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 25 | 0 | 0 | 35/30 |
| 2000 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 38/22 |
| 2005 | 80 | - | 0 | 75 | 25 | 50 | 25 | 0 | 48/34 |
| 2010 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 18/27 |
| 2015 | 140 | - | 14 | 86 | 0 | 43 | 29 | 0 | 38/39 |
| 2020 | 160 | - | 0 | 100 | 0 | 0 | 88 | 0 | 25/35 |
| 2025 | 120 | - | 0 | 100 | 0 | 50 | 50 | 0 | - / - |

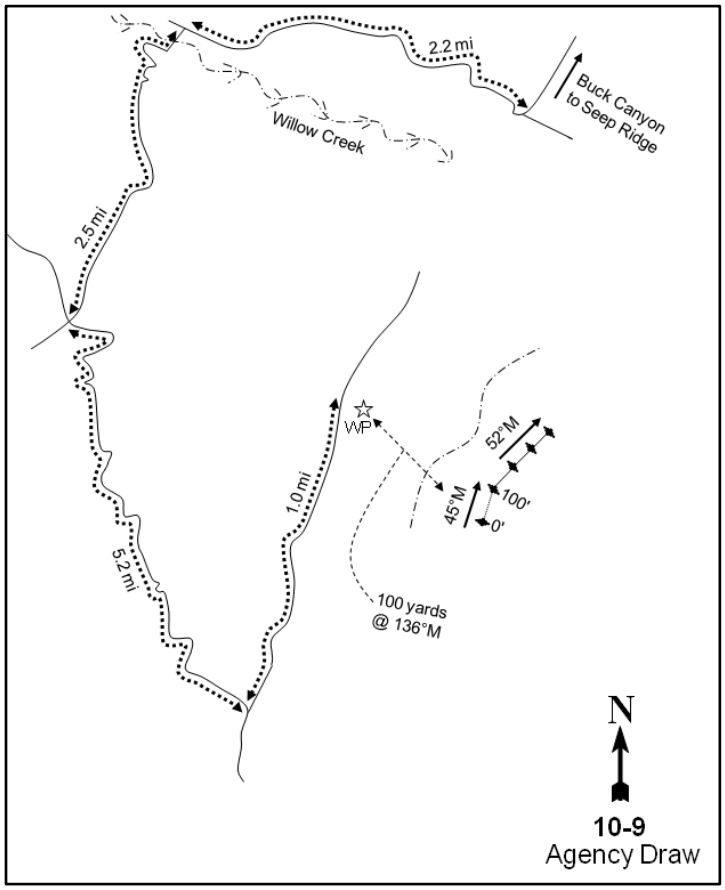
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-08.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 1 | - | - | 100 | - | - | 5.0 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2015 | 2 | - | - | - | - | 100 | 14.0 |
| 2020 | 4 | - | 50 | 50 | - | - | 9.0 |
| 2025 | 4 | - | - | - | 50 | 50 | 13.5 |
| Quercus gambelii (Gambel oak) | | | | | | | |
| 1995 | 21 | - | - | - | - | - | 4.3 |

# AGENCY DRAW - STUDY NO. 10-9




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Agency Draw NE SW; Township 13S, Range 21E, Section 29 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 621674 East 4391037 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 9040 |
| Transect Bearing | 45° magnetic (Line 2-4: 52° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard; Line 2: 50ft Long |

**Directions to Site**

From Seep Ridge Road, go down Buck Canyon to Willow Creek. Travel north on Willow Creek 2.2 miles to a fork. Bear left and cross Willow Creek, then drive up out of the canyon 2.5 miles to another fork. Turn left and continue 5.2 miles to an intersection. Turn left off of the main road and go down 0.1 miles to a small flat. Continue straight (northeast) down the ridge 0.9 miles to a witness post on the right (east) side of the road. From the witness post, walk 100 yards down into the draw at a bearing of 136 degrees magnetic. The 0-foot baseline stake is marked with a red browse tag, #9040. The frequency baseline is marked by green fenceposts that are 12--18 inches in height.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | HORSE POINT |
| Elevation | 6,300ft (1,920m) |
| Aspect | Northeast |
| Slope | 5-8% |
| Sample Dates | 06/27/1995, 06/19/2000, 06/13/2005, 06/24/2010, 06/11/2015, 06/01/2020, 06/10/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-09.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | winter |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | substantial | winter |

**Table 10-09.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 1995 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 2000 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 2005 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 2010 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 2015 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 2020 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |
| 2025 | Wyoming Big Sagebrush/Black Greasewood | Early Phase I |

## Site Notes

The abundance of pellet groups indicates that this area is important winter range for deer. There has been abundant sign of winter use by sage-grouse in the past, with a few birds being observed on an adjacent ridge at the time of study establishment in 1988. A small herd of elk has also been observed in the area. In addition, wild horses frequent the area and were seen in 2000, 2005, and 2010.

## Soils

**Table 10-09.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.7 | 29.0 | 40.4 | 30.6 | 1.4 | 4.0 | 329.6 | 0.9 | 06/19/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1988-1995 - Current Potential State: Community Phase 2.4<br>2000-2010 - Current Potential State: Community Phase 2.2<br>2015 - Current Potential State: Community Phase 2.4<br>2020-2025 - Current Potential State: Community Phase 2.2 |

A mixture of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and black greasewood (*Sarcobatus vermiculatus*) has dominated this site since study establishment in 1988. Other preferred browse species such as black sagebrush (*A. nova*) and winterfat (*Krascheninnikovia lanata*) have also been present, but have contributed less cover than Wyoming big sagebrush (Photos, Pre-1992 Data, Table 10-09.12, Table 10-09.13). The herbaceous understory has remained moderately abundant and diverse over the study period. The introduced annual grass species cheatgrass (*Bromus tectorum*) has contributed much of the herbaceous cover in many sample years, but cover and abundance were low in 2025 (Table 10-09.7, Table 10-09.10, Table 10-09.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have remained rare on the transect, but may have the potential to increase over time; the site has been considered to be within Early Phase I of woodland succession throughout the study period (Table 10-09.4, Table 10--09.6, Table 10-09.12, Table 10-09.14).

This site's condition as mule deer winter range has ranged between fair and good since 1995; winter range condition was considered to be fair-good in 2025. Factors that negatively influence condition as deer winter range include a lack of recruitment of young in the preferred browse community; preferred browse decadence; reduced preferred browse cover; and a lack of perennial grass and forb cover (Table 10-09.6, Table 10-09.7, Table 10-09.13, Table 10-09.15). According to pellet transect data, deer presence has varied between low and moderate and presence was at its highest in 2000. During the 2024/25 winter season the area immediately north of the study site had scattered occurrences of collared mule deer (Wildlife Migration Initiative). Utilization of Wyoming big sagebrush has varied from year to year, but 61% of plants sampled in density strips in 2025 were moderately to heavily browsed. The highest percentages of black sagebrush utilization occurred in 2015 and 2025 (Table 10-09.9, Table 10-09.13). On-site observations in 2025 noted moderate utilization (20-40%) on Indian ricegrass (*Achnatherum hymenoides*) and Sandberg bluegrass (*Poa secunda*), but little to no utilization on forb species.

## Trend Summary Tables

**Table 10-09.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 12.0 | 6.1 | - | - | - | - |
| 2000 | 10.9 | 6.3 | 0.0 | - | - | - |
| 2005 | 10.1 | 4.3 | 0.2 | 7.9 | 4.3 | - |
| 2010 | 10.5 | 5.2 | 0.8 | 8.7 | 7.4 | 0.3 |
| 2015 | 9.4 | 7.1 | 1.0 | 10.2 | 9.4 | 0.4 |
| 2020 | 10.8 | 6.7 | 1.2 | 10.4 | 5.6 | 0.6 |
| 2025 | 10.6 | 6.4 | 2.2 | 12.7 | 6.7 | 1.2 |

**Table 10-09.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 249 | 281 | 109 | 81 | 11.7 | 5.9 | 1.1 | 0.4 |
| 2000 | 109 | 275 | 22 | 84 | 0.8 | 5.8 | 0.2 | 0.5 |
| 2005 | 89 | 293 | 109 | 42 | 1.8 | 8.8 | 2.6 | 0.2 |
| 2010 | 115 | 272 | 231 | 58 | 2.7 | 5.6 | 4.0 | 1.1 |
| 2015 | 321 | 184 | 62 | 158 | 18.1 | 3.7 | 1.6 | 1.8 |
| 2020 | 196 | 219 | 103 | 96 | 3.2 | 5.8 | 1.6 | 0.7 |
| 2025 | 37 | 174 | 116 | 63 | 0.6 | 1.9 | 2.6 | 0.5 |

**Table 10-09.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 26.6 | 2.4 | 33.2 | 8.9 | 3.7 | 36.2 |
| 2000 | 32.1 | 5.0 | 39.0 | 11.0 | 1.8 | 26.1 |
| 2005 | 40.5 | 2.1 | 25.4 | 14.1 | 2.2 | 25.2 |
| 2010 | 31.5 | 1.0 | 33.6 | 9.6 | 2.5 | 32.5 |
| 2015 | 29.6 | 1.9 | 33.9 | 10.1 | 4.9 | 39.9 |
| 2020 | 37.5 | 1.6 | 33.6 | 14.5 | 3.6 | 28.9 |
| 2025 | 41.8 | 0.7 | 32.3 | 17.7 | 2.4 | 23.3 |

**Table 10-09.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 1 | 19 | 1 | 5 | 4 |
| 2000 | - | 29 | 3 | 8 | 10 |
| 2005 | 1 | 45 | 3 | 10 | 28 |
| 2010 | - | 15 | 2 | 4 | 12 |
| 2015 | - | 29 | 5 | 2 | 12 |
| 2020 | - | 32 | 2 | 13 | 11 |
| 2025 | - | 32 | 3 | 9 | - |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | 48.9 (120.8) | 11.4 (28.1) | 22.1 (54.5) | - |
| 2005 | 0.7 (1.8) | 23.4 (57.9) | 12.8 (31.5) | 23.2 (57.4) | - |
| 2010 | - | 26.8 (66.2) | 0.7 (1.7) | 17.4 (43.0) | - |
| 2015 | - | 18.7 (46.3) | 2.0 (5.0) | 10.4 (25.8) | - |
| 2020 | - | 38.2 (94.4) | 0.7 (1.7) | 22.6 (55.9) | - |
| 2025 | - | 39.6 (97.7) | 2.7 (6.6) | 16.8 (41.6) | - |

**Table 10-09.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pascopyrum smithii (western wheatgrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1995 | 56 | 249 | 3 | 61 | 25 | 122 | 139 | - |
| 2000 | 48 | 109 | - | 51 | 24 | 154 | 97 | - |
| 2005 | 49 | 89 | - | 61 | 36 | 110 | 176 | 20 |
| 2010 | 46 | 115 | - | 30 | 28 | 97 | 167 | 31 |
| 2015 | 24 | 321 | 7 | 6 | 39 | 50 | 125 | - |
| 2020 | 24 | 196 | 29 | 6 | 23 | 29 | 168 | - |
| 2025 | 16 | 37 | - | 1 | 9 | 30 | 141 | 0 |
| year | Average Cover (%) | | | | | | | |
| 1995 | 0.8 | 11.7 | 0.0 | 1.1 | 0.3 | 1.8 | 1.8 | - |
| 2000 | 0.4 | 0.8 | - | 0.6 | 0.7 | 3.3 | 0.8 | - |
| 2005 | 0.4 | 1.8 | - | 0.7 | 0.6 | 4.1 | 2.7 | 0.3 |
| 2010 | 0.8 | 2.7 | - | 0.6 | 0.7 | 1.5 | 1.8 | 0.2 |
| 2015 | 0.3 | 18.1 | 0.0 | 0.1 | 0.9 | 0.5 | 2.0 | - |
| 2020 | 0.3 | 3.2 | 1.2 | 0.0 | 0.4 | 0.2 | 3.6 | - |
| 2025 | 0.1 | 0.6 | - | 0.0 | 0.0 | 0.1 | 1.6 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-09.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium (onion) | Antennaria (pussytoes) | Arenaria fendleri (Fendler's sandwort) | Astragalus (milkvetch) | Astragalus lentiginosus (freckled milkvetch) | Astragalus utahensis (Utah milkvetch) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chamaesyce (sandmat) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cordylanthus kingii[a] (King's bird's-beak) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron pumilus (shaggy fleabane) | Halogeton glomeratus[ai] (saltlover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0 | 14 | - | - | - | - | - | - | - | 5 | 5 | - | 48 | 4 | 15 |
| 2000 | - | - | 3 | 1 | - | 1 | - | - | - | - | - | - | - | - | 18 | 4 | - |
| 2005 | 2 | 0 | 5 | - | - | 2 | - | - | - | - | - | 0 | - | 1 | 14 | - | 8 |
| 2010 | 1 | - | 5 | - | - | 2 | - | 4 | - | - | 3 | - | 3 | - | 16 | - | 52 |
| 2015 | 1 | - | 11 | - | 12 | 3 | - | 2 | - | 1 | - | - | 3 | 2 | 15 | 4 | 4 |
| 2020 | - | 9 | 1 | 4 | - | 6 | - | - | 49 | 1 | - | - | 11 | - | 5 | 5 | 35 |
| 2025 | - | - | 11 | - | - | 11 | 4 | - | - | - | 3 | - | 9 | 2 | - | - | 79 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.0 | 0.1 | - | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.7 |
| 2000 | - | - | 0.0 | 0.0 | - | 0.0 | - | - | - | - | - | - | - | - | 0.2 | 0.0 | - |
| 2005 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | 0.0 | - | 0.0 | 0.1 | - | 0.2 |
| 2010 | 0.0 | - | 0.1 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.1 | - | 0.1 | - | 0.8 |
| 2015 | 0.0 | - | 0.1 | - | 0.1 | 0.0 | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.5 | 0.0 | 0.2 |
| 2020 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - | 0.8 | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | 0.3 |
| 2025 | - | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.1 | 0.1 | - | - | 1.7 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Malcolmia africana[ai] (African mustard) | Penstemon (beardtongue) | Petradoria pumila (rock goldenrod) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Stenotus acaulis (stemless mock goldenweed) | Streptanthus cordatus (heartleaf twistflower) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 27 | 28 | 2 | 7 | - | - | 1 | 9 | 43 | - | 5 | - | - | 4 | 2 | 1 | 12 |
| 2000 | 5 | - | - | 4 | - | 4 | - | 7 | 43 | - | - | - | - | 12 | 9 | - | 15 |
| 2005 | 93 | 7 | - | 4 | 4 | - | - | 3 | 8 | - | - | 1 | 3 | 13 | 2 | - | 5 |
| 2010 | 182 | 17 | - | 5 | 34 | - | - | 1 | 15 | - | - | - | 7 | 8 | 4 | 1 | 10 |
| 2015 | 22 | 23 | 34 | 2 | 6 | 1 | 7 | - | 2 | 20 | - | - | 4 | 26 | - | - | 70 |
| 2020 | 44 | 8 | 19 | 5 | 2 | - | - | - | 6 | - | - | - | 8 | 31 | - | - | 3 |
| 2025 | 49 | 27 | - | - | - | - | - | - | 20 | - | - | - | 3 | 5 | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.1 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.1 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.1 |
| 2000 | 0.1 | - | - | 0.0 | - | 0.0 | - | 0.2 | 0.1 | - | - | - | - | 0.1 | 0.1 | - | 0.0 |
| 2005 | 2.3 | 0.1 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 |
| 2010 | 2.6 | 0.4 | - | 0.0 | 0.2 | - | - | 0.1 | 0.1 | - | - | - | 0.1 | 0.1 | 0.3 | 0.0 | 0.0 |
| 2015 | 0.6 | 0.2 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.2 | - | - | 0.0 | 0.1 | - | - | 1.0 |
| 2020 | 0.5 | 0.0 | 0.1 | 0.0 | 0.0 | - | - | - | 0.0 | - | - | - | 0.0 | 0.5 | - | - | 0.0 |
| 2025 | 0.5 | 0.5 | - | - | - | - | - | - | 0.0 | - | - | - | 0.2 | 0.0 | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-09.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Bassia prostrata[pi] (forage kochia) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Opuntia polyacantha (plains pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Sarcobatus vermiculatus (greasewood) | Suaeda moquinii (Mojave seablite) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.1 | 1.1 | 4.3 | 1.5 | 0.1 | - | - | 0.8 | 0 | - | 4.3 | - |
| 2010 | 0.1 | 2.3 | 3.5 | 1.5 | 0.8 | 0.1 | 0.3 | 0.5 | - | - | 7.3 | - |
| 2015 | 0 | 2.2 | 5.5 | 1.4 | 0.6 | 3.2 | 0.2 | 0.5 | - | 0.2 | 6.2 | - |
| 2020 | - | 4.4 | 5.7 | 0.2 | - | - | 0.4 | 0.1 | - | 0.2 | 5.6 | - |
| 2025 | 0.1 | 4 | 8.1 | 0.3 | - | 0.9 | 1.1 | 0.2 | - | 0.1 | 5.6 | 0.2 |
| year | Quadrat Cover (%) | | | | | | | | | | | |
| 1995 | 0.1 | 2.1 | 5.9 | 3.1 | - | 0.0 | - | 0.7 | - | - | 6.0 | - |
| 2000 | 0.2 | 1.4 | 5.6 | 3.5 | - | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 6.2 | - |
| 2005 | 0.0 | 1.0 | 5.1 | 2.5 | 0.6 | 0.0 | 0.1 | 0.9 | 0.0 | 0.0 | 4.3 | - |
| 2010 | 0.0 | 2.4 | 4.5 | 2.3 | 0.2 | 0.4 | 0.8 | 1.1 | - | - | 4.8 | - |
| 2015 | 0.1 | 2.4 | 5.3 | 0.7 | 0.0 | 1.6 | 0.8 | 1.0 | - | 0.1 | 5.5 | - |
| 2020 | 0.0 | 3.3 | 6.5 | 0.3 | - | 0.1 | 0.9 | 0.7 | - | 0.4 | 6.4 | 0.2 |
| 2025 | 0.0 | 3.3 | 5.9 | 0.8 | - | 0.6 | 2.2 | 0.6 | - | 0.0 | 5.5 | 0.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-09.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 1060 | 180 | 11 | 89 | 0 | 0 | 0 | 0 | 31/19 |
| 2000 | 660 | 60 | 24 | 73 | 3 | 9 | 3 | 0 | 13/17 |
| 2005 | 360 | - | 11 | 89 | 0 | 6 | 0 | 0 | 17/14 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/14 |
| 2015 | 300 | - | 47 | 53 | 0 | 0 | 0 | 0 | 26/23 |
| 2020 | 40 | 20 | 50 | 0 | 50 | 0 | 50 | 50 | 24/24 |
| 2025 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 1280 | 200 | 14 | 77 | 9 | 64 | 6 | 6 | 33/49 |
| 2000 | 1120 | 20 | 16 | 52 | 32 | 38 | 2 | 11 | 29/48 |
| 2005 | 980 | 100 | 0 | 55 | 45 | 27 | 27 | 10 | 25/40 |
| 2010 | 1380 | 420 | 23 | 49 | 28 | 9 | 19 | 13 | 35/52 |
| 2015 | 1560 | - | 17 | 82 | 1 | 0 | 86 | 4 | 28/56 |
| 2020 | 3280 | 40 | 51 | 45 | 4 | 34 | 10 | 6 | 30/53 |
| 2025 | 2120 | 240 | 11 | 70 | 19 | 25 | 67 | 19 | - / - |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 2620 | 980 | 44 | 47 | 10 | 34 | 2 | 2 | 58/78 |
| 2000 | 2760 | 180 | 35 | 40 | 25 | 41 | 17 | 12 | 60/77 |
| 2005 | 1600 | 140 | 13 | 35 | 53 | 34 | 53 | 38 | 51/72 |
| 2010 | 2040 | 120 | 49 | 31 | 20 | 24 | 14 | 23 | 56/76 |
| 2015 | 2220 | 20 | 43 | 38 | 19 | 37 | 42 | 30 | 43/62 |
| 2020 | 2320 | 40 | 54 | 35 | 10 | 18 | 10 | 10 | 55/78 |
| 2025 | 3300 | 60 | 44 | 46 | 10 | 27 | 34 | 12 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | 1840 | 40 | 10 | 65 | 25 | 11 | 0 | 11 | 37/54 |
| 2000 | 1600 | - | 8 | 60 | 33 | 9 | 10 | 13 | 40/53 |
| 2005 | 1180 | 380 | 19 | 59 | 22 | 9 | 2 | 10 | 40/58 |
| 2010 | 1500 | 20 | 25 | 71 | 4 | 0 | 0 | 1 | 39/50 |
| 2015 | 980 | - | 18 | 74 | 8 | 16 | 8 | 16 | 32/43 |
| 2020 | 760 | 640 | 37 | 50 | 13 | 8 | 0 | 18 | 27/34 |
| 2025 | 1240 | 20 | 37 | 56 | 7 | 5 | 0 | 3 | - / - |
| Bassia prostrata[Pi] -- (forage kochia) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 700 | - | 0 | 100 | 0 | 0 | 63 | 0 | 31/34 |
| 2010 | 780 | - | 28 | 72 | 0 | 0 | 0 | 0 | 45/49 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/41 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 41/50 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 340 | 240 | 53 | 47 | 0 | 0 | 0 | 0 | 21/20 |
| 2000 | 560 | - | 14 | 57 | 29 | 0 | 0 | 25 | 13/20 |
| 2005 | 180 | 20 | 22 | 78 | 0 | 0 | 0 | 0 | 21/24 |
| 2010 | 1320 | - | 39 | 61 | 0 | 0 | 0 | 11 | 21/17 |
| 2015 | 7360 | 100 | 37 | 63 | 0 | 0 | 0 | 2 | 23/21 |
| 2020 | 1520 | 320 | 79 | 17 | 4 | 0 | 0 | 4 | 10/10 |
| 2025 | 2020 | - | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 50 | 0 | 50 | 0 | 0 | 0 | - / - |
| 2010 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | - | 100 | 0 | 0 | 50 | 0 | 50 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 1780 | 100 | 19 | 80 | 1 | 5 | 0 | 0 | 26/24 |
| 2000 | 1740 | - | 30 | 64 | 6 | 13 | 17 | 3 | 24/23 |
| 2005 | 2040 | 80 | 12 | 86 | 2 | 7 | 79 | 2 | 22/25 |
| 2010 | 2500 | 20 | 19 | 81 | 0 | 8 | 4 | 2 | 30/24 |
| 2015 | 1820 | - | 13 | 82 | 4 | 26 | 59 | 7 | 15/22 |
| 2020 | 1420 | 20 | 65 | 34 | 1 | 6 | 3 | 3 | 13/14 |
| 2025 | 1160 | - | 21 | 79 | 0 | 48 | 24 | 0 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 40 | - | 0 | 50 | 50 | 0 | 0 | 0 | 12/36 |
| 2000 | 40 | 20 | 0 | 50 | 50 | 0 | 0 | 50 | 4/22 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/41 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/30 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 50 | 9/26 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/27 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/12 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 100 | 0 | 0 | 0 | 50 | 0 | - / - |
| 2010 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | 40 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1995 | 680 | - | 18 | 77 | 6 | 0 | 0 | 0 | 90/129 |
| 2000 | 1680 | - | 64 | 33 | 2 | 0 | 0 | 1 | 91/132 |
| 2005 | 660 | 40 | 3 | 85 | 12 | 15 | 3 | 3 | 73/104 |
| 2010 | 660 | - | 12 | 85 | 3 | 0 | 0 | 0 | 80/129 |
| 2015 | 1220 | - | 46 | 51 | 3 | 3 | 3 | 3 | 69/106 |
| 2020 | 780 | - | 13 | 69 | 18 | 13 | 3 | 10 | 74/112 |
| 2025 | 820 | - | 5 | 81 | 15 | 0 | 61 | 15 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 7/8 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 7/7 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Suaeda moquinii -- (Mojave seablite) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 760 | 260 | 11 | 90 | 0 | 0 | 0 | 0 | 17/21 |
| 2025 | 460 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia spinosa -- (shortspine horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 59/78 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

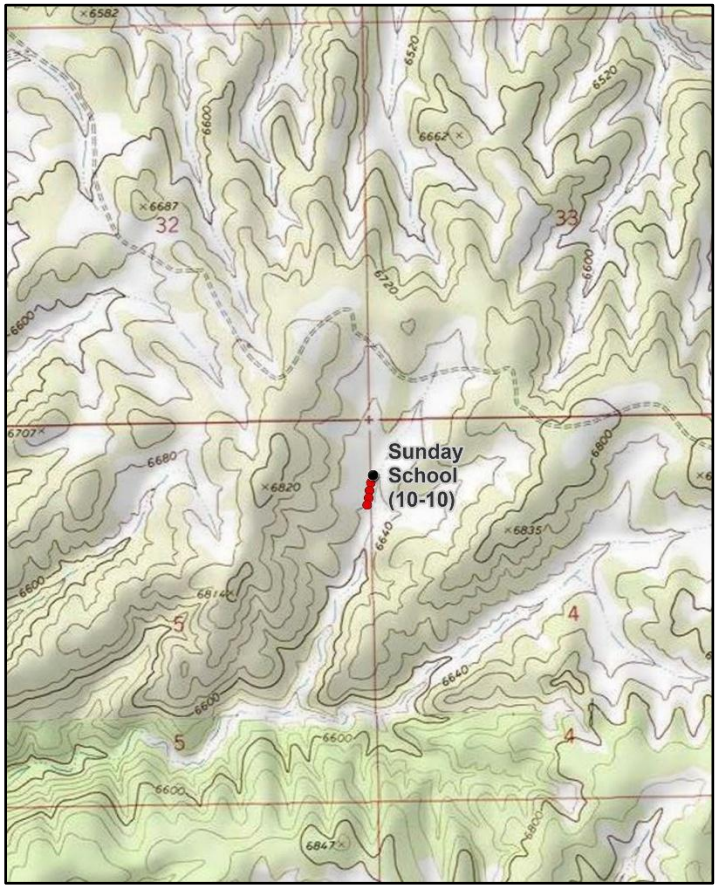
**Table 10-09.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

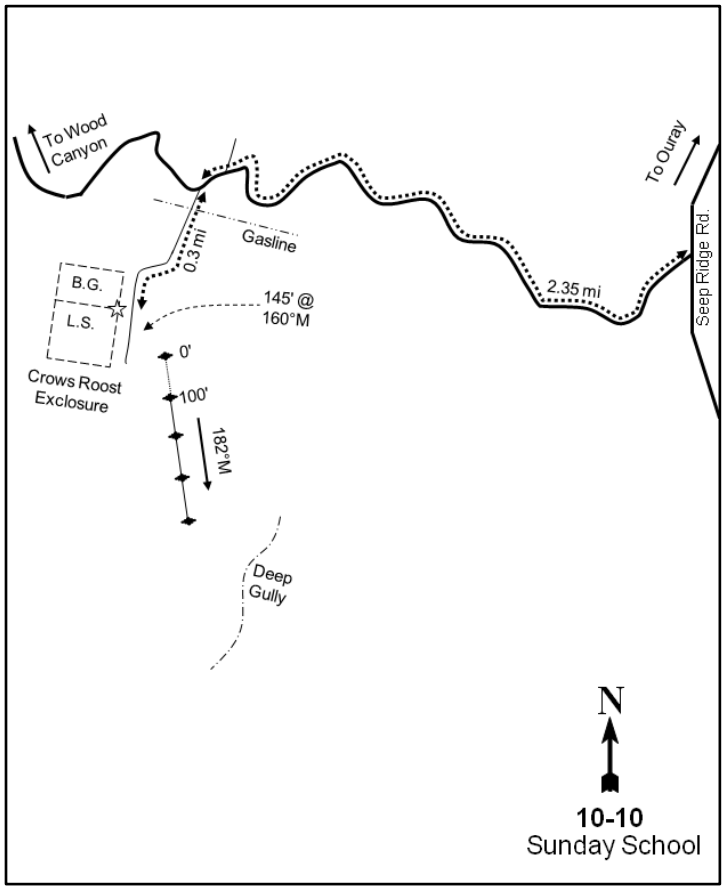
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 34 | - | 82 | 9 | 9 | - | 11.2 |
| 2020 | 40 | 8 | 42 | 33 | 8 | 8 | 14.8 |
| 2025 | 26 | - | 67 | 22 | 11 | - | 4.6 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 13 | 17 | 50 | 33 | - | - | 7.3 |
| 2020 | 17 | 20 | 40 | 20 | 20 | - | 7.6 |
| 2025 | 11 | 17 | 33 | 17 | 33 | - | 10.5 |

**Table 10-09.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 14.2 | 11.1 | 13.9 | 11.9 | -8.8 | 0.8 | 0.0 | **43.1** | Fair-Good |
| 2000 | 12.7 | 6.7 | 11.7 | 11.6 | -0.6 | 1.0 | 0.0 | **43.1** | Fair-Good |
| 2005 | 9.5 | 3.3 | 5.8 | 17.6 | -1.3 | 0.5 | 0.0 | **35.4** | Fair |
| 2010 | 10.7 | 10.4 | 15.0 | 11.2 | -2.0 | 2.3 | 0.0 | **47.6** | Good |
| 2015 | 12.6 | 11.5 | 15.0 | 7.4 | -13.6 | 3.6 | 0.0 | **36.5** | Fair |
| 2020 | 13.0 | 12.6 | 15.0 | 11.6 | -2.4 | 1.5 | 0.0 | **51.3** | Good |
| 2025 | 15.8 | 11.2 | 15.0 | 3.7 | -0.5 | 1.0 | 0.0 | **46.2** | Fair-Good |

# SUNDAY SCHOOL - STUDY NO. 10-10




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Bates Knolls SW; Township 14S, Range 22E, Section 04 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 631373 East 4388223 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 182° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Seep Ridge Road, turn onto Wood Canyon/Willow Creek Road and proceed west for 2.35 miles. Turn left onto a jeep trail and go 0.3 miles to the Crows Roost Exclosure; the study site is on the east side of the exclosure. The 0-foot baseline stake is 29 paces from the southeast corner of the big game exclosure at a bearing of 160 degrees magnetic. The frequency baseline runs south from there, parallel to the livestock exclosure fence. The study is marked by 2-foot tall green metal fenceposts.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SUNDAY SCHOOL CANYON |
| Elevation | 6,650ft (2,027m) |
| Aspect | South-Southeast |
| Slope | 1-5% |
| Sample Dates | 06/21/1995, 06/06/2000, 06/06/2005, 06/07/2010, 06/01/2015, 06/02/2020, 06/10/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-10.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | winter |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10-10.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Fourwing Saltbush/Wyoming Big Sagebrush | No Encroachment |
| 1995 | Annual Forb/Wyoming Big Sagebrush | No Encroachment |
| 2000 | Fourwing Saltbush/Wyoming Big Sagebrush | No Encroachment |
| 2005 | Wyoming Big Sagebrush | No Encroachment |
| 2010 | Prairie Sagewort | No Encroachment |
| 2015 | Prairie Sagewort | No Encroachment |
| 2020 | Wyoming Big Sagebrush/Perennial Grass | No Encroachment |
| 2025 | Wyoming Big Sagebrush | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 10-10.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.7 | 28.0 | 39.4 | 32.6 | 2.4 | 10.1 | 409.6 | 0.6 | 06/06/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Upland Silt Loam (Fourwing Saltbush-Winterfat) |
| NRCS Ecological Site # | R034BY329UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1988, the plant community on this site was a mixed stand of fourwing saltbush (*Atriplex canescens*) and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with other beneficial shrub species present that provided limited cover (Pre-1992 Data). In 2010, the plant community transitioned to one dominated by prairie sagewort (*Artemisia frigida*), with either prairie sagewort or Wyoming big sagebrush being the dominant shrub in subsequent sample years (Table 10-10.12, Table 10-10.13, Photos). Diversity in the herbaceous understory has remained limited over the duration of the study. Annual forbs, particularly the annual species western tansymustard (*Descurainia pinnata*), contributed a majority of the herbaceous cover and were a co-dominant vegetation component in 1995. In 2020, perennial grasses co-dominated with Wyoming big sagebrush, but cover decreased in 2025. The introduced annual grass species cheatgrass (*Bromus tectorum*) was present through the 2020 sample year with fluctuating cover, but cheatgrass was not observed in 2025 (Table 10-10.7, Table 10-10.10, Table 10-10.11).

This site's condition as mule deer winter range has ranged between very poor-poor and excellent since 1995; winter range condition was considered to be fair-good in 2025. Factors that negatively influence condition as deer winter range include a lack of perennial grass and forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 10-10.10, Table 10-10.11, Table 10-10.15). According to pellet transect data, deer and elk presence has been low over the course of the study. The highest percentages of Wyoming big sagebrush and fourwing saltbush utilization occurred in 2005 and 2020 (Table 10-10.9, Table 10-10.13). On-site observations in 2025 noted moderate utilization (20-40%) on blue grama (*Bouteloua gracilis*) and western wheatgrass (*Pascopyrum smithii*), and little to no utilization on forb species.

## Trend Summary Tables

**Table 10-10.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 12.4 | - | - | - | - | - |
| 2000 | 19.6 | - | - | - | - | - |
| 2005 | 16.0 | - | - | 12.9 | - | - |
| 2010 | 21.6 | - | - | 22.2 | - | - |
| 2015 | 30.8 | 0.2 | - | 40.7 | 0.1 | - |
| 2020 | 15.3 | - | - | 16.5 | - | - |
| 2025 | 22.3 | 0.1 | - | 22.1 | - | - |

**Table 10-10.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 301 | 159 | 379 | 120 | 10.7 | 1.8 | 20.1 | 1.3 |
| 2000 | 89 | 332 | 75 | 171 | 0.5 | 12.5 | 0.3 | 3.2 |
| 2005 | 43 | 343 | 290 | 125 | 0.2 | 9.5 | 7.9 | 1.8 |
| 2010 | 89 | 334 | 296 | 109 | 0.7 | 13.3 | 4.2 | 1.0 |
| 2015 | 269 | 354 | 9 | 93 | 4.6 | 15.9 | 0.0 | 0.6 |
| 2020 | 248 | 299 | 183 | 73 | 8.8 | 14.0 | 1.4 | 0.6 |
| 2025 | - | 290 | 168 | 99 | - | 7.8 | 4.7 | 1.1 |

**Table 10-10.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 21.2 | 0.0 | 40.1 | 2.6 | 0.3 | 49.3 |
| 2000 | 35.5 | 0.4 | 41.9 | 3.0 | 0.1 | 36.5 |
| 2005 | 49.5 | 0.1 | 22.7 | 7.9 | 0.6 | 29.1 |
| 2010 | 36.5 | 0.0 | 39.9 | 5.7 | 0.1 | 38.4 |
| 2015 | 23.3 | 0.3 | 34.4 | 6.9 | 0.2 | 53.4 |
| 2020 | 23.3 | 1.1 | 56.0 | 5.1 | 0.1 | 40.0 |
| 2025 | 40.3 | 0.0 | 30.4 | 11.4 | 0.4 | 33.2 |

**Table 10-10.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 3 | - | - | - | 3 |
| 2000 | 6 | 6 | 11 | - | 38 |
| 2005 | 10 | 10 | 22 | - | 86 |
| 2010 | - | 8 | 3 | 6 | 16 |
| 2015 | 1 | 4 | 16 | - | 27 |
| 2020 | 3 | 20 | 12 | 8 | 31 |
| 2025 | - | 14 | 4 | 23 | 15 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 18.9 (46.6) | 3.4 (8.3) | 20.1 (49.7) | - | - |
| 2005 | 13.1 (32.3) | 10.0 (24.8) | 16.1 (39.7) | - | - |
| 2010 | - | 9.4 (23.2) | 6.7 (16.6) | 6.4 (15.8) | - |
| 2015 | 0.7 (1.8) | 2.7 (6.6) | 24.8 (61.2) | 2.3 (5.7) | - |
| 2020 | 0.7 (1.8) | 3.4 (8.3) | 8.7 (21.5) | 11.1 (27.3) | - |
| 2025 | 0.7 (1.8) | 1.3 (3.3) | 4.0 (9.9) | 16.8 (41.6) | - |

**Table 10-10.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Pascopyrum smithii (western wheatgrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | - | 22 | 301 | - | 133 | 17 | 10 |
| 2000 | - | 104 | 89 | - | 298 | 32 | - |
| 2005 | 1 | 143 | 43 | 3 | 293 | 27 | 2 |
| 2010 | - | 145 | 89 | - | 261 | 26 | 6 |
| 2015 | - | 217 | 269 | - | 278 | 23 | - |
| 2020 | - | 69 | 248 | 11 | 261 | 39 | - |
| 2025 | - | 80 | - | - | 249 | 20 | - |
| year | Average Cover (%) | | | | | | |
| 1995 | - | 0.2 | 10.7 | - | 1.4 | 0.1 | 0.1 |
| 2000 | - | 1.7 | 0.5 | - | 10.6 | 0.2 | - |
| 2005 | 0.0 | 3.8 | 0.2 | 0.0 | 5.1 | 0.6 | 0.0 |
| 2010 | - | 5.1 | 0.7 | - | 7.6 | 0.4 | 0.2 |
| 2015 | - | 8.7 | 4.6 | - | 6.7 | 0.5 | - |
| 2020 | - | 1.8 | 8.8 | 0.4 | 11.2 | 0.6 | - |
| 2025 | - | 3.4 | - | - | 3.7 | 0.7 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-10.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chorispora tenella[ai] (crossflower) | Delphinium (larkspur) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) | Halogeton glomeratus[ai] (saltlover) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Orobanche (broomrape) | Phlox longifolia (longleaf phlox) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1995 | - | 95 | - | - | 1 | 362 | 22 | - | 95 | - | - | 30 | - | - | 89 |
| 2000 | - | 26 | - | - | - | - | - | - | 49 | - | - | 16 | - | - | 162 |
| 2005 | - | 25 | 6 | - | - | 6 | - | - | 283 | - | - | 17 | - | 0 | 117 |
| 2010 | - | 208 | 10 | - | - | 16 | 5 | - | 239 | 0 | - | 51 | - | 2 | 71 |
| 2015 | - | - | - | - | - | 3 | - | - | 9 | - | 4 | 20 | - | - | 83 |
| 2020 | 69 | 73 | 1 | 4 | - | 30 | - | 2 | 111 | - | - | 36 | - | - | 50 |
| 2025 | 155 | 1 | - | - | - | - | - | - | 22 | - | - | 42 | 1 | - | 69 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1995 | - | 0.7 | - | - | 0.0 | 19.0 | 0.5 | - | 0.4 | - | - | 0.1 | - | - | 0.6 |
| 2000 | - | 0.1 | - | - | - | - | - | - | 0.2 | - | - | 0.1 | - | - | 3.1 |
| 2005 | - | 0.1 | 0.0 | - | - | 0.0 | - | - | 7.8 | - | - | 0.0 | - | 0.0 | 1.8 |
| 2010 | - | 2.5 | 0.0 | - | - | 0.1 | 0.0 | - | 1.6 | 0.0 | - | 0.4 | - | 0.0 | 0.6 |
| 2015 | - | - | - | - | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.1 | - | - | 0.5 |
| 2020 | 0.4 | 0.2 | 0.0 | 0.0 | - | 0.1 | - | 0.0 | 0.7 | - | - | 0.2 | - | - | 0.4 |
| 2025 | 4.6 | 0.0 | - | - | - | - | - | - | 0.1 | - | - | 0.2 | 0.0 | - | 0.9 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-10.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Cercocarpus ledifolius[p] (curl-leaf mountain mahogany) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2005 | 1.7 | 6.1 | 1.9 | - | - | 3.2 |
| 2010 | 8.3 | 8.6 | 2.2 | - | - | 3.1 |
| 2015 | 20 | 15.5 | 1.8 | - | 0.1 | 3.4 |
| 2020 | 0.1 | 11.5 | 2.2 | - | - | 2.7 |
| 2025 | 3.1 | 10.6 | 4.6 | - | - | 3.8 |
| year | Quadrat Cover (%) | | | | | |
| 1995 | 1.8 | 4.5 | 2.8 | - | - | 3.2 |
| 2000 | 3.6 | 8.0 | 5.2 | - | - | 2.8 |
| 2005 | 3.0 | 7.3 | 2.5 | - | - | 3.3 |
| 2010 | 8.2 | 8.8 | 1.1 | - | - | 3.5 |
| 2015 | 17.6 | 10.5 | 1.1 | 0.0 | 0.2 | 1.6 |
| 2020 | 0.4 | 11.3 | 1.7 | - | - | 1.9 |
| 2025 | 4.5 | 11.0 | 2.9 | 0.0 | 0.1 | 3.9 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-10.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 2040 | 8880 | 33 | 66 | 1 | 0 | 0 | 1 | 19/13 |
| 2000 | 9660 | 340 | 14 | 86 | 0 | 0 | 0 | 0 | 13/19 |
| 2005 | 7860 | 160 | 13 | 87 | 0 | 32 | 7 | 0 | 14/18 |
| 2010 | 18960 | 2480 | 37 | 63 | 0 | 7 | 1 | 1 | 14/24 |
| 2015 | 39860 | 4880 | 36 | 64 | 0 | 13 | 0 | 0 | 16/22 |
| 2020 | 360 | 240 | 28 | 72 | 0 | 0 | 0 | 0 | 9/11 |
| 2025 | 8680 | 540 | 16 | 83 | 1 | 13 | 0 | 1 | - / - |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 2700 | 420 | 43 | 55 | 2 | 11 | 4 | 1 | 52/66 |
| 2000 | 1780 | 60 | 9 | 88 | 3 | 6 | 0 | 16 | 61/78 |
| 2005 | 1720 | - | 6 | 51 | 43 | 36 | 28 | 27 | 59/79 |
| 2010 | 6980 | 860 | 75 | 23 | 3 | 13 | 3 | 6 | 65/80 |
| 2015 | 4340 | 180 | 45 | 49 | 6 | 18 | 29 | 6 | 62/88 |
| 2020 | 3080 | - | 14 | 66 | 20 | 55 | 8 | 21 | 58/76 |
| 2025 | 2940 | 20 | 20 | 52 | 28 | 39 | 20 | 37 | - / - |

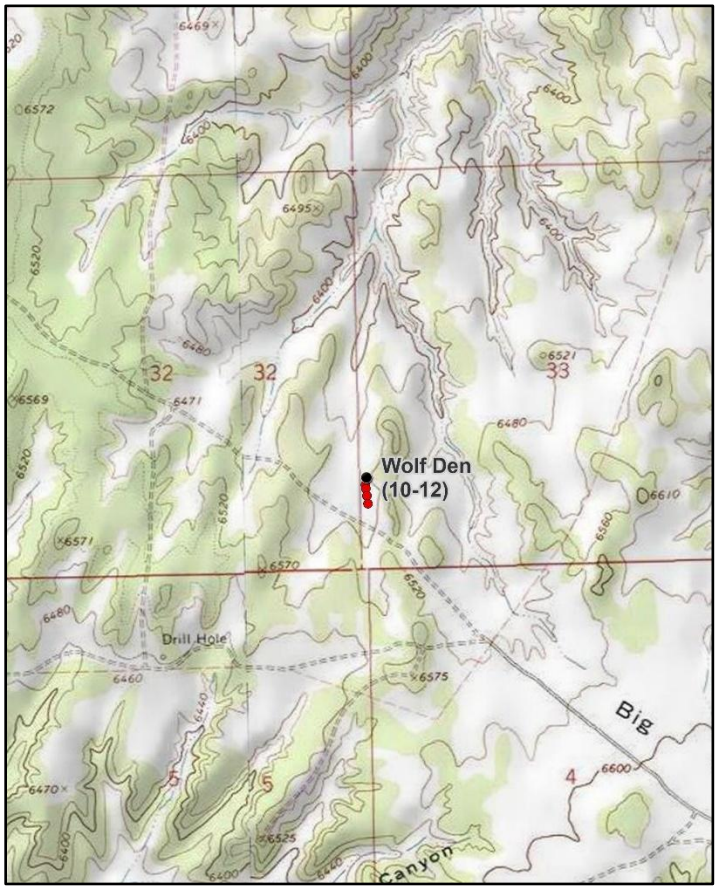
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 1860 | - | 3 | 17 | 80 | 5 | 8 | 47 | 46/65 |
| 2000 | 2200 | - | 6 | 66 | 27 | 43 | 6 | 0 | 46/60 |
| 2005 | 1740 | - | 7 | 61 | 32 | 20 | 60 | 18 | 26/38 |
| 2010 | 1260 | 20 | 22 | 43 | 35 | 37 | 21 | 19 | 32/51 |
| 2015 | 880 | 120 | 9 | 50 | 41 | 9 | 46 | 71 | 46/57 |
| 2020 | 1300 | - | 19 | 54 | 28 | 14 | 60 | 22 | 43/48 |
| 2025 | 1280 | 40 | 22 | 64 | 14 | 23 | 30 | 13 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 15/20 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/16 |
| 2015 | 820 | 40 | 93 | 7 | 0 | 0 | 0 | 0 | 19/23 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 8320 | 40 | 7 | 86 | 7 | 3 | 4 | 0 | 24/23 |
| 2000 | 7380 | 120 | 6 | 94 | 1 | 18 | 1 | 0 | 18/20 |
| 2005 | 10280 | 20 | 9 | 90 | 1 | 13 | 79 | 1 | 17/18 |
| 2010 | 9440 | 140 | 9 | 91 | 0 | 20 | 17 | 2 | 18/23 |
| 2015 | 7020 | 240 | 33 | 65 | 1 | 57 | 7 | 0 | 16/19 |
| 2020 | 7560 | 20 | 29 | 71 | 0 | 10 | 16 | 0 | 15/16 |
| 2025 | 14440 | 120 | 24 | 76 | 0 | 27 | 20 | 2 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 3/7 |

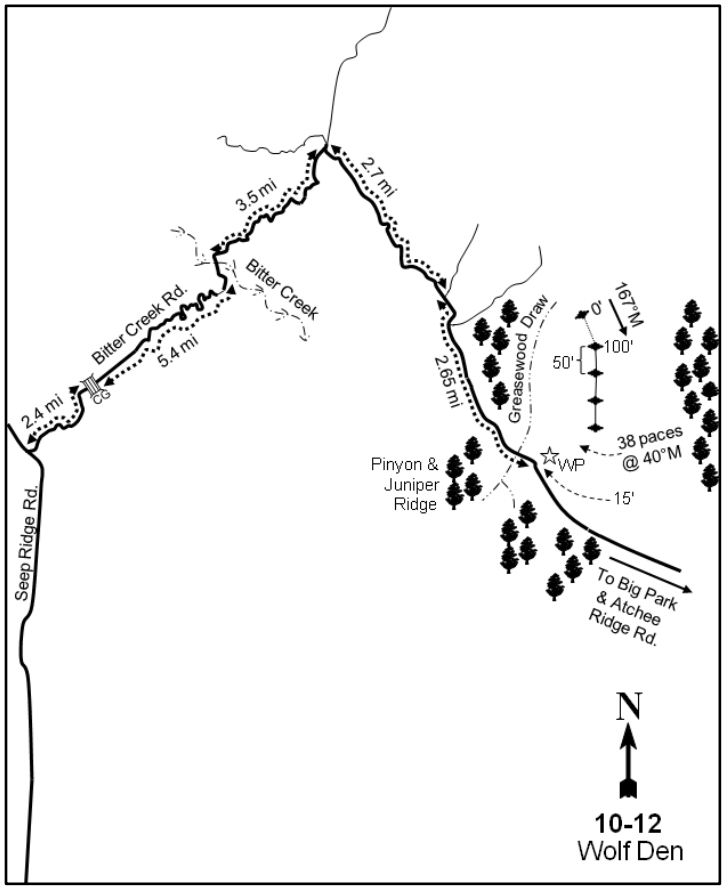
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-10.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 15.0 | 8.7 | 11.5 | 3.6 | -8.0 | 2.6 | 0.0 | **33.4** | Very Poor-Poor |
| 2000 | 23.6 | 12.4 | 4.4 | 25.0 | -0.4 | 6.4 | 0.0 | **71.4** | Good |
| 2005 | 15.7 | 7.5 | 3.8 | 19.1 | -0.2 | 3.6 | 0.0 | **49.5** | Poor-Fair |
| 2010 | 25.7 | 13.6 | 15.0 | 26.5 | -0.6 | 2.0 | 0.0 | **82.2** | Excellent |
| 2015 | 30.0 | 13.7 | 15.0 | 30.0 | -3.5 | 1.1 | 0.0 | **86.3** | Excellent |
| 2020 | 20.6 | 9.8 | 8.5 | 28.0 | -6.6 | 1.1 | 0.0 | **61.4** | Fair |
| 2025 | 26.9 | 10.1 | 10.4 | 15.6 | 0.0 | 2.3 | 0.0 | **65.3** | Fair-Good |

# WOLF DEN - STUDY NO. 10-12




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Burnt Timber Canyon ; Township 12S, Range 24E, Section 33 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 650422 East 4398983 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 9098 |
| Transect Bearing | 173° magnetic (Line 2-4: 163° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard; Line 2: 50ft Long |

**Directions to Site**

From Seep Ridge Road (about 10 miles north of Pine Spring) turn onto Bitter Creek Road near McCoy Reservoir. Drive easterly on this road for 2.4 miles to a cattle guard. Continue 5.4 miles to a corral in the bottom of Bitter Creek. Drive up out of the Bitter Creek canyon for 3.5 miles. Where the road levels out, turn right off of the main road. Go 2.7 miles to a minor fork. Continue straight on the main road for 2.65 miles to the east edge of a sagebrush/greasewood draw; there is a witness post 15 feet off of the north side of the road. From the witness post walk 38 paces at a bearing of 40 degrees magnetic to the 400-foot baseline stake. The 0-foot baseline stake, marked by browse tag #9098, is 400 feet north.

Alternate Route: From the intersection of Atchee Ridge Road and Big Park Road travel north toward Big Park for 3.45 miles to a fork. Stay left and continue 0.15 miles to another fork. Go straight to Big Park for 5.7 miles to a cattle guard and a fork. Proceed right for 0.4 miles to the witness post.

| Site Information | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | ASPHALT DRAW |
| Elevation | 6,500ft (1,981m) |
| Aspect | North |
| Slope | 3-5% |
| Sample Dates | 06/22/1995, 06/14/2000, 06/08/2005, 06/09/2010, 06/02/2015, 06/03/2020, 06/10/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-12.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10-12.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-12.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.9 | 46.0 | 33.4 | 20.6 | 1.8 | 3.5 | 115.2 | 0.6 | 06/14/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Upland Loam (Bonneville Big Sagebrush) |
| NRCS Ecological Site # | R048AY308UT |
| States and Transitions | 1988-2025 - Current Potential State: Community Phase 2.2 |

Since study establishment in 1988, this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant vegetation component (Photos, Pre-1992 Data). Prairie sagewort (*Artemisia frigida*) exhibited a significant increase in cover in 2015, but has since decreased (Table 10-12.12). The herbaceous understory has been depauperate in both diversity and abundance throughout the study period. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed in some sample years, but with low abundance (Table 10-12.7, Table 10-12.10, Table 10-12.11). This site will likely continue to remain in this or a similar state in the future if a shrub-removing disturbance does not occur.

This site's condition as mule deer winter range has ranged between very poor and fair since 1995; winter range condition was considered to be poor in 2025. Factors that negatively influence condition as deer winter range include a lack of perennial grass and forb cover (Table 10-12.10, Table 10-12.11, Table 10-12.15). According to pellet transect data deer presence, although variable, has gradually decreased over the course of the study. During the 2024/25 winter season the study site had scattered, but common, occurrences of collared mule deer (Wildlife Migration Initiative). The highest percentages of Wyoming big sagebrush and fourwing saltbush utilization occurred in 1995, 2005, and 2025 (Table 10-12.9, Table 10-12.13). On-site observations in 2025 noted that there was little to no utilization of the herbaceous community.

## Trend Summary Tables

**Table 10-12.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 35.6 | 2.4 | 0.1 | - | - | - |
| 2000 | 36.3 | 5.4 | 0.2 | - | - | - |
| 2005 | 27.0 | 3.6 | 0.4 | 33.0 | 3.4 | 0.8 |
| 2010 | 25.4 | 3.3 | - | 26.8 | 3.9 | - |
| 2015 | 40.7 | 4.4 | 0.0 | 42.3 | 5.3 | 0.5 |
| 2020 | 24.8 | 4.4 | - | 25.6 | 5.3 | 0.5 |
| 2025 | 26.8 | 5.8 | 0.0 | 28.8 | 5.7 | 0.4 |

**Table 10-12.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 3 | 97 | 211 | 2 | 0.0 | 0.4 | 1.9 | 0.0 |
| 2000 | - | 139 | 3 | - | - | 2.1 | 0.0 | - |
| 2005 | - | 66 | 126 | 8 | - | 0.2 | 1.4 | 0.1 |
| 2010 | - | 21 | 10 | 22 | - | 0.1 | 0.0 | 0.3 |
| 2015 | 5 | 28 | 118 | 29 | 0.0 | 0.1 | 0.8 | 0.1 |
| 2020 | 4 | 24 | 28 | 1 | 0.0 | 0.6 | 0.3 | 0.0 |
| 2025 | - | 29 | 8 | - | - | 0.4 | 0.0 | - |

**Table 10-12.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 8.5 | 6.8 | 42.8 | 19.6 | 0.7 | 43.5 |
| 2000 | 19.0 | 9.2 | 45.0 | 15.1 | 0.0 | 41.5 |
| 2005 | 16.0 | 9.0 | 39.7 | 18.5 | 0.0 | 31.7 |
| 2010 | 33.2 | 3.5 | 42.9 | 9.2 | 0.0 | 28.2 |
| 2015 | 22.2 | 5.6 | 41.1 | 12.4 | 0.2 | 43.2 |
| 2020 | 23.8 | 6.5 | 59.5 | 9.3 | 0.1 | 30.6 |
| 2025 | 15.3 | 2.9 | 51.7 | 27.0 | 0.0 | 32.7 |

**Table 10-12.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 52 | 3 | - | 7 |
| 2000 | 47 | 4 | - | 6 |
| 2005 | 77 | 8 | - | 70 |
| 2010 | 39 | 1 | - | 5 |
| 2015 | 50 | 2 | - | 14 |
| 2020 | 50 | 2 | - | 13 |
| 2025 | 50 | - | - | 5 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 116.6 (288.0) | 3.4 (8.3) | - | - |
| 2005 | 241.3 (595.9) | - | - | - |
| 2010 | 212.4 (524.7) | 2.0 (5.0) | - | - |
| 2015 | 41.5 (102.6) | 11.4 (28.1) | - | - |
| 2020 | 67.0 (165.5) | 4.7 (11.6) | - | - |
| 2025 | 38.9 (96.0) | 4.7 (11.6) | 1.7 (4.3) | - |

**Table 10-12.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | 2 | 3 | 56 | 39 | 3 | - | - |
| 2000 | 6 | - | 80 | 1 | 57 | - | - |
| 2005 | 7 | - | 30 | - | 4 | - | 30 |
| 2010 | - | - | 8 | - | 2 | - | 11 |
| 2015 | - | 5 | 25 | - | - | 1 | 2 |
| 2020 | - | 4 | 18 | 4 | 0 | 2 | - |
| 2025 | - | - | 3 | 22 | - | 1 | 3 |
| year | Average Cover (%) | | | | | | |
| 1995 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | - | - |
| 2000 | 0.1 | - | 1.4 | 0.0 | 0.7 | - | - |
| 2005 | 0.0 | - | 0.1 | - | 0.0 | - | 0.1 |
| 2010 | - | - | 0.1 | - | 0.1 | - | 0.0 |
| 2015 | - | 0.0 | 0.1 | - | - | 0.0 | 0.0 |
| 2020 | - | 0.0 | 0.4 | 0.0 | 0.0 | 0.1 | - |
| 2025 | - | - | 0.1 | 0.3 | - | 0.0 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-12.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Chorispora tenella[ai] (crossflower) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | unknown annual forb[a] (unknown forb) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | - | 95 | - | 2 | 157 | 12 | - | - | - | 4 |
| 2000 | - | - | - | - | 3 | - | - | - | - | - |
| 2005 | 23 | 79 | - | - | 58 | 14 | - | - | 8 | - |
| 2010 | - | - | - | - | 3 | 10 | - | - | 22 | - |
| 2015 | 2 | 12 | - | - | 89 | 38 | 4 | 3 | 29 | - |
| 2020 | 2 | - | - | - | - | 26 | - | - | 1 | - |
| 2025 | - | - | 5 | - | - | 3 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | - | 0.3 | - | 0.0 | 1.5 | 0.1 | - | - | - | 0.0 |
| 2000 | - | - | - | - | 0.0 | - | - | - | - | - |
| 2005 | 0.4 | 0.2 | - | - | 0.8 | 0.1 | - | - | 0.1 | - |
| 2010 | - | - | - | - | 0.0 | 0.0 | - | - | 0.3 | - |
| 2015 | 0.0 | 0.0 | - | - | 0.4 | 0.4 | 0.0 | 0.0 | 0.1 | - |
| 2020 | 0.0 | - | - | - | - | 0.3 | - | - | 0.0 | - |
| 2025 | - | - | 0.0 | - | - | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-12.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Atriplex confertifolia[p] (shadscale saltbush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (prickly pear) | Sarcobatus vermiculatus (greasewood) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 0.1 | 32.9 | - | 0 | - | 0.8 | - | 3.4 |
| 2010 | 0.9 | 25.9 | - | - | 0.1 | - | - | 3.8 |
| 2015 | 14.1 | 28.1 | - | 0.1 | 0.4 | 0.5 | - | 4.9 |
| 2020 | - | 25.6 | - | - | - | 0.5 | - | 5.3 |
| 2025 | 2.2 | 25.9 | 0.4 | 0.3 | 0.2 | 0.4 | - | 5.5 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | 1.9 | 32.0 | - | 1.7 | 0.0 | 0.1 | - | 2.4 |
| 2000 | 3.0 | 32.3 | - | 1.0 | 0.1 | 0.2 | 0.0 | 5.3 |
| 2005 | 0.2 | 26.7 | - | 0.0 | - | 0.4 | - | 3.6 |
| 2010 | 1.3 | 24.1 | - | - | 0.0 | - | - | 3.3 |
| 2015 | 12.9 | 27.7 | - | 0.0 | 0.7 | 0.0 | - | 3.7 |
| 2020 | 0.0 | 24.8 | - | - | - | 0.0 | - | 4.4 |
| 2025 | 2.8 | 24.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | 5.7 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-12.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 2040 | 600 | 20 | 80 | 0 | 0 | 0 | 0 | 28/24 |
| 2000 | 3700 | 40 | 15 | 85 | 0 | 1 | 0 | 0 | 12/22 |
| 2005 | 1300 | 840 | 31 | 57 | 12 | 8 | 0 | 11 | 11/11 |
| 2010 | 3120 | 20 | 21 | 80 | 0 | 13 | 3 | 3 | 15/18 |
| 2015 | 22480 | 9940 | 53 | 47 | 0 | 3 | 0 | 0 | 21/28 |
| 2020 | 240 | - | 50 | 8 | 42 | 0 | 25 | 75 | 9/13 |
| 2025 | 9100 | 80 | 19 | 81 | 0 | 6 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 7580 | 240 | 3 | 78 | 19 | 65 | 20 | 3 | 69/80 |
| 2000 | 7260 | 60 | 6 | 53 | 42 | 38 | 18 | 13 | 66/82 |
| 2005 | 7740 | 4100 | 1 | 54 | 45 | 54 | 23 | 9 | 74/86 |
| 2010 | 9280 | 3080 | 36 | 43 | 21 | 41 | 9 | 18 | 63/74 |
| 2015 | 8520 | 80 | 27 | 56 | 17 | 31 | 32 | 15 | 65/76 |
| 2020 | 8340 | 60 | 42 | 31 | 28 | 27 | 15 | 29 | 63/69 |
| 2025 | 8240 | 200 | 15 | 64 | 21 | 52 | 26 | 20 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 0 | 100 | 100 | 0 | 0 | 108/56 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 40 | - | 0 | 0 | 100 | 50 | 0 | 50 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex confertifolia[p] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | 380 | 160 | 11 | 74 | 16 | 0 | 0 | 0 | 56/67 |
| 2000 | 520 | - | 19 | 62 | 19 | 12 | 8 | 15 | 49/67 |
| 2005 | 160 | 20 | 13 | 38 | 50 | 25 | 38 | 50 | 59/47 |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 41/40 |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 14/23 |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 47/43 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 60 | 180 | 0 | 100 | 0 | 0 | 0 | 0 | 25/17 |
| 2000 | 900 | - | 20 | 80 | 0 | 0 | 0 | 0 | 11/16 |
| 2005 | 60 | 140 | 33 | 67 | 0 | 0 | 33 | 0 | 7/5 |
| 2010 | 200 | - | 10 | 90 | 0 | 0 | 0 | 10 | 13/13 |
| 2015 | 2800 | 3360 | 87 | 13 | 0 | 0 | 0 | 0 | 14/14 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 7/7 |
| 2025 | 720 | - | 28 | 72 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 140 | 20 | 43 | 57 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 160 | - | 50 | 0 | 50 | 13 | 0 | 50 | - / - |
| 2010 | 80 | - | 75 | 25 | 0 | 25 | 0 | 75 | - / - |
| 2015 | 100 | 20 | 80 | 20 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 100 | - | 80 | 0 | 20 | 0 | 0 | 60 | - / - |
| 2025 | 100 | - | 80 | 20 | 0 | 20 | 0 | 20 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/11 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/24 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/9 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 12/51 |
| 2020 | - | - | - | - | - | - | - | - | 10/20 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1995 | 2360 | - | 0 | 98 | 2 | 0 | 0 | 0 | 88/119 |
| 2000 | 800 | - | 8 | 63 | 30 | 15 | 10 | 13 | 91/117 |
| 2005 | 940 | 20 | 2 | 64 | 34 | 72 | 28 | 9 | 86/117 |
| 2010 | 780 | - | 44 | 46 | 10 | 10 | 0 | 10 | 86/101 |
| 2015 | 660 | 20 | 9 | 91 | 0 | 24 | 18 | 15 | 86/125 |
| 2020 | 900 | 20 | 20 | 56 | 24 | 0 | 11 | 27 | 88/123 |
| 2025 | 1040 | - | 14 | 83 | 4 | 27 | 10 | 4 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

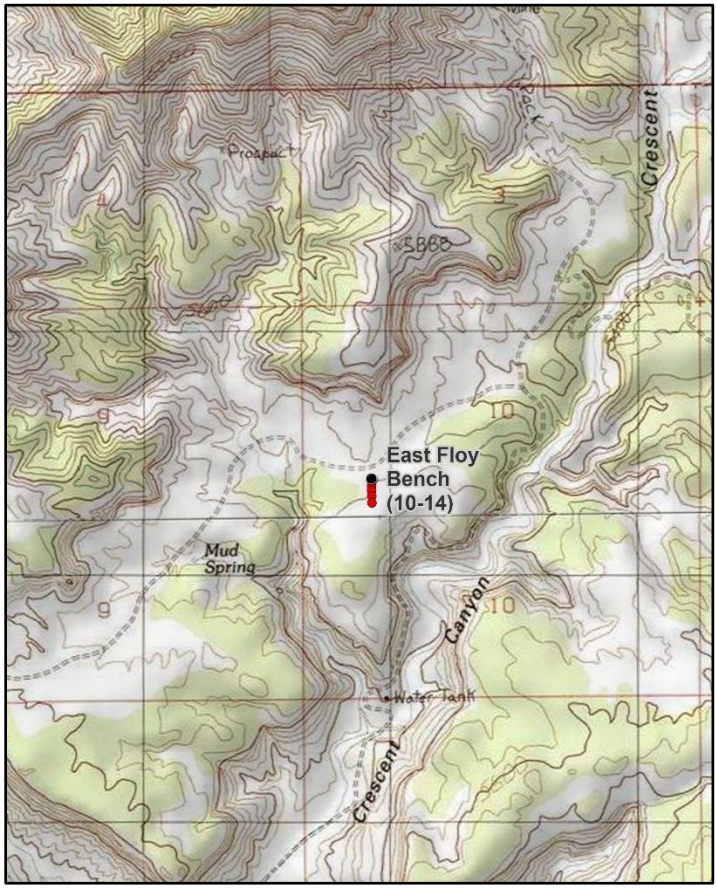
**Table 10-12.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

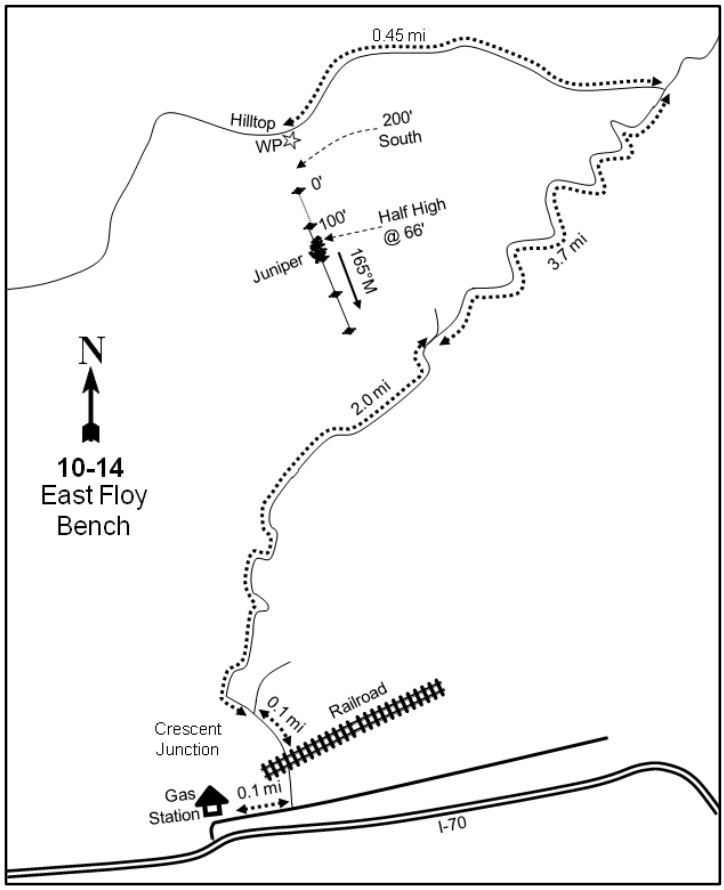
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 86 | - | - | - | - | - | 1.9 |
| 2015 | 31 | - | 100 | - | - | - | 2.5 |
| 2020 | 37 | - | 100 | - | - | - | 3.2 |
| 2025 | 39 | 8 | 83 | - | 8 | - | 2.8 |

**Table 10-12.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 30.0 | 9.7 | 2.2 | 0.9 | 0.0 | 0.0 | 0.0 | **42.8** | Poor |
| 2000 | 30.0 | 3.7 | 3.4 | 4.2 | 0.0 | 0.0 | 0.0 | **41.3** | Poor |
| 2005 | 30.0 | 1.4 | 0.5 | 0.4 | 0.0 | 0.1 | 0.0 | **32.4** | Very Poor |
| 2010 | 30.0 | 8.8 | 15.0 | 0.3 | 0.0 | 0.5 | 0.0 | **54.6** | Fair |
| 2015 | 30.0 | 11.6 | 15.0 | 0.3 | 0.0 | 0.3 | 0.0 | **57.2** | Fair |
| 2020 | 30.0 | 6.6 | 15.0 | 1.2 | 0.0 | 0.1 | 0.0 | **52.9** | Fair |
| 2025 | 30.0 | 9.1 | 7.6 | 0.8 | 0.0 | 0.0 | 0.0 | **47.5** | Poor |

# EAST FLOY BENCH - STUDY NO. 10-14




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Floy Canyon South SE; Township 21S, Range 19E, Section 10 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 602868 East 4317594 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 7897 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 1: No Rebar; Line 2: 50ft Long |

**Directions to Site**

Start from Crescent Junction off of I-70 and east of Green River. From the paved road 0.1 miles east of the gas station and SR-163 junction, cross the east-west running tracks. After the tracks, travel for 0.1 miles and turn left onto a dirt road. Go north 2 miles on the main dirt road to a fork. Bear right and proceed 3.7 miles to a fork on top of a hill. Stay left and climb out of the wash and up the west side of the canyon. Turn left and continue 0.45 miles to the crest of a small hill where there is a rebar witness post 10 feet off of the left (south) side of the road. The 0-foot baseline stake, marked with browse tag #7897, is 200 feet south of the witness post.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | CRESCENT CANYON |
| Elevation | 5,600ft (1,707m) |
| Aspect | West |
| Slope | 3-10% |
| Sample Dates | 09/21/1995, 05/31/2000, 06/02/2005, 06/03/2010, 05/28/2015, 05/27/2020, 05/28/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-14.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-14.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush | Early Phase I |
| 1995 | Wyoming Big Sagebrush | Early Phase I |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush | Phase I |
| 2010 | Wyoming Big Sagebrush | Phase I |
| 2015 | Wyoming Big Sagebrush | Phase I |
| 2020 | Wyoming Big Sagebrush | Phase I |
| 2025 | Wyoming Big Sagebrush | Phase I |

## Site Notes

No Notes

## Soils

**Table 10-14.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 8.0 | 60.0 | 23.4 | 16.6 | 0.6 | 4.3 | 185.6 | 0.5 | 05/31/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1986 - Current Potential State: Community Phase 2.1<br>1995-2025 - Juniper Encroachment State: Community Phase 3.1 |

Since study establishment in 1986, the plant community on this site has remained in a generally stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) as the dominant component (Photos, Pre-1992 Data, Table 10-14.12, Table 10-14.13). The herbaceous understory has remained moderately diverse and abundant. Native perennial grass species have contributed moderate amounts of cover over the sample period. The introduced annual grass species cheatgrass (*Bromus tectorum*) has also been observed from year to year with fluctuating cover, but cover was low in 2025. Forbs have remained rare (Table 10-14.7, Table 10-14.10, Table 10-14.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees have been present in all sample years (Photos, Table 10-14.12, Table 10-14.13, Table 10-14.14). Although the site has remained in Phase I of woodland succession since 2005 (Table 10-14.4), there may be potential for infilling over time.

This site's condition as mule deer winter range has ranged between poor-fair and fair since 1995; winter range condition was considered to be fair in 2025. Factors that negatively influence condition as deer winter range include a lack of preferred browse cover, and perennial grass and forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 10-14.10, Table 10-14.11, Table 10-14.12, Table 10-14.15). According to pellet transect data deer presence has ranged between low and high over the course of the study; deer presence was at its highest in 2010. The highest percentages of Wyoming big sagebrush and fourwing saltbush (*Atriplex canescens*) utilization occurred in 2015 (Table 10-14.9, Table 10-14.13). On-site observations in 2025 noted little to no utilization on the herbaceous community.

## Trend Summary Tables

**Table 10-14.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 5.5 | 4.0 | 2.3 | - | - | - |
| 2000 | 6.1 | 0.8 | 3.1 | - | - | - |
| 2005 | 6.6 | 2.3 | 4.5 | 8.5 | 2.6 | 6.6 |
| 2010 | 8.5 | 1.2 | 4.9 | 8.5 | 1.7 | 7.9 |
| 2015 | 6.2 | 4.0 | 3.1 | 10.2 | 3.6 | 7.0 |
| 2020 | 7.8 | 1.6 | 4.8 | 8.2 | 1.3 | 8.2 |
| 2025 | 7.6 | 1.7 | 5.6 | 9.1 | 2.6 | 7.3 |

**Table 10-14.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 385 | 145 | 127 | 5 | 6.9 | 5.2 | 0.3 | 0.0 |
| 2000 | 65 | 192 | 3 | - | 1.1 | 5.1 | 0.0 | - |
| 2005 | 253 | 165 | 241 | 15 | 9.0 | 3.3 | 4.1 | 0.2 |
| 2010 | 200 | 105 | 139 | 33 | 2.9 | 3.1 | 0.4 | 0.4 |
| 2015 | 330 | 152 | 173 | 36 | 4.2 | 8.0 | 1.5 | 0.5 |
| 2020 | 341 | 119 | 140 | 12 | 5.7 | 4.6 | 2.3 | 0.4 |
| 2025 | 129 | 113 | 4 | 17 | 1.3 | 4.8 | 0.0 | 0.4 |

**Table 10-14.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 39.0 | 10.4 | 31.3 | 0.4 | 1.4 | 23.2 |
| 2000 | 57.2 | 10.0 | 24.7 | 0.4 | 1.2 | 17.8 |
| 2005 | 54.7 | 11.8 | 18.2 | 0.4 | 0.8 | 25.3 |
| 2010 | 54.5 | 7.3 | 25.0 | 0.3 | 0.7 | 21.5 |
| 2015 | 57.9 | 8.9 | 22.5 | 0.3 | 0.9 | 23.8 |
| 2020 | 55.6 | 9.2 | 31.5 | 0.7 | 1.3 | 24.3 |
| 2025 | 57.6 | 7.8 | 28.7 | 0.3 | 0.8 | 20.3 |

**Table 10-14.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit | Rocky Mountain Bighorn Sheep | Domestic Sheep |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1995 | - | 20 | 5 | - | 58 | - | 7 |
| 2000 | 2 | 15 | 3 | - | 42 | - | 4 |
| 2005 | 12 | 10 | 1 | - | 83 | - | - |
| 2010 | 15 | 10 | - | - | 24 | - | - |
| 2015 | 11 | 3 | - | - | 33 | - | - |
| 2020 | 13 | 2 | - | - | 21 | - | - |
| 2025 | 8 | 10 | - | - | 28 | - | - |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | 18.1 (44.8) | 25.5 (62.9) | 6.7 (16.6) | 2.3 (5.7) | - | 3.4 (8.3) | - |
| 2005 | 23.2 (57.4) | 26.8 (66.2) | 4.7 (11.6) | - | - | - | - |
| 2010 | 70.4 (173.9) | 59.0 (145.7) | 4.0 (9.9) | - | - | - | - |
| 2015 | 21.1 (52.0) | 5.3 (13.2) | - | - | - | - | - |
| 2020 | 13.8 (34.1) | 6.7 (16.6) | 1.3 (3.3) | - | - | - | - |
| 2025 | 22.5 (55.6) | 24.8 (61.2) | - | - | - | - | - |

**Table 10-14.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Leymus salinus (saline wildrye) | Pleuraphis jamesii (James' galleta) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 40 | 1 | 381 | 8 | 41 | 17 | 69 | - | 5 | 85 |
| 2000 | 18 | 7 | 62 | 2 | 43 | 13 | 82 | - | 69 | 5 |
| 2005 | 63 | 4 | 185 | 11 | 20 | - | 84 | 6 | 9 | 125 |
| 2010 | 41 | - | 182 | 15 | 6 | - | 55 | 1 | 2 | 44 |
| 2015 | 74 | - | 307 | 23 | 16 | - | 78 | - | 15 | 121 |
| 2020 | 63 | - | 334 | 4 | - | - | 71 | 1 | 4 | 42 |
| 2025 | 70 | - | 129 | 2 | 3 | - | 54 | 1 | - | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 1.9 | 0.0 | 6.7 | 0.1 | 0.9 | 1.1 | 1.1 | - | 0.0 | 0.2 |
| 2000 | 0.3 | 0.1 | 1.1 | 0.0 | 0.9 | 0.2 | 2.0 | - | 1.6 | 0.0 |
| 2005 | 0.5 | 0.3 | 8.1 | 0.2 | 0.5 | - | 1.7 | 0.0 | 0.1 | 0.9 |
| 2010 | 0.7 | - | 2.7 | 0.4 | 0.2 | - | 1.9 | 0.0 | 0.0 | 0.1 |
| 2015 | 3.5 | - | 3.8 | 0.8 | 0.4 | - | 3.2 | - | 0.1 | 0.4 |
| 2020 | 2.0 | - | 5.6 | 0.1 | - | - | 2.4 | 0.0 | 0.0 | 0.1 |
| 2025 | 3.1 | - | 1.3 | 0.0 | 0.0 | - | 1.6 | 0.0 | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-14.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Castilleja angustifolia (northwestern Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis stevioides[a] (Esteve's pincushion) | Chamaesyce (sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) | Halogeton glomeratus[ai] (saltlover) | Lappula occidentalis[a] (flatspine stickseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | 2 | - | - | 3 | 19 | 5 | 10 | - | - | 74 |
| 2000 | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 0 | - | 22 | 1 | - | 3 | 14 | 3 | - | 13 | 52 | 2 | 1 | 78 | - | 130 |
| 2010 | - | - | - | 1 | - | 1 | 3 | - | 20 | - | - | - | 4 | - | 36 | 3 | 69 |
| 2015 | 2 | - | - | - | - | 4 | - | - | - | 11 | 9 | 11 | 9 | - | 8 | 3 | 20 |
| 2020 | 48 | - | 1 | 18 | - | - | - | - | - | - | 25 | - | - | - | 2 | - | 5 |
| 2025 | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.1 |
| 2000 | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.1 | 0.0 | - | 0.3 | 0.2 | 0.0 | 0.0 | 0.4 | - | 1.7 |
| 2010 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.1 | - | - | - | 0.0 | - | 0.1 | 0.0 | 0.1 |
| 2015 | 0.0 | - | - | - | - | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.0 | 0.0 | 0.0 |
| 2020 | 1.0 | - | 0.0 | 0.0 | - | - | - | - | - | - | 0.4 | - | - | - | 0.0 | - | 0.0 |
| 2025 | 0.0 | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lepidium[a] (pepperweed) | Machaeranthera grindelioides (rayless tansyaster) | Malcolmia africana[ai] (African mustard) | Mentzelia[a] (blazingstar) | Navarretia intertexta[a] (needleleaf navarretia) | Oenothera (evening primrose) | Packera multilobata (lobeleaf groundsel) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | 45 | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | 2 | - | - |
| 2005 | 3 | 1 | - | 5 | 37 | 4 | - | 61 | 11 | 5 | - |
| 2010 | 7 | - | 1 | 4 | - | - | - | 37 | 13 | 8 | - |
| 2015 | 59 | 10 | - | - | 3 | - | 1 | 98 | 3 | 14 | 1 |
| 2020 | 4 | - | - | - | - | - | - | 74 | - | 11 | - |
| 2025 | - | - | - | - | - | - | - | 4 | - | 16 | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | 0.1 | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | 0.0 | - | - |
| 2005 | 0.0 | 0.0 | - | 0.0 | 1.1 | 0.0 | - | 0.2 | 0.0 | 0.1 | - |
| 2010 | 0.0 | - | 0.0 | 0.0 | - | - | - | 0.1 | 0.1 | 0.3 | - |
| 2015 | 0.2 | 0.2 | - | - | 0.0 | - | 0.0 | 1.2 | 0.0 | 0.2 | 0.0 |
| 2020 | 0.0 | - | - | - | - | - | - | 0.7 | - | 0.3 | - |
| 2025 | - | - | - | - | - | - | - | 0.0 | - | 0.3 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-14.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Atriplex confertifolia[p] (shadscale saltbush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Ephedra viridis[p] (mormon tea) | Ericameria nauseosa (rubber rabbitbrush) | Eriogonum microthecum[p] (slender buckwheat) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 3.9 | 1.4 | - | - | 2 | - | - | 0.9 | 2.6 | 6.6 | 0.3 | 0 |
| 2010 | 5.1 | 1.3 | - | 0.1 | 1 | - | - | 0.7 | 1.6 | 7.9 | 0.4 | - |
| 2015 | 7.7 | 0.9 | - | 0.3 | 0.5 | - | - | 0.7 | 3.3 | 7 | 0.4 | 0 |
| 2020 | 5.6 | 0.6 | - | 0.8 | 0.3 | - | - | 0.7 | 0.4 | 8.2 | 1 | 0.1 |
| 2025 | 7.1 | 0.9 | - | 0.6 | 0.4 | - | - | 0.2 | 2 | 7.3 | 0.5 | - |
| year | Quadrat Cover (%) | | | | | | | | | | | |
| 1995 | 4.2 | 0.6 | 0.0 | 0.2 | - | - | 0.0 | 0.3 | 3.8 | 2.3 | 0.5 | - |
| 2000 | 3.3 | 0.1 | 0.9 | 0.4 | 1.5 | - | - | 0.1 | 0.3 | 3.1 | 0.2 | 0.0 |
| 2005 | 3.4 | 0.8 | - | 0.3 | 1.3 | - | - | 0.6 | 1.9 | 4.5 | 0.5 | 0.0 |
| 2010 | 5.6 | 1.2 | - | 0.2 | 0.8 | - | - | 0.8 | 1.0 | 4.9 | 0.2 | - |
| 2015 | 4.2 | 0.7 | - | 0.5 | 0.3 | - | - | 0.7 | 3.5 | 3.1 | 0.3 | 0.0 |
| 2020 | 6.0 | 0.0 | 0.9 | 0.1 | 0.3 | 0.9 | - | 0.0 | 0.6 | 4.8 | 0.6 | 0.0 |
| 2025 | 6.0 | 0.7 | - | 0.0 | 0.3 | - | - | 0.0 | 1.7 | 5.6 | 0.6 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-14.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 1060 | 140 | 23 | 76 | 2 | 59 | 4 | 13 | 56/87 |
| 2000 | 940 | - | 4 | 68 | 28 | 68 | 11 | 19 | 57/94 |
| 2005 | 1100 | - | 4 | 58 | 38 | 49 | 46 | 7 | 67/101 |
| 2010 | 840 | - | 10 | 71 | 19 | 86 | 7 | 17 | 53/100 |
| 2015 | 840 | 80 | 0 | 76 | 24 | 26 | 67 | 24 | 48/100 |
| 2020 | 760 | - | 0 | 82 | 18 | 21 | 42 | 34 | 52/94 |
| 2025 | 800 | - | 0 | 85 | 15 | 70 | 25 | 13 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | 69/95 |
| 2000 | 300 | 20 | 0 | 7 | 93 | 33 | 0 | 73 | 60/72 |
| 2005 | 260 | - | 15 | 77 | 8 | 31 | 39 | 0 | 67/85 |
| 2010 | 200 | - | 10 | 90 | 0 | 50 | 30 | 0 | 65/86 |
| 2015 | 220 | - | 9 | 64 | 27 | 46 | 46 | 9 | 64/96 |
| 2020 | 80 | - | 25 | 50 | 25 | 25 | 0 | 50 | 71/89 |
| 2025 | 180 | - | 0 | 56 | 44 | 0 | 0 | 44 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 60 | 20 | 0 | 70/103 |
| 2000 | 160 | 80 | 13 | 13 | 75 | 63 | 0 | 0 | 52/111 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 28/66 |
| 2020 | - | - | - | - | - | - | - | - | 36/79 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 200 | - | 30 | 50 | 20 | 0 | 0 | 10 | 42/86 |
| 2000 | 200 | 20 | 10 | 80 | 10 | 0 | 10 | 10 | 25/53 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 35/48 |
| 2010 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 27/50 |
| 2015 | 160 | - | 25 | 75 | 0 | 13 | 0 | 13 | 31/52 |
| 2020 | 140 | - | 0 | 86 | 14 | 0 | 0 | 14 | 28/49 |
| 2025 | 140 | - | 0 | 57 | 43 | 0 | 0 | 43 | - / - |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1995 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 155/240 |
| 2000 | 200 | - | 40 | 50 | 10 | 60 | 20 | 0 | 64/64 |
| 2005 | 380 | - | 21 | 79 | 0 | 79 | 0 | 0 | 80/118 |
| 2010 | 360 | - | 61 | 39 | 0 | 11 | 0 | 0 | 62/83 |
| 2015 | 300 | - | 13 | 67 | 20 | 0 | 87 | 47 | 56/86 |
| 2020 | 460 | - | 9 | 91 | 0 | 17 | 0 | 22 | 55/88 |
| 2025 | 560 | - | 0 | 100 | 0 | 0 | 18 | 0 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1995 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 80 | - | 0 | 100 | 0 | 50 | 50 | 0 | 16/21 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 13/30 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/31 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 37/65 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 37/57 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. consimilis var. oreophila -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 54/51 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 47/51 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 42/82 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[P] -- (spiny hopsage) | | | | | | | | | |
| 1995 | 120 | - | 0 | 50 | 50 | 0 | 0 | 0 | 62/112 |
| 2000 | 40 | - | 0 | 0 | 100 | 100 | 0 | 100 | 51/98 |
| 2005 | 120 | - | 0 | 67 | 33 | 0 | 83 | 33 | 68/114 |
| 2010 | 80 | - | 0 | 100 | 0 | 50 | 50 | 0 | 50/85 |
| 2015 | 80 | - | 0 | 75 | 25 | 25 | 50 | 0 | 54/89 |
| 2020 | 80 | - | 0 | 50 | 50 | 50 | 0 | 50 | 57/93 |
| 2025 | 60 | - | 0 | 100 | 0 | 33 | 33 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 6140 | 40 | 2 | 98 | 0 | 0 | 0 | 0 | 23/27 |
| 2000 | 960 | - | 0 | 69 | 31 | 2 | 0 | 17 | 16/23 |
| 2005 | 3280 | 240 | 7 | 93 | 0 | 2 | 0 | 0 | 26/31 |
| 2010 | 8060 | 80 | 51 | 48 | 2 | 0 | 0 | 2 | 17/22 |
| 2015 | 8460 | 140 | 51 | 49 | 0 | 0 | 0 | 0 | 19/25 |
| 2020 | 3820 | 1060 | 80 | 19 | 1 | 0 | 0 | 1 | 13/15 |
| 2025 | 1800 | - | 0 | 94 | 6 | 0 | 0 | 6 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | 260 | - | 8 | 92 | 0 | 77 | 0 | 0 | 43/46 |
| 2000 | 180 | - | 0 | 100 | 0 | 33 | 0 | 0 | 27/47 |
| 2005 | 360 | 300 | 33 | 67 | 0 | 6 | 67 | 0 | 37/40 |
| 2010 | 380 | 220 | 11 | 90 | 0 | 0 | 11 | 0 | 40/45 |
| 2015 | 420 | - | 29 | 71 | 0 | 33 | 19 | 0 | 29/33 |
| 2020 | 380 | - | 47 | 53 | 0 | 53 | 5 | 0 | 30/42 |
| 2025 | 480 | - | 0 | 96 | 4 | 25 | 75 | 4 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/64 |
| 2000 | 80 | - | 0 | 75 | 25 | 0 | 0 | 0 | 14/51 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 25 | 16/52 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/35 |
| 2015 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/38 |
| 2020 | 100 | - | 0 | 60 | 40 | 0 | 0 | 40 | 13/28 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

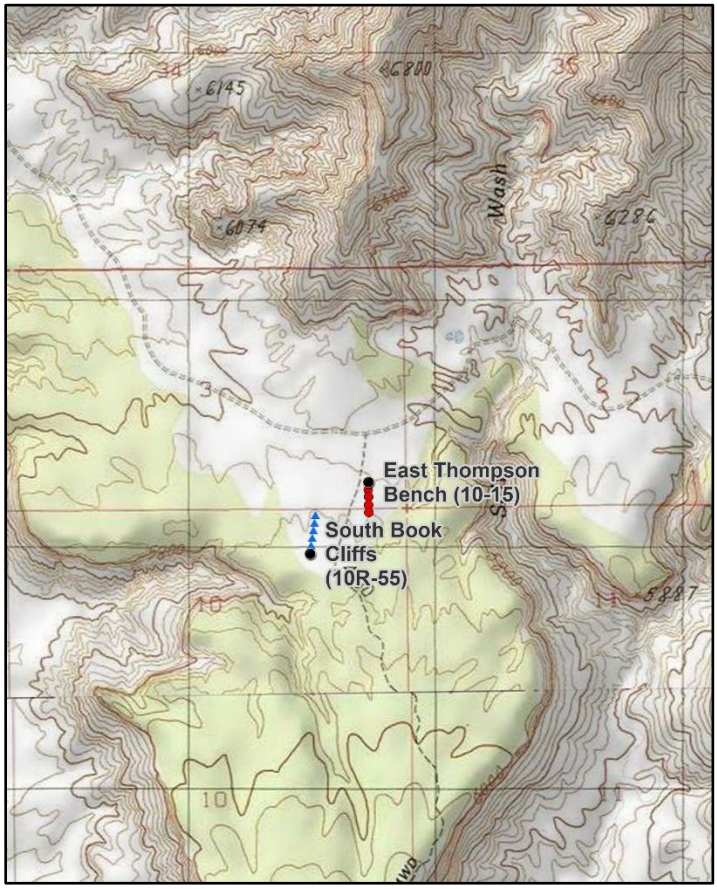
**Table 10-14.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

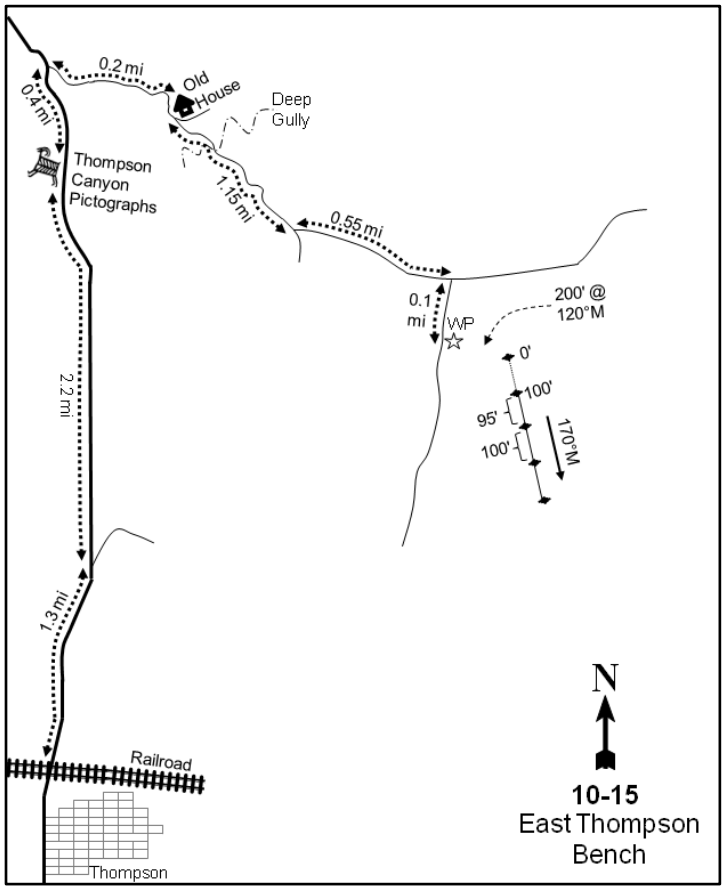
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 10 | - | - | - | - | - | 17.3 |
| 2000 | 16 | - | - | - | - | - | 10.9 |
| 2005 | 23 | - | - | 23 | 23 | 54 | 26.7 |
| 2010 | 20 | - | - | 55 | 27 | 18 | 18.3 |
| 2015 | 19 | - | - | 10 | 40 | 50 | 23.8 |
| 2020 | 25 | 7 | 7 | 27 | 40 | 20 | 25.9 |
| 2025 | 23 | - | - | - | 62 | 38 | 50.0 |

**Table 10-14.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 6.8 | 13.7 | 9.6 | 10.3 | -5.2 | 0.0 | 0.0 | **35.2** | Fair |
| 2000 | 7.4 | 6.3 | 7.0 | 10.2 | -0.8 | 0.0 | 0.0 | **30.1** | Fair |
| 2005 | 10.4 | 8.2 | 5.2 | 6.6 | -6.7 | 0.3 | 0.0 | **24.0** | Poor-Fair |
| 2010 | 10.5 | 11.6 | 7.5 | 6.3 | -2.1 | 0.9 | 0.0 | **34.7** | Fair |
| 2015 | 12.6 | 8.0 | 1.3 | 15.9 | -3.2 | 1.1 | 0.0 | **35.7** | Fair |
| 2020 | 10.1 | 9.3 | 4.0 | 9.2 | -4.3 | 0.7 | 0.0 | **29.0** | Fair |
| 2025 | 11.3 | 10.2 | 0.0 | 9.6 | -0.9 | 0.7 | 0.0 | **30.9** | Fair |

# EAST THOMPSON BENCH - STUDY NO. 10-15




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Sego Canyon SE; Township 21S, Range 20E, Section 03 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 613672 East 4318449 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 7898 |
| Transect Bearing | 170° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard; Line 2: 95ft Long |

**Directions to Site**

From the railroad crossing in the town of Thompson, travel 1.3 miles north up the main road to a fork. Stay left, go 2.2 miles to the Thompson Canyon pictographs, and continue for 0.4 miles. Make a sharp right turn and go 0.2 miles past an old house and a railroad cut to a fork. Turn right, crossing a deep gully, and travel 1.15 miles to a fork. Stay left and continue 0.55 miles to a very faint road on the right. Turn onto this road and go 0.1 miles to a steel rebar witness post on the left (east) side of the road. The first baseline stake is 200 feet away from the witness post at a bearing of 120 degrees magnetic.

| Site Information | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | CISCO |
| Elevation | 5,800ft (1,768m) |
| Aspect | Northwest |
| Slope | 5-8% |
| Sample Dates | 06/14/1995, 05/31/2000, 06/02/2005, 06/03/2010, 05/28/2015, 05/27/2020, 06/03/2025 |

**Table 10-15.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial Before | South Book Cliffs Vegetation Improvement Phase 1 | 2593 | October 2013 | 500 |
| Mechanical - Bullhog | South Book Cliffs Vegetation Improvement Phase 1 | 2593 | November-December 2013 | 500 |
| Seeding - Aerial After | South Book Cliffs Vegetation Improvement Phase 1 | 2593 | January 2014 | 500 |

**Table 10-15.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| South Book Cliffs I | | | Aerial | Oct 2013 | 315 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Emery UT | 0.16 | 0.11 |
| G | Achnatherum hymenoides | Indian Ricegrass | Rio Grande CO | 3.02 | 2.86 |
| G | Pascopyrum smithii | Western Wheatgrass | Arriba | 2.38 | 2.13 |
| G | Pleuraphis jamesii | Galleta | | 0.48 | 0.35 |
| G | Pleuraphis jamesii | Galleta | | 0.32 | 0.19 |
| G | Poa secunda | Sandberg Bluegrass | UP/Colorado Plateau | 0.63 | 0.47 |
| G | Sporobolus cryptandrus | Sand Dropseed | Washington CO | 0.08 | 0.08 |
| F | Linum perenne | Blue Flax | Appar | 1.59 | 1.38 |
| F | Sanguisorba minor | Small Burnet | | 1.59 | 1.46 |
| F | Sphaeralcea coccinea | Scarlet Globemallow | | 0.10 | 0.04 |
| S | Atriplex canescens | Fourwing Saltbush | Kane UT | 0.11 | 0.04 |
| S | Atriplex canescens | Fourwing Saltbush | Kane UT | 3.02 | 1.12 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| South Book Cliffs 1 Shrub | | | Aerial | Jan 2014 | 500 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Uintah UT | 1.00 | 0.14 |

## Wildlife Habitat and Vegetation History

**Table 10-15.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-15.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush | Phase I |
| 1995 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 2000 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 2005 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II |
| 2010 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II |
| 2015 | Perennial Forb/Perennial Grass | Early Phase I |
| 2020 | Perennial Grass | Early Phase I |
| 2025 | Perennial Grass | Early Phase I |

## Site Notes

The soil erosion condition is considered to be slight-moderate as of 2025 and has appeared active since 2010 despite good ground cover provided by vegetation and litter (Table 10-15.8). Multiple stakes and rebar belt markers are scattered throughout the area; care should be taken to ensure that the transect is set up correctly.

## Soils

**Table 10-15.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.5 | 50.0 | 28.0 | 22.0 | 0.7 | 1.7 | 48.0 | 0.6 | 05/31/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1986-2000 - Juniper Encroachment State: Community Phase 3.1<br>2005-2010 - Juniper Encroachment State: Community Phase 3.2<br>2015-2025 - Current Potential State: Community Phase 2.3 |

The plant community on this site was dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) upon study establishment in 1986 (Pre-1992 Data). Encroachment of twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees continued over time and they were a co-dominant vegetation component from 1995 through the 2010 sample year. However, a 2013 bullhog and seeding treatment (Table 10-15.1) removed most of the trees, and the study site has been considered to be within Early Phase I of woodland succession since 2015 (Table 10-15.4). Sagebrush has decreased substantially over time, but cover has slightly increased overall since 2015 (Photos, Table 10-15.6, Table 10-15.12, Table 10-15.13, Table 10-15.14). The herbaceous understory remained relatively poor in both composition and abundance through 2010, but increased following treatment: the site transitioned to one dominated by perennial grasses and forbs in 2015 and perennial grasses in 2020 and 2025. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed in many sample years, but with generally low cover and abundance (Table 10-15.7, Table 10-15.10, Table 10-15.11).

Condition of mule deer winter range on this site has ranged between very poor-poor and good since 1995; winter range condition was considered to be good in 2025. Negative factors contributing to this condition include decadence and a lack of recruitment of young within the preferred browse community; a lack of preferred browse cover; reduced perennial grass cover; and the amount of annual grass cover (Table 10-15.6, Table 10-15.7, Table 10-15.13, Table 10-15.15). Pellet transect data indicates that deer presence was moderate in most sample years but was low in 2015 and 2020. However, over 80% of fourwing saltbush (*Atriplex canescens*) plants sampled in density strips have shown signs of moderate to heavy use since 2015. In addition, 62% of sagebrush plants sampled in density strips showed that level of utilization in 2025. Elk were present in low amounts for all years sampled (Table 10-15.9, Table 10-15.13). On-site observations for 2025 note that moderate to heavy utilization was evident on woody species.

## Trend Summary Tables

**Table 10-15.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 5.2 | 0.6 | 11.8 | - | - | - |
| 2000 | 6.0 | 0.4 | 13.1 | - | - | - |
| 2005 | 2.1 | 0.5 | 12.8 | 7.3 | 0.1 | 20.6 |
| 2010 | 1.7 | 0.3 | 18.6 | 1.4 | 0.2 | 29.4 |
| 2015 | 1.8 | 2.7 | 0.5 | 1.6 | 2.5 | 0.4 |
| 2020 | 6.3 | 0.7 | 0.9 | 4.5 | 1.7 | 0.1 |
| 2025 | 4.7 | 2.2 | 1.2 | 6.2 | 3.0 | 1.5 |

**Table 10-15.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 314 | 144 | 232 | 76 | 1.8 | 2.3 | 0.8 | 0.5 |
| 2000 | 34 | 143 | 23 | 39 | 0.1 | 3.1 | 0.1 | 0.3 |
| 2005 | 126 | 129 | 304 | 58 | 0.9 | 4.6 | 10.3 | 1.2 |
| 2010 | 49 | 104 | 97 | 45 | 0.2 | 3.2 | 0.2 | 0.8 |
| 2015 | 194 | 179 | 166 | 129 | 1.2 | 5.3 | 0.9 | 4.1 |
| 2020 | 224 | 251 | 146 | 84 | 1.7 | 14.7 | 1.5 | 2.5 |
| 2025 | 146 | 247 | 32 | 54 | 2.4 | 14.4 | 0.1 | 1.0 |

**Table 10-15.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 30.6 | 9.8 | 34.7 | 0.1 | 0.7 | 26.5 |
| 2000 | 47.2 | 13.6 | 34.6 | 0.8 | 0.2 | 25.7 |
| 2005 | 52.8 | 5.2 | 27.8 | 0.8 | 0.1 | 26.5 |
| 2010 | 45.5 | 4.8 | 39.4 | 0.5 | - | 27.6 |
| 2015 | 37.7 | 5.1 | 48.8 | 0.2 | 0.3 | 17.3 |
| 2020 | 33.3 | 1.3 | 56.9 | 0.3 | - | 30.3 |
| 2025 | 38.3 | 0.7 | 52.9 | 1.0 | 0.2 | 22.4 |

**Table 10-15.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 37 | - | 43 |
| 2000 | - | 19 | 8 | 36 |
| 2005 | - | 31 | 6 | 58 |
| 2010 | 2 | 17 | - | 15 |
| 2015 | - | 29 | 1 | 32 |
| 2020 | - | 21 | 3 | 20 |
| 2025 | - | 36 | 2 | 45 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 36.2 (89.4) | 0.7 (1.7) | - |
| 2005 | - | 45.6 (112.6) | 4.7 (11.6) | - |
| 2010 | - | 34.9 (86.1) | 5.3 (13.2) | - |
| 2015 | - | 16.1 (39.7) | - | - |
| 2020 | - | 19.4 (48.0) | 9.4 (23.2) | - |
| 2025 | - | 36.8 (91.0) | - | - |

**Table 10-15.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Leymus salinus (saline wildrye) | Pascopyrum smithii (western wheatgrass) | Pleuraphis jamesii (James' galleta) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1995 | 1 | 217 | 55 | 32 | - | 69 | 17 | - | 226 |
| 2000 | 4 | 34 | 53 | 17 | - | 92 | 5 | - | - |
| 2005 | 9 | 73 | 34 | 18 | - | 66 | 17 | - | 82 |
| 2010 | 7 | 44 | 37 | 12 | - | 47 | 19 | - | 8 |
| 2015 | 4 | 179 | 91 | 22 | 17 | 67 | 14 | 3 | 55 |
| 2020 | 27 | 217 | 107 | 29 | 46 | 89 | 22 | 4 | 17 |
| 2025 | 19 | 136 | 55 | 45 | 64 | 84 | 58 | - | 28 |
| year | Average Cover (%) | | | | | | | | |
| 1995 | 0.0 | 1.4 | 0.8 | 0.6 | - | 0.7 | 0.0 | - | 0.4 |
| 2000 | 0.2 | 0.1 | 0.4 | 0.5 | - | 2.0 | 0.0 | - | - |
| 2005 | 0.3 | 0.3 | 0.8 | 1.2 | - | 2.3 | 0.2 | - | 0.5 |
| 2010 | 0.7 | 0.1 | 1.2 | 0.2 | - | 1.0 | 0.1 | - | 0.0 |
| 2015 | 0.1 | 1.1 | 2.2 | 0.3 | 0.2 | 2.4 | 0.1 | 0.0 | 0.1 |
| 2020 | 0.7 | 1.6 | 3.7 | 2.2 | 1.9 | 5.7 | 0.3 | 0.0 | 0.0 |
| 2025 | 1.2 | 2.2 | 2.8 | 2.8 | 1.6 | 4.8 | 1.3 | - | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-15.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella hutchinsifolia[a] (desert pale gilia) | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Astragalus (milkvetch) | Astragalus flexuosus (flexile milkvetch) | Astragalus mollissimus (woolly locoweed) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus nuttallii (sego lily) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chamaesyce fendleri (Fendler's sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cryptantha humilis (roundspike cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 77 | - | - | 5 | 21 | - | - | 17 | 8 | - | 1 | 1 | 16 | - | 28 | - | 6 |
| 2000 | 3 | - | - | 5 | 21 | - | - | 1 | - | 1 | 1 | - | - | - | - | - | 5 |
| 2005 | 136 | - | - | 4 | 17 | - | - | 22 | - | - | 4 | 5 | 2 | - | 34 | 1 | 0 |
| 2010 | 10 | - | - | - | 11 | - | - | 19 | - | - | 5 | - | 1 | - | - | - | 5 |
| 2015 | 5 | 110 | 3 | - | 18 | 4 | 1 | 4 | - | - | 8 | 4 | 1 | - | 30 | - | 2 |
| 2020 | - | 81 | - | - | 14 | - | - | 1 | - | - | 19 | - | 14 | - | 36 | - | 2 |
| 2025 | - | 29 | - | - | 8 | - | - | - | - | - | 27 | - | 17 | 1 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.2 | - | - | 0.0 | 0.3 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.1 | - | 0.0 |
| 2000 | 0.0 | - | - | 0.0 | 0.3 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | - | - | - | 0.0 |
| 2005 | 1.1 | - | - | 0.0 | 1.0 | - | - | 0.1 | - | - | 0.0 | 0.0 | 0.0 | - | 0.2 | 0.0 | 0.0 |
| 2010 | 0.0 | - | - | - | 0.4 | - | - | 0.1 | - | - | 0.1 | - | 0.0 | - | - | - | 0.2 |
| 2015 | 0.0 | 0.3 | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | 0.1 | - | 0.0 |
| 2020 | - | 0.7 | - | - | 0.8 | - | - | 0.0 | - | - | 0.4 | - | 0.4 | - | 0.2 | - | 0.0 |
| 2025 | - | 0.1 | - | - | 0.3 | - | - | - | - | - | 0.2 | - | 0.3 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Eriogonum cernuum[a] (nodding buckwheat) | Erodium cicutarium[ai] (redstem stork's bill) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Mentzelia multiflora[a] (Adonis blazingstar) | Oenothera (evening primrose) | Orobanche fasciculata (clustered broomrape) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Sanguisorba minori (small burnet) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 3 | - | 7 | 167 | - | - | - | - | - | 11 | - | - | - | 2 | 5 | - | - |
| 2000 | - | - | - | 19 | - | - | - | - | - | 9 | - | - | - | - | - | - | - |
| 2005 | - | - | 36 | 215 | - | - | - | 2 | - | 10 | - | - | - | - | 6 | 2 | - |
| 2010 | - | - | 13 | 81 | - | - | - | - | - | 7 | - | - | - | - | - | - | - |
| 2015 | 12 | 1 | 23 | - | 92 | - | 5 | 3 | - | 10 | 3 | 13 | 11 | 3 | 8 | - | - |
| 2020 | 8 | - | 2 | 26 | 6 | 3 | - | - | - | 30 | 2 | - | 13 | - | - | - | 1 |
| 2025 | - | - | 3 | - | - | - | - | - | 2 | 6 | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.0 | 0.5 | - | - | - | - | - | 0.0 | - | - | - | 0.0 | 0.0 | - | - |
| 2000 | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| 2005 | - | - | 0.2 | 8.6 | - | - | - | 0.0 | - | 0.0 | - | - | - | - | 0.0 | 0.0 | - |
| 2010 | - | - | 0.0 | 0.2 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| 2015 | 0.0 | 0.0 | 0.2 | - | 3.6 | - | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | - | - |
| 2020 | 0.1 | - | 0.0 | 0.5 | 0.1 | 0.0 | - | - | - | 0.2 | 0.0 | - | 0.6 | - | - | - | 0.0 |
| 2025 | - | - | 0.0 | - | - | - | - | - | 0.0 | 0.1 | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-15.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Ephedra viridis[p] (mormon tea) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2005 | 7.3 | - | - | - | 20.6 | 0.1 | - |
| 2010 | 1.4 | - | - | 0.2 | 29.4 | - | - |
| 2015 | 1.6 | - | - | 2.4 | 0.4 | - | 0.1 |
| 2020 | 4.3 | 0.2 | - | 1.3 | 0.1 | 0.1 | 0.3 |
| 2025 | 4.2 | 2 | - | 2.4 | 1.5 | - | 0.6 |
| year | Quadrat Cover (%) | | | | | | |
| 1995 | 5.2 | - | 0.0 | 0.4 | 11.8 | - | 0.1 |
| 2000 | 6.0 | - | 0.0 | 0.4 | 13.1 | - | 0.0 |
| 2005 | 2.0 | - | 0.1 | 0.5 | 12.8 | 0.0 | - |
| 2010 | 1.5 | - | 0.2 | 0.3 | 18.6 | - | - |
| 2015 | 1.8 | 0.0 | - | 2.6 | 0.5 | - | 0.1 |
| 2020 | 5.4 | 0.6 | 0.3 | 0.7 | 0.9 | 0.0 | 0.0 |
| 2025 | 3.1 | 1.6 | 0.0 | 2.2 | 1.2 | - | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-15.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 1680 | 540 | 7 | 51 | 42 | 43 | 24 | 19 | 52/84 |
| 2000 | 1960 | 40 | 34 | 21 | 45 | 48 | 7 | 29 | 46/72 |
| 2005 | 920 | - | 2 | 2 | 96 | 22 | 70 | 89 | 33/46 |
| 2010 | 800 | - | 5 | 60 | 35 | 35 | 18 | 3 | 34/61 |
| 2015 | 620 | 40 | 10 | 71 | 19 | 68 | 13 | 29 | 33/64 |
| 2020 | 780 | - | 10 | 69 | 21 | 28 | 3 | 5 | 45/71 |
| 2025 | 620 | - | 7 | 84 | 10 | 10 | 52 | 10 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 100 | - | 80 | 20 | 0 | 40 | 40 | 20 | 11/12 |
| 2020 | 160 | - | 13 | 88 | 0 | 50 | 25 | 25 | 78/79 |
| 2025 | 260 | - | 8 | 69 | 23 | 69 | 23 | 31 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 18/33 |
| 2010 | - | - | - | - | - | - | - | - | 16/18 |
| 2015 | - | - | - | - | - | - | - | - | 17/27 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Echinocactus -- (echinocactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 8/8 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 100 | 100 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[p] -- (mormon tea) | | | | | | | | | |
| 1995 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 36/37 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 50 | 50 | 24/22 |
| 2005 | 60 | - | 0 | 67 | 33 | 0 | 33 | 33 | 43/43 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/30 |
| 2015 | 60 | - | 100 | 0 | 0 | 0 | 0 | 33 | 31/22 |
| 2020 | 80 | 160 | 0 | 100 | 0 | 100 | 0 | 50 | 36/44 |
| 2025 | 160 | - | 0 | 75 | 25 | 0 | 25 | 25 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 42/53 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1160 | 20 | 26 | 74 | 0 | 0 | 0 | 0 | 21/21 |
| 2000 | 860 | - | 14 | 58 | 28 | 0 | 0 | 7 | 16/24 |
| 2005 | 200 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 24/27 |
| 2010 | 940 | - | 4 | 96 | 0 | 0 | 0 | 0 | 12/15 |
| 2015 | 6560 | 220 | 41 | 59 | 0 | 4 | 0 | 5 | 23/29 |
| 2020 | 3160 | 220 | 54 | 44 | 3 | 0 | 0 | 1 | 13/17 |
| 2025 | 4580 | 20 | 25 | 76 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 260 | 20 | 8 | 92 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 340 | - | 41 | 59 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 240 | 20 | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 100 | 100 | 80 | 0 | 20 | 0 | 0 | 60 | - / - |
| 2020 | 100 | 180 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 220 | 20 | 82 | 18 | 0 | 9 | 9 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 140 | 60 | 0 | 100 | 0 | 0 | 0 | 0 | 10/16 |
| 2010 | - | - | - | - | - | - | - | - | 10/14 |
| 2015 | - | - | - | - | - | - | - | - | 8/13 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 23/41 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/31 |
| 2000 | 40 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | 12/35 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/52 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 50 | 11/29 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/38 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/55 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

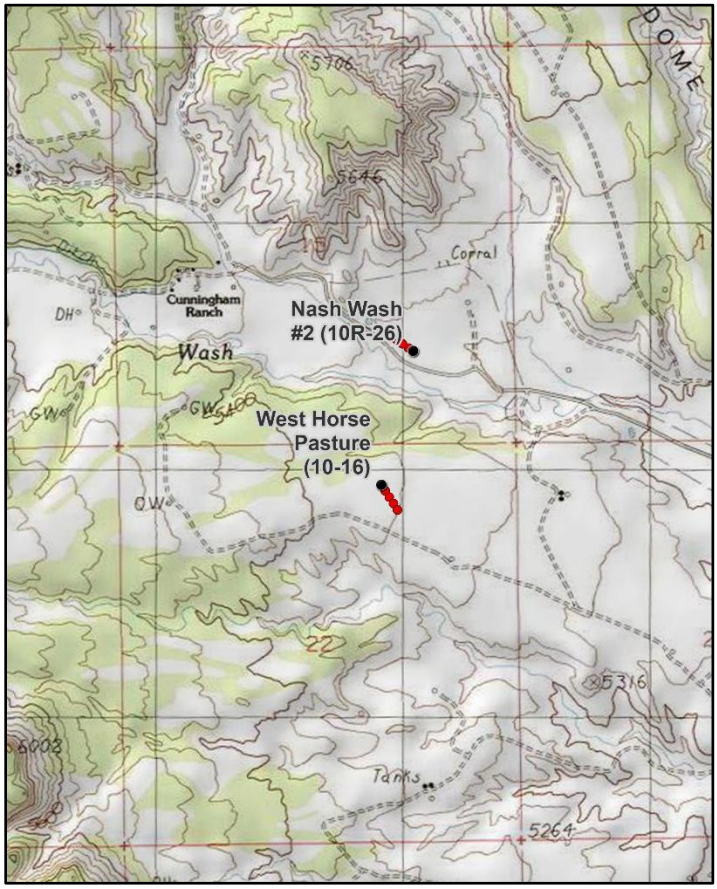
**Table 10-15.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

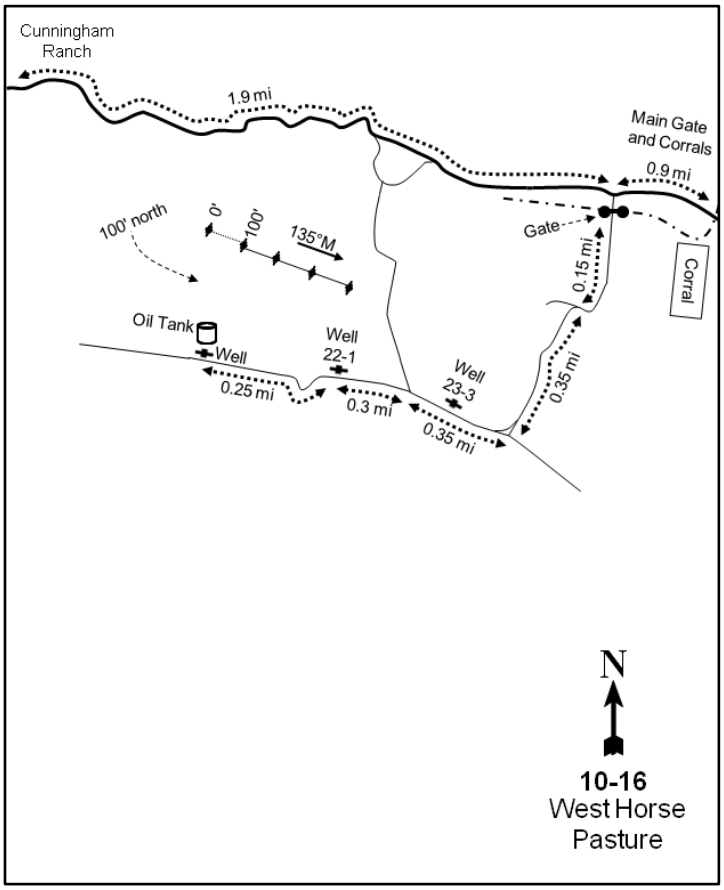
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 108 | - | - | - | - | - | 10.6 |
| 2000 | 101 | - | - | - | - | - | 7.8 |
| 2005 | 144 | - | 21 | 21 | 32 | 26 | 10.1 |
| 2010 | 182 | 10 | 20 | 20 | 45 | 5 | 8.8 |
| 2015 | 51 | 53 | 35 | 12 | - | - | 3.4 |
| 2020 | 39 | 21 | 71 | 7 | - | - | 5.3 |
| 2025 | 105 | 55 | 35 | 10 | - | - | 2.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 6 | - | - | - | - | - | 11.5 |
| 2010 | 5 | - | - | - | - | 100 | 14.5 |
| 2015 | 1 | - | 100 | - | - | - | 2.0 |
| 2020 | 1 | - | 100 | - | - | - | 3.0 |

**Table 10-15.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 6.5 | 2.5 | 3.6 | 4.5 | -1.4 | 1.0 | 0.0 | **16.7** | Poor |
| 2000 | 7.5 | 1.5 | 15.0 | 6.1 | -0.1 | 0.6 | 0.0 | **30.6** | Fair |
| 2005 | 9.1 | -7.8 | 1.1 | 9.2 | -0.6 | 2.3 | 0.0 | **13.3** | Poor |
| 2010 | 1.8 | 0.0 | 0.0 | 6.4 | -0.1 | 1.6 | 0.0 | **9.7** | Very Poor-Poor |
| 2015 | 2.0 | 0.0 | 0.0 | 10.6 | -0.9 | 8.3 | 0.0 | **20.0** | Poor |
| 2020 | 5.6 | 0.0 | 0.0 | 29.3 | -1.2 | 4.9 | 0.0 | **38.6** | Fair |
| 2025 | 7.8 | 10.8 | 3.4 | 28.7 | -1.8 | 2.0 | 0.0 | **50.9** | Good |

# WEST HORSE PASTURE - STUDY NO. 10-16




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Calf Canyon SW; Township 20S, Range 21E, Section 22 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 622851 East 4324139 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7807 |
| Transect Bearing | 135° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (28ft) |
| Belt Marker Placement | Belt 4: No Rebar |

## Directions to Site

From the main gate at Cunningham Ranch, travel south for 1.9 miles to a fork and turn right. Go through a gate (100 yards) and proceed 0.15 miles to a fork at the top of a hill. Stay left and go 0.35 miles to a "T" intersection. Turn right and go 0.35 miles past an oil well (NP Energy #233) to a fork. Stay left and travel northwest 0.3 miles to another well (NP Energy #221). Continue northwest for 0.25 miles to another well and oil-tank. The 0-foot stake is 100 feet north of the oil-tank and is marked by a rebar tagged with browse tag #7807.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | CISCO |
| Elevation | 5,300ft (1,615m) |
| Aspect | Southeast |
| Slope | 0-3% |
| Sample Dates | 06/09/1995, 05/31/2000, 05/31/2005, 06/01/2010, 05/26/2015, 05/26/2020, 05/27/2025 |

**Table 10-16.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial | Moab Cheat grass control and seeding (Proposed) | 7359 | Fall 2025 | 9029 |
| Seeding - Rangeland Drill | Nash Wash WMA Wildfire Rehab | 2480/2258 | October-November 2012 | 81 |
| Fire - Wildfire | Nash Wash | - | June 2010 | 22 |
| Herbicide - Plateau | Nash Wash WMA Wildfire Rehab | 2480/2258 | October-November 2012 | 115 |
| Fire - Wildfire | 22-2 | - | 2009 | 4 |

**Table 10-16.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Nash Wash WMA Phase II | | | Drill | Oct 2012 | 60 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Emery UT | 1.67 | 1.27 |
| G | Elymus elymoides | Bottlebrush Squirreltail | Fish Creek | 0.50 | 0.38 |
| G | Hesperostipa comata | Needle and Threadgrass | Duchesne UT | 0.25 | 0.18 |
| G | Leymus cinereus | Great Basin Wildrye | Trailhead | 1.00 | 0.92 |
| G | Psathyrostachys juncea | Russian Wildrye | | 1.00 | 0.75 |
| G | Sporobolus cryptandrus | Sand Dropseed | | 0.10 | 0.09 |
| F | Cleome serrulata | Rocky Mountain Beeplant | Sanpete UT | 0.50 | 0.47 |
| F | Linum perenne | Blue Flax | Appar | 0.33 | 0.30 |
| F | Linum perenne | Blue Flax | Appar | 0.67 | 0.58 |
| F | Medicago sativa | Alfalfa | Spredor 4 | 1.67 | 1.47 |
| F | Medicago sativa | Alfalfa | Nomad | 0.38 | 0.34 |
| F | Onobrychis viciifolia | Sainfoin | Eski | 1.00 | 0.84 |
| F | Sphaeralcea grossulariifolia | Gooseberryleaf Globemallow | Sanpete UT | 0.25 | 0.23 |
| S | Atriplex canescens | Fourwing Saltbush | Duchesne UT | 1.00 | 0.60 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Nash Wash WMA Phase II - Fluffy Box mix | | | Drill | Oct 2012 | 60 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Sevier UT | 1.00 | 0.21 |
| S | Bassia prostrata | Forage Kochia | Beaver UT | 0.50 | 0.31 |

## Wildlife Habitat and Vegetation History

**Table 10-16.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Pronghorn | crucial | year-long |

**Table 10-16.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush | Early Phase I |
| 1995 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Annual Grass/Wyoming Big Sagebrush | Early Phase I |
| 2010 | Annual Grass | Early Phase I |
| 2015 | Annual Grass/Broom Snakeweed | Early Phase I |
| 2020 | Annual Grass | Early Phase I |
| 2025 | Annual Forb-Grass | Early Phase I |

### Site Notes

The study transect had to be moved slightly in 2010 due to an oil pad that was placed directly over the old transect.

## Soils

**Table 10-16.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.4 | 50.0 | 24.0 | 26.0 | 0.7 | 3.8 | 57.6 | 0.5 | 05/31/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1986-2005 - Current Potential State: Community Phase 2.4<br>2010-2025 - Invasive Annual State: Community Phase 4.1 |

From study establishment in 1986 through the 2005 sample year, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) dominated the shrub component of this site (Pre-1992 Data). Other shrubs were present, but they generally provided little cover. Sagebrush decreased substantially following fires in 2009 and 2010 (Table 10-16.1). Broom snakeweed (*Gutierrezia sarothrae*) has been the most abundant shrub following the burns and was a dominant vegetation component in 2015 (Photos, Table 10-16.12, Table 10-16.13). The introduced annual grass species cheatgrass (*Bromus tectorum*) has been present in varying amounts throughout the duration of the study. Despite herbicide and seeding treatments in 2012 (Table 10-16.1), cheatgrass has persisted and has been a dominant or co-dominant vegetation component in most sample years (Table 10-16.7, Table 10-16.10). Furthermore, cover of the weedy annual forb species prickly Russian thistle (*Salsola tragus*) increased substantially in 2025; annual forbs were co-dominant with cheatgrass during the most recent sample year (Table 10-16.11).

Condition of mule deer winter range on this site has ranged between very poor and fair since 1995; winter range condition was considered to be very poor in 2025. Negative factors contributing to this condition include a lack of cover and decadence within the preferred browse community; reduced perennial grass cover; elevated annual grass cover; and a lack of perennial forb cover (Table 10-16.6, Table 10-16.7, Table 10-16.13, Table 10-16.15). Pellet transect data indicates that deer presence was moderate in 2005, 2015, and 2020, but presence has been high in all other sample years since 2000. During the 2024/25 winter season the area had common occurrences of collared mule deer (Wildlife Migration Initiative). Over 80% of sagebrush plants have shown signs of moderate to heavy use for most years sampled (the exception being 2010). Sagebrush decadence has been elevated over the same period. As such, it is reasonable to assume that sustained moderate-heavy utilization by deer in combination with other factors (climatic, etc.) has contributed to this increasing decadence within the sagebrush population. Elk were present in low amounts between 2000 and 2010, but pellet groups have not been observed in any other sample year (Table 10-16.9, Table 10-16.13). On-site observations for 2025 noted that little utilization was evident on herbaceous species.

## Trend Summary Tables

**Table 10-16.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 12.3 | 7.6 | - | - | - | - |
| 2000 | 15.1 | 0.3 | - | - | - | - |
| 2005 | 8.0 | 4.4 | - | 7.7 | 4.5 | - |
| 2010 | 3.8 | 3.9 | - | 4.7 | 4.8 | - |
| 2015 | 0.8 | 12.4 | - | 1.2 | 7.7 | - |
| 2020 | 1.8 | 2.2 | - | 2.6 | 1.8 | - |
| 2025 | 2.1 | 2.6 | - | 3.2 | 3.4 | - |

**Table 10-16.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 464 | 91 | 217 | 88 | 12.1 | 1.8 | 0.6 | 0.6 |
| 2000 | 216 | 124 | 2 | 89 | 1.4 | 5.7 | 0.0 | 1.9 |
| 2005 | 477 | 66 | 281 | 72 | 51.5 | 2.1 | 5.2 | 1.7 |
| 2010 | 405 | 38 | 127 | 162 | 18.6 | 2.1 | 1.4 | 4.3 |
| 2015 | 428 | 173 | 311 | 117 | 11.8 | 7.1 | 3.3 | 1.4 |
| 2020 | 483 | 141 | 247 | 110 | 45.4 | 7.7 | 4.5 | 2.3 |
| 2025 | 302 | 82 | 414 | 68 | 9.5 | 3.5 | 11.9 | 0.7 |

**Table 10-16.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 29.6 | 1.9 | 45.2 | - | 0.1 | 36.1 |
| 2000 | 50.7 | 3.0 | 32.8 | 0.1 | 0.0 | 27.0 |
| 2005 | 20.2 | 0.6 | 18.6 | 0.0 | 0.0 | 68.0 |
| 2010 | 38.8 | 0.3 | 40.4 | 0.0 | 0.0 | 35.8 |
| 2015 | 39.7 | 0.1 | 36.5 | 0.0 | 0.0 | 42.1 |
| 2020 | 13.5 | 0.1 | 43.1 | 0.1 | 0.0 | 62.0 |
| 2025 | 51.6 | 0.1 | 35.7 | 0.1 | 0.5 | 26.6 |

**Table 10-16.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 44 | - | 49 |
| 2000 | - | 66 | 3 | 30 |
| 2005 | - | 24 | 1 | 16 |
| 2010 | - | 33 | 6 | 6 |
| 2015 | 1 | 36 | - | 16 |
| 2020 | - | 32 | 2 | 11 |
| 2025 | 3 | 55 | - | 39 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 58.3 (144.0) | 5.3 (13.2) | - |
| 2005 | 1.5 (3.6) | 38.9 (96.0) | 8.7 (21.5) | - |
| 2010 | - | 141.4 (349.3) | 2.7 (6.6) | - |
| 2015 | - | 38.2 (94.4) | - | - |
| 2020 | - | 44.2 (109.2) | - | - |
| 2025 | - | 113.9 (281.4) | - | - |

**Table 10-16.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Eremopyrum triticeum[ai] (annual wheatgrass) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 3 | 464 | 44 | - | - | 54 | - | - | - | 13 |
| 2000 | 5 | 216 | 65 | - | - | 56 | - | - | 2 | - |
| 2005 | 6 | 476 | 15 | - | - | 48 | - | - | - | 74 |
| 2010 | 3 | 405 | 9 | - | 2 | 18 | - | - | 6 | 3 |
| 2015 | 17 | 428 | 9 | - | 19 | 108 | - | - | 38 | 10 |
| 2020 | 40 | 481 | 8 | - | 17 | 44 | - | 2 | 40 | 36 |
| 2025 | 15 | 287 | - | 1 | 12 | 43 | 3 | - | 9 | 68 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.1 | 12.0 | 0.4 | - | - | 1.2 | - | - | - | 0.0 |
| 2000 | 0.4 | 1.4 | 1.6 | - | - | 3.7 | - | - | 0.0 | - |
| 2005 | 0.8 | 50.8 | 0.4 | - | - | 0.9 | - | - | - | 0.8 |
| 2010 | 0.2 | 18.6 | 0.5 | - | 0.3 | 0.9 | - | - | 0.2 | 0.0 |
| 2015 | 1.6 | 11.8 | 0.2 | - | 0.8 | 3.3 | - | - | 1.3 | 0.0 |
| 2020 | 4.5 | 45.2 | 0.2 | - | 0.6 | 1.0 | - | 0.0 | 1.4 | 0.2 |
| 2025 | 1.4 | 9.1 | - | 0.0 | 0.1 | 1.5 | 0.0 | - | 0.6 | 0.4 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-16.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella hutchinsifolia[a] (desert pale gilia) | Alyssum desertorum[ai] (desert madwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chaetopappa ericoides (rose heath) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Gilia inconspicua[a] (shy gilia) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Malcolmia africana[ai] (African mustard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 8 | - | 29 | 12 | 3 | 6 | 1 | - | 12 | 1 | - | - | - | - | 34 | 47 | - |
| 2000 | - | - | 3 | 7 | 1 | 3 | 3 | - | - | - | 5 | - | - | - | - | - | - |
| 2005 | 37 | - | 5 | 10 | 20 | - | 4 | 2 | 16 | 1 | - | - | - | - | 67 | 28 | - |
| 2010 | 20 | - | 0 | 12 | 1 | 3 | 9 | - | 2 | - | - | 2 | - | 12 | 85 | 17 | - |
| 2015 | - | - | 1 | 4 | - | - | 3 | - | 12 | - | 1 | 26 | - | - | 50 | 16 | - |
| 2020 | - | 108 | 6 | 6 | 2 | - | 4 | - | - | - | 2 | 59 | 35 | - | 7 | 18 | 2 |
| 2025 | 3 | 12 | 3 | - | - | - | 5 | 3 | - | - | - | 17 | 4 | - | 24 | 7 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.1 | 0.2 | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.0 | - | - | - | - | 0.1 | 0.1 | - |
| 2000 | - | - | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | - | - | - | 0.0 | - | - | - | - | - | - |
| 2005 | 0.2 | - | 0.0 | 0.5 | 0.1 | - | 0.0 | 0.0 | 0.1 | 0.0 | - | - | - | - | 0.3 | 0.6 | - |
| 2010 | 0.1 | - | 0.0 | 0.1 | 0.0 | 0.1 | 0.5 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.3 | 0.6 | - |
| 2015 | - | - | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | - | 0.0 | 0.1 | - | - | 0.1 | 0.0 | - |
| 2020 | - | 1.5 | 0.0 | 0.1 | 0.0 | - | 0.4 | - | - | - | 0.0 | 2.0 | 0.1 | - | 0.0 | 0.0 | 0.0 |
| 2025 | 0.0 | 0.0 | 0.0 | - | - | - | 0.1 | 0.0 | - | - | - | 0.1 | 0.0 | - | 0.1 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Oenothera (evening primrose) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Senecio integerrimus[a] (lambstongue ragwort) | Silene antirrhina[a] (sleepy silene) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia (Townsend daisy) | Trifolium (clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 5 | 21 | 149 | - | - | - | 21 | - | 30 | - | - |
| 2000 | - | 22 | 2 | - | 1 | - | - | - | 49 | - | - |
| 2005 | - | - | 212 | - | - | - | - | - | 40 | 3 | - |
| 2010 | 8 | 1 | 7 | 11 | - | - | - | - | 131 | - | - |
| 2015 | - | - | 237 | 86 | 1 | 3 | - | 2 | 111 | - | 2 |
| 2020 | - | 3 | 127 | 3 | - | - | - | 2 | 97 | - | - |
| 2025 | - | 1 | 104 | 394 | 2 | - | - | 7 | 59 | - | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.3 | - | - | - | 0.1 | - | 0.2 | - | - |
| 2000 | - | 0.0 | 0.0 | - | 0.0 | - | - | - | 1.6 | - | - |
| 2005 | - | - | 3.9 | - | - | - | - | - | 1.1 | 0.0 | - |
| 2010 | 0.0 | 0.0 | 0.0 | 0.3 | - | - | - | - | 3.5 | - | - |
| 2015 | - | - | 1.7 | 1.3 | 0.0 | 0.0 | - | 0.0 | 1.3 | - | 0.0 |
| 2020 | - | 0.0 | 0.8 | 0.0 | - | - | - | 0.0 | 1.8 | - | - |
| 2025 | - | 0.0 | 0.4 | 11.2 | 0.0 | - | - | 0.0 | 0.5 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-16.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Bassia prostrata[pi] (forage kochia) | Ericameria nauseosa (rubber rabbitbrush) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2005 | 7.7 | - | - | - | - | 4 | 0.5 |
| 2010 | 4.7 | - | - | - | - | 4.6 | 0.2 |
| 2015 | 0.8 | - | 0.4 | - | - | 7.7 | - |
| 2020 | 0.9 | - | 1.7 | - | - | 1.8 | - |
| 2025 | 0.5 | - | 2.7 | - | - | 3.4 | - |
| year | Quadrat Cover (%) | | | | | | |
| 1995 | 12.3 | - | - | - | - | 7.6 | 0.0 |
| 2000 | 15.1 | - | - | - | - | 0.2 | 0.1 |
| 2005 | 8.0 | - | - | - | - | 3.8 | 0.6 |
| 2010 | 3.6 | - | - | 0.0 | 0.1 | 3.5 | 0.4 |
| 2015 | 0.7 | 0.0 | 0.1 | - | - | 12.3 | 0.2 |
| 2020 | 0.9 | 0.0 | 0.9 | - | - | 2.2 | 0.0 |
| 2025 | 0.1 | - | 1.7 | - | 0.3 | 2.6 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-16.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 4300 | - | 2 | 71 | 27 | 43 | 50 | 16 | 43/75 |
| 2000 | 3500 | - | 1 | 74 | 26 | 58 | 23 | 21 | 41/69 |
| 2005 | 3140 | 180 | 1 | 27 | 71 | 27 | 70 | 51 | 47/71 |
| 2010 | 1560 | 300 | 6 | 49 | 45 | 55 | 8 | 27 | 35/66 |
| 2015 | 500 | - | 20 | 36 | 44 | 12 | 68 | 56 | 29/55 |
| 2020 | 180 | - | 0 | 0 | 100 | 0 | 100 | 100 | 31/54 |
| 2025 | 220 | - | 0 | 55 | 46 | 0 | 100 | 46 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/47 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Bassia prostrata[pi] -- (forage kochia) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 360 | 540 | 6 | 94 | 0 | 61 | 0 | 0 | 20/31 |
| 2020 | 1160 | - | 17 | 81 | 2 | 33 | 22 | 7 | 24/43 |
| 2025 | 1300 | 40 | 0 | 100 | 0 | 22 | 0 | 0 | - / - |
| Echinocactus -- (echinocactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/34 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | 40 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | - | 50 | 50 | 0 | 50 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | 18/15 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 25/52 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 50/68 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 42/74 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 100 | 49/59 |
| 2020 | 400 | 120 | 70 | 10 | 20 | 0 | 0 | 20 | 48/76 |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 15140 | 580 | 35 | 65 | 0 | 0 | 0 | 0 | 31/33 |
| 2000 | 1020 | 40 | 2 | 80 | 18 | 0 | 0 | 12 | 24/27 |
| 2005 | 4460 | 180 | 1 | 97 | 2 | 0 | 0 | 0 | 34/34 |
| 2010 | 2300 | - | 3 | 90 | 8 | 0 | 0 | 1 | 28/43 |
| 2015 | 10780 | 860 | 18 | 79 | 3 | 14 | 11 | 3 | 23/32 |
| 2020 | 21080 | 840 | 30 | 69 | 1 | 0 | 0 | 2 | 12/13 |
| 2025 | 2420 | 20 | 4 | 89 | 7 | 0 | 0 | 8 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 39/34 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/48 |
| 2000 | 240 | 20 | 0 | 75 | 25 | 8 | 0 | 17 | 14/45 |
| 2005 | 360 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/60 |
| 2010 | 280 | - | 0 | 71 | 29 | 0 | 0 | 14 | 13/44 |
| 2015 | 60 | - | 33 | 67 | 0 | 33 | 0 | 33 | 15/56 |
| 2020 | 60 | - | 0 | 67 | 33 | 0 | 0 | 33 | 13/44 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

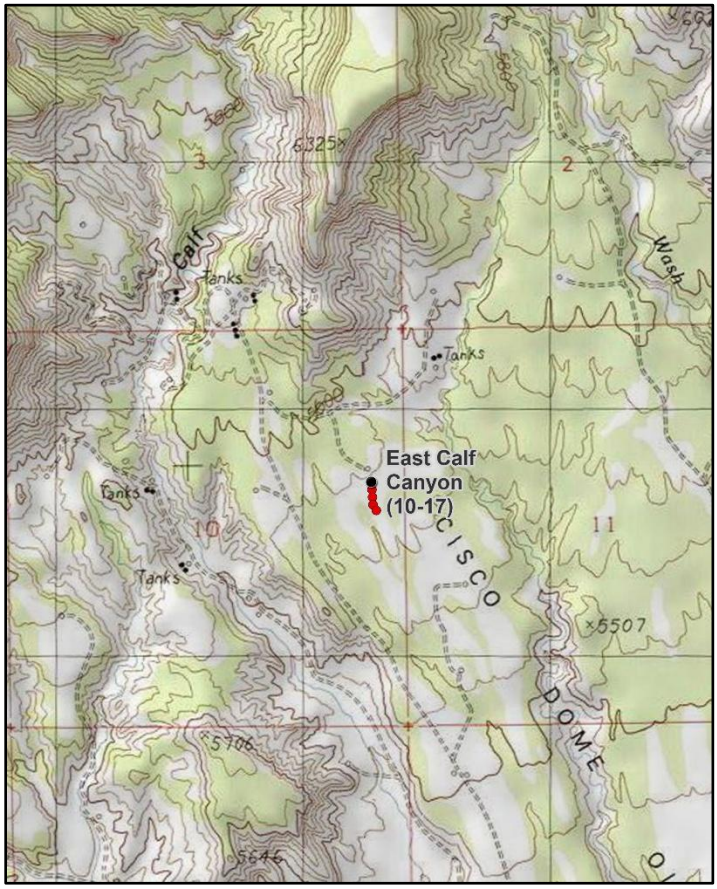
**Table 10-16.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

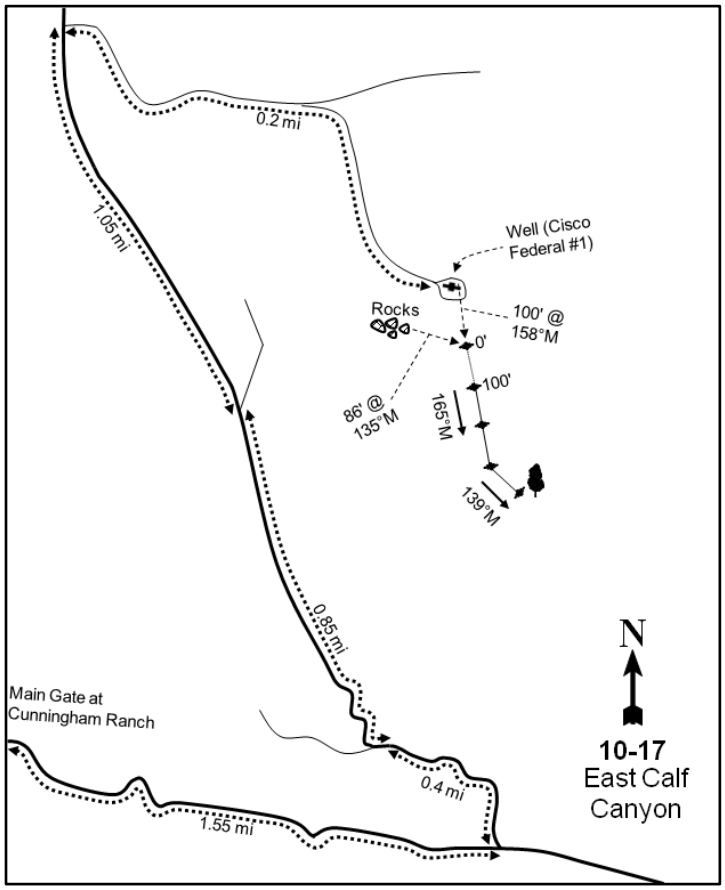
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 38 | - | - | - | - | - | 10.8 |
| 2020 | 2 | - | 67 | 33 | - | - | 10.3 |
| 2025 | 1 | - | 50 | 50 | - | - | 27.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 7 | - | - | - | - | - | 34.0 |

**Table 10-16.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 15.3 | 7.0 | 1.1 | 3.7 | -9.0 | 1.2 | 0.0 | **19.3** | Poor |
| 2000 | 18.8 | 7.3 | 0.3 | 11.5 | -1.1 | 3.8 | 0.0 | **40.6** | Fair |
| 2005 | 9.6 | 0.1 | 0.7 | 4.3 | -20.0 | 3.5 | 0.0 | **-1.8** | Very Poor |
| 2010 | 5.9 | 0.0 | 0.0 | 4.1 | -14.0 | 8.5 | 0.0 | **4.5** | Very Poor |
| 2015 | 1.6 | 0.0 | 0.0 | 14.3 | -8.9 | 2.9 | 0.0 | **9.9** | Very Poor-Poor |
| 2020 | 3.7 | 0.0 | 0.0 | 15.4 | -20.0 | 4.5 | 0.0 | **3.6** | Very Poor |
| 2025 | 4.7 | 0.0 | 0.0 | 7.1 | -7.1 | 1.3 | 0.0 | **6.0** | Very Poor |

# EAST CALF CANYON - STUDY NO. 10-17




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Calf Canyon NW; Township 20S, Range 21E, Section 10 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 623214 East 4326909 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7847 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 4: No Rebar |

## Directions to Site

From the main gate at Cunningham Ranch, travel southeast on the main road for 1.6 miles to a fork and turn left (northeast). Proceed 0.4 miles to a fork, then turn right and proceed 0.9 miles to another fork. Stay left and travel 1.1 miles to another fork. Turn right and go 0.2 miles (while staying right), continuing to a well that is numbered "Cisco Federal #1." The first baseline stake is approximately 100 feet southeast of the road in the sagebrush opening.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | CISCO |
| Elevation | 5,500ft (1,676m) |
| Aspect | Southeast |
| Slope | 3% |
| Sample Dates | 06/14/1995, 06/01/2000, 05/31/2005, 06/01/2010, 05/26/2015, 05/26/2020, 06/04/2025 |

**Table 10-17.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial | Moab Cheat grass control and seeding (Proposed) | 7359 | Fall 2025 | 9029 |
| Lop and Scatter - Hand Crew | - | - | January 2023-Winter 2024 | - |
| Herbicide - Plateau | Moab Field Office Cheatgrass Control | 5573 | November 2023 | 11016 |

## Wildlife Habitat and Vegetation History

**Table 10-17.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Pronghorn | crucial | year-long |

**Table 10-17.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 1995 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush | Early Phase I |
| 2010 | Wyoming Big Sagebrush | Phase I |
| 2015 | Wyoming Big Sagebrush | Phase I |
| 2020 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2025 | Wyoming Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-17.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.2 | 44.0 | 29.4 | 26.6 | 0.8 | 6.5 | 67.2 | 0.5 | 06/01/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1986-2020 - Juniper Encroachment State: Community Phase 3.1<br>2025 - Current Potential State: Community Phase 2.1 |

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has been the dominant shrub species on this site since study establishment in 1986 (Photos, Pre-1992 Data, Table 10-17.12, Table 10-17.13). The introduced annual grass species cheatgrass (*Bromus tectorum*) has contributed most of the herbaceous cover in many sample years and was a co-dominant vegetation component in 1986, 1995, and 2020. Herbaceous species other than cheatgrass have generally remained rare (Table 10-17.7, Table 10-17.10, Table 10-17.11). Utah juniper (*Juniperus osteosperma*) has been observed in all sample years; density is low as of 2025 due to a 2023-2024 lop and scatter treatment (Photos, Table 10-17.1, Table 10-17.12, Table 10-17.13, Table 10-17.14). There may be potential for infilling in future sample years. However, the site has been considered to be within Early Phase I of woodland succession since 2020 (Table 10-17.4), indicating that infilling may not be an immediate concern.

Condition of mule deer winter range on this site has ranged between fair and good since 1995; winter range condition was considered to be fair in 2025. Negative factors contributing to this condition include reduced preferred browse cover; an elevated amount of preferred browse decadence; reduced perennial grass cover; the amount of annual grass cover; and a lack of perennial forb cover (Table 10-17.6, Table 10-17.7, Table 10-17.13, Table 10-17.15). Pellet transect data indicates that deer presence was moderate in 2000 and 2020, but has been high in all other sample years since 2005. During the 2024/25 winter season the study site had scattered occurrences of collared mule deer; the site appears to be on the edge of concentrated collared mule deer occurrences (Wildlife Migration Initiative). Over 90% of sagebrush plants sampled in density strips displayed signs of moderate to heavy use in 2015 and 2025, and decadence increased over the same period. As such, it is reasonable to assume that sustained moderate-heavy utilization by deer in combination with other factors (climatic, etc.) has contributed to this increasing decadence within the sagebrush population. Elk were present in low amounts between 2005 and 2020, but pellet groups have not been observed in any other sample year (Table 10-17.9, Table 10-17.13). On-site observations for 2025 note that little utilization was evident on herbaceous species.

## Trend Summary Tables

**Table 10-17.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 17.4 | 1.3 | 1.9 | - | - | - |
| 2000 | 19.8 | 0.4 | 0.0 | - | - | - |
| 2005 | 17.6 | 2.3 | 1.6 | 23.0 | 4.0 | 3.6 |
| 2010 | 19.5 | 2.5 | 1.1 | 21.1 | 1.4 | 4.0 |
| 2015 | 19.2 | 1.4 | 1.3 | 18.5 | 1.4 | 4.0 |
| 2020 | 19.8 | 0.9 | 0.7 | 18.0 | 1.1 | 1.2 |
| 2025 | 12.2 | 1.8 | - | 12.8 | 2.0 | 3.0 |

**Table 10-17.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 443 | 105 | 69 | 88 | 16.8 | 0.7 | 0.2 | 0.7 |
| 2000 | 111 | 64 | 33 | 58 | 1.0 | 0.4 | 0.1 | 0.4 |
| 2005 | 193 | 41 | 311 | 49 | 1.8 | 0.9 | 6.6 | 1.8 |
| 2010 | 137 | 61 | 217 | 84 | 0.7 | 1.7 | 1.2 | 1.1 |
| 2015 | 337 | 76 | 133 | 47 | 4.2 | 1.2 | 0.4 | 0.1 |
| 2020 | 434 | 45 | 106 | 47 | 18.2 | 1.7 | 0.5 | 0.7 |
| 2025 | 86 | 42 | 13 | 28 | 0.6 | 1.0 | 0.0 | 0.1 |

**Table 10-17.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 29.2 | 7.5 | 38.3 | 0.2 | 0.3 | 37.4 |
| 2000 | 47.6 | 9.7 | 33.6 | 0.4 | 0.7 | 23.1 |
| 2005 | 47.5 | 8.8 | 22.6 | 0.3 | 0.5 | 30.7 |
| 2010 | 44.7 | 6.9 | 30.0 | 0.3 | 0.5 | 26.5 |
| 2015 | 51.4 | 8.3 | 29.8 | 0.3 | 0.2 | 26.7 |
| 2020 | 37.5 | 9.8 | 42.6 | 0.4 | 0.4 | 36.4 |
| 2025 | 44.0 | 11.1 | 42.5 | 0.7 | 0.4 | 16.8 |

**Table 10-17.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit | Domestic Sheep |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 21 | - | 16 | 9 |
| 2000 | - | 30 | - | 19 | - |
| 2005 | - | 50 | 1 | 42 | - |
| 2010 | - | 34 | 19 | 13 | - |
| 2015 | - | 62 | 6 | 11 | - |
| 2020 | - | 37 | - | 16 | - |
| 2025 | - | 73 | 2 | 16 | - |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | 28.8 (71.2) | - | - | - |
| 2005 | 0.7 (1.8) | 69.0 (170.5) | 14.1 (34.8) | - | - |
| 2010 | - | 73.0 (180.4) | 14.1 (34.8) | - | - |
| 2015 | - | 104.5 (258.2) | 5.3 (13.2) | - | - |
| 2020 | - | 37.5 (92.7) | 0.7 (1.7) | - | - |
| 2025 | - | 183.6 (453.5) | - | - | - |

**Table 10-17.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum thurberianum (Thurber's needlegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Poa fendleriana (muttongrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | - | 443 | 104 | 4 | 44 |
| 2000 | - | 111 | 63 | 1 | 1 |
| 2005 | - | 125 | 41 | - | 98 |
| 2010 | - | 137 | 61 | - | 4 |
| 2015 | 1 | 334 | 74 | 1 | 33 |
| 2020 | 12 | 434 | 31 | 2 | 33 |
| 2025 | - | 80 | 42 | - | 11 |
| year | Average Cover (%) | | | | |
| 1995 | - | 16.8 | 0.7 | 0.0 | 0.1 |
| 2000 | - | 1.0 | 0.4 | 0.0 | 0.0 |
| 2005 | - | 1.0 | 0.9 | - | 0.8 |
| 2010 | - | 0.7 | 1.7 | - | 0.0 |
| 2015 | 0.0 | 4.1 | 1.2 | 0.0 | 0.1 |
| 2020 | 0.3 | 18.1 | 1.4 | 0.0 | 0.1 |
| 2025 | - | 0.5 | 1.0 | - | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-17.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella hutchinsifolia[a] (desert pale gilia) | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Astragalus (milkvetch) | Astragalus flexuosus (flexile milkvetch) | Calochortus nuttallii (sego lily) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis stevioides[a] (Esteve's pincushion) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Delphinium (larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Erigeron utahensis (Utah fleabane) | Eriogonum (buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 18 | - | - | 8 | 0 | - | 6 | - | - | - | 4 | - | 9 | 19 | - | 8 | 2 |
| 2000 | - | - | - | 1 | 6 | - | 3 | - | - | - | - | - | - | 2 | 1 | - | - |
| 2005 | 223 | - | - | 12 | 0 | 5 | 2 | - | 3 | 10 | - | - | 95 | 61 | 3 | - | - |
| 2010 | 66 | - | 5 | - | 5 | 22 | 1 | - | - | 72 | - | 2 | - | 9 | 1 | - | - |
| 2015 | 3 | - | - | - | 4 | - | - | - | - | - | - | - | - | 3 | 2 | - | - |
| 2020 | - | 26 | - | 1 | 3 | - | - | 1 | - | - | - | - | - | - | 10 | - | - |
| 2025 | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | - | 0.4 | 0.0 | - | 0.1 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.1 | 0.0 |
| 2000 | - | - | - | 0.0 | 0.2 | - | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | - |
| 2005 | 2.4 | - | - | 1.5 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.5 | - | - | 0.8 | 0.8 | 0.0 | - | - |
| 2010 | 0.2 | - | 0.0 | - | 0.6 | 0.1 | 0.0 | - | - | 0.5 | - | 0.0 | - | 0.0 | 0.0 | - | - |
| 2015 | 0.0 | - | - | - | 0.0 | - | - | - | - | - | - | - | - | 0.0 | 0.0 | - | - |
| 2020 | - | 0.0 | - | 0.0 | 0.3 | - | - | 0.0 | - | - | - | - | - | - | 0.1 | - | - |
| 2025 | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Eriogonum cernuum[a] (nodding buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Oenothera (evening primrose) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1995 | - | 9 | - | - | 62 | 21 | - | 4 | - |
| 2000 | - | - | - | - | 43 | - | 31 | 6 | - |
| 2005 | 6 | 136 | 2 | 8 | 20 | 48 | 20 | 0 | 6 |
| 2010 | 10 | 108 | 1 | - | 39 | 71 | 1 | 12 | - |
| 2015 | - | 23 | - | - | 33 | 113 | 3 | 9 | - |
| 2020 | - | 6 | 29 | - | 30 | 50 | - | 3 | - |
| 2025 | - | 9 | - | - | 23 | 4 | - | - | - |
| year | Average Cover (%) | | | | | | | | |
| 1995 | - | 0.0 | - | - | 0.2 | 0.0 | - | 0.0 | - |
| 2000 | - | - | - | - | 0.1 | - | 0.1 | 0.0 | - |
| 2005 | 0.0 | 1.5 | 0.0 | 0.0 | 0.2 | 0.5 | 0.0 | 0.0 | 0.0 |
| 2010 | 0.2 | 0.2 | 0.0 | - | 0.3 | 0.1 | 0.0 | 0.0 | - |
| 2015 | - | 0.1 | - | - | 0.1 | 0.3 | 0.0 | 0.0 | - |
| 2020 | - | 0.0 | 0.2 | - | 0.3 | 0.2 | - | 0.0 | - |
| 2025 | - | 0.0 | - | - | 0.1 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-17.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Ephedra viridis[p] (mormon tea) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) | Sclerocactus (fishhook cactus) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | - | 23 | - | - | - | 3.4 | 3.6 | 0.6 | - |
| 2010 | - | 21.1 | - | - | - | 0.9 | 4 | 0.5 | - |
| 2015 | - | 18.5 | - | - | - | 0.7 | 4 | 0.7 | - |
| 2020 | - | 18 | - | - | - | 0.4 | 1.2 | 0.7 | - |
| 2025 | - | 12.8 | - | - | - | 1.3 | 3 | 0.7 | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 1995 | - | 17.4 | - | - | - | 1.0 | 1.9 | 0.3 | - |
| 2000 | 0.1 | 19.2 | 0.4 | - | - | 0.2 | 0.0 | 0.2 | - |
| 2005 | - | 17.6 | - | - | - | 1.9 | 1.6 | 0.3 | - |
| 2010 | - | 19.5 | - | - | - | 1.7 | 1.1 | 0.7 | - |
| 2015 | - | 19.2 | - | - | - | 0.5 | 1.3 | 0.9 | 0.0 |
| 2020 | - | 19.8 | - | 0.0 | - | 0.4 | 0.7 | 0.5 | - |
| 2025 | - | 12.1 | - | - | 0.0 | 1.0 | 0.0 | 0.8 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-17.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 5600 | 700 | 20 | 62 | 18 | 74 | 4 | 4 | 50/83 |
| 2000 | 5880 | 140 | 24 | 51 | 25 | 38 | 22 | 9 | 45/75 |
| 2005 | 5140 | 112380 | 32 | 37 | 31 | 28 | 27 | 20 | 54/81 |
| 2010 | 7880 | 160 | 44 | 38 | 17 | 29 | 16 | 9 | 43/70 |
| 2015 | 7580 | 240 | 40 | 42 | 18 | 32 | 65 | 23 | 42/79 |
| 2020 | 5700 | - | 29 | 54 | 18 | 53 | 17 | 21 | 44/69 |
| 2025 | 5240 | - | 17 | 42 | 41 | 7 | 89 | 41 | - / - |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 47/107 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 4940 | 540 | 40 | 60 | 0 | 1 | 0 | 0 | 24/24 |
| 2000 | 1000 | 60 | 2 | 90 | 8 | 0 | 0 | 4 | 12/15 |
| 2005 | 1140 | 1060 | 11 | 90 | 0 | 0 | 0 | 0 | 36/49 |
| 2010 | 2220 | 20 | 19 | 78 | 3 | 0 | 0 | 3 | 17/19 |
| 2015 | 3840 | 180 | 64 | 35 | 1 | 19 | 1 | 2 | 21/24 |
| 2020 | 6220 | 1140 | 30 | 70 | 0 | 0 | 0 | 0 | 12/11 |
| 2025 | 1200 | - | 0 | 98 | 2 | 0 | 0 | 2 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 60 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 80 | - | 50 | 50 | 0 | 0 | 0 | 25 | 169/177 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/48 |
| 2000 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/50 |
| 2005 | 200 | - | 0 | 90 | 10 | 0 | 0 | 0 | 17/82 |
| 2010 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/68 |
| 2015 | 520 | 20 | 4 | 96 | 0 | 4 | 0 | 15 | 15/53 |
| 2020 | 600 | - | 0 | 97 | 3 | 0 | 3 | 17 | 14/45 |
| 2025 | 1140 | - | 0 | 75 | 25 | 0 | 0 | 19 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 7/12 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

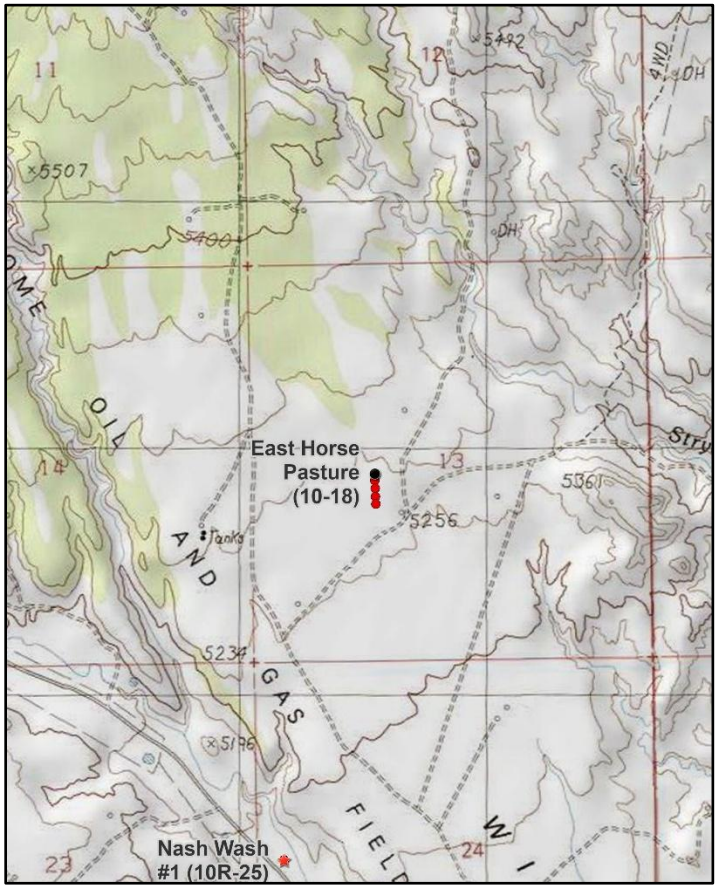
**Table 10-17.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

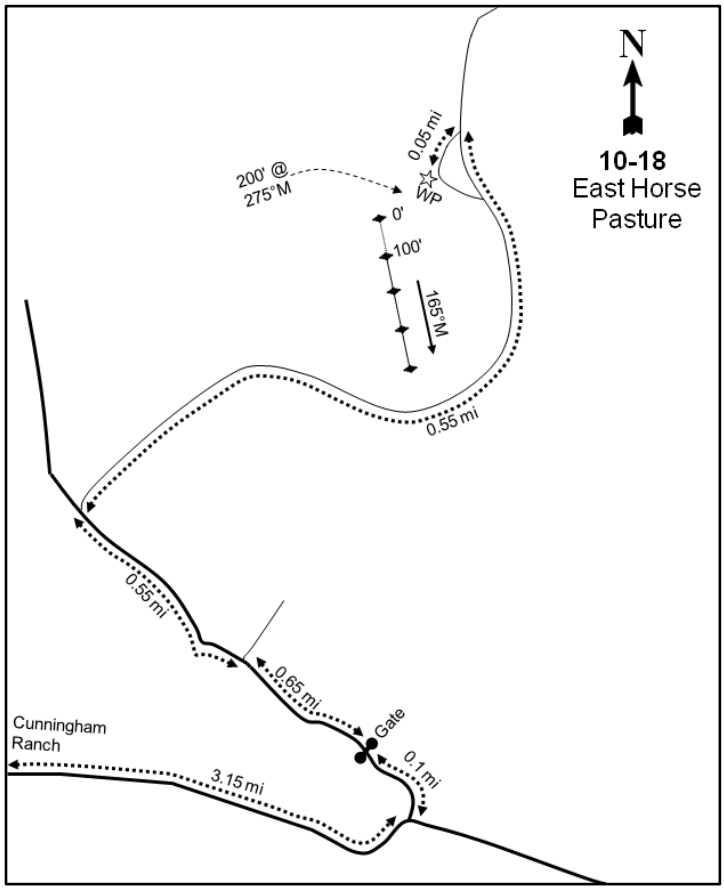
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 37 | - | - | - | - | - | 6.1 |
| 2005 | 42 | - | 50 | 38 | 13 | - | 9.7 |
| 2010 | 47 | - | 71 | 24 | 6 | - | 5.0 |
| 2015 | 55 | - | 65 | 29 | 6 | - | 11.6 |
| 2020 | 52 | - | 47 | 29 | 18 | 6 | 7.7 |
| 2025 | 5 | - | 100 | - | - | - | 2.6 |

**Table 10-17.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 21.8 | 9.8 | 10.2 | 1.3 | -12.6 | 1.4 | 0.0 | **31.9** | Fair |
| 2000 | 24.7 | 7.3 | 11.7 | 0.8 | -0.8 | 0.8 | 0.0 | **44.5** | Fair-Good |
| 2005 | 28.8 | 5.7 | 15.0 | 1.8 | -1.4 | 3.5 | 0.0 | **53.4** | Good |
| 2010 | 26.4 | 9.8 | 15.0 | 3.5 | -0.5 | 2.3 | 0.0 | **56.5** | Good |
| 2015 | 23.1 | 9.6 | 15.0 | 2.4 | -3.1 | 0.3 | 0.0 | **47.3** | Good |
| 2020 | 22.5 | 9.8 | 14.4 | 3.4 | -13.7 | 1.4 | 0.0 | **37.8** | Fair |
| 2025 | 16.0 | 2.6 | 8.6 | 1.9 | -0.4 | 0.3 | 0.0 | **29.0** | Fair |

# EAST HORSE PASTURE - STUDY NO. 10-18




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Calf Canyon NE; Township 20S, Range 21E, Section 13 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 625491 East 4325098 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9143 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Cunningham Ranch, travel south 3.15 miles to a fork. Turn left and go 0.1 miles to a gate. Continue another 0.65 miles to a fork. Stay left (remain on the main road) and continue 0.55 miles to another fork. Turn right and go 0.55 miles to a faint road that turns back to the left. Go 0.05 miles on this faint road to a two-foot tall rebar witness post to the right (west). The 0-foot stake is 200 feet (67 paces) west of the witness post at a bearing of 275 degrees magnetic and is marked by browse tag #9143.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | CISCO |
| Elevation | 5,300ft (1,615m) |
| Aspect | South |
| Slope | 3% |
| Sample Dates | 06/12/1995, 06/01/2000, 06/01/2005, 06/02/2010, 05/27/2015, 05/26/2020, 05/27/2025 |

**Table 10-18.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial | Moab Cheat grass control and seeding (Proposed) | 7359 | Fall 2025 | 9029 |
| Herbicide - Imazapic | Moab Field Office Cheatgrass Control | 5573 | November 2023 | 9714 |

## Wildlife Habitat and Vegetation History

**Table 10-18.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Pronghorn | crucial | year-long |

**Table 10-18.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Annual Grass/Wyoming Big Sagebrush | No Encroachment |
| 1995 | Annual Grass/Wyoming Big Sagebrush | No Encroachment |
| 2000 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2005 | Annual Grass/Wyoming Big Sagebrush | Early Phase I |
| 2010 | Annual Grass/Wyoming Big Sagebrush | Early Phase I |
| 2015 | Annual Grass/Wyoming Big Sagebrush | Early Phase I |
| 2020 | Annual Grass/Wyoming Big Sagebrush | Early Phase I |
| 2025 | Perennial Grass/Annual Forb | Early Phase I |

## Site Notes

There is a small drainage that runs through the site that has a different ESD which is likely Semidesert Sandy Loam (Fourwing Saltbush), R034BY216UT.

## Soils

**Table 10-18.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.4 | 48.0 | 24.0 | 28.0 | 1.1 | 4.5 | 108.8 | 0.7 | 06/01/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1986-2020 - Current Potential State: Community Phase 2.4<br>2025 - Current Potential State: Community Phase 2.3 |

From study establishment in 1986 through the 2020 sample year, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) was a dominant component of the vegetation community on this site. The introduced annual grass species cheatgrass (*Bromus tectorum*) provided a majority of the herbaceous cover and was a co-dominant vegetation component during this time. Cover and density of Wyoming big sagebrush have steadily decreased since 2000, however, and sagebrush was considered to be a minor community component in 2025 (Photos, Pre-1992 Data, Table 10-18.12, Table 10-18.13). Annual grass cover also decreased in 2025 after a herbicide treatment in 2023 (Table 10-18.1); perennial grasses and annual forbs dominated this site during the most recent sample year (Table 10-18.7, Table 10-18.10, Table 10-18.11). Although not recorded in point-quarter density until 2015 (Table 10-18.14), photos reveal that Utah juniper (*Juniperus osteosperma*) has been present along the transect since 2000; there may be potential for further tree infilling over time. However, the site has been considered to be within Early Phase I of woodland succession since 2000 (Table 10-18.4), indicating that further infilling likely does not pose an immediate threat. Should cheatgrass increase again in future sample years, however, the ecological resistance and resilience of the plant community on this site could be negatively affected.

Condition of mule deer winter range on this site has ranged between very poor and fair since 1995; winter range condition was considered to be fair in 2025. Negative factors contributing to this fair condition include low cover and a lack of recruitment of young within the preferred browse community; reduced perennial grass cover; the amount of annual grass cover; and a lack of perennial forb cover (Table 10-18.6, Table 10-18.7, Table 10-18.13, Table 10-18.15). Pellet transect data indicates that deer presence has been moderate to high in all sample years since 2000. During the 2024/25 winter season the study site had frequent occurrences of collared mule deer (Wildlife Migration Initiative). Over 90% of sagebrush plants sampled in density strips have shown signs of moderate to heavy use between 2015 and 2025; at least 70% of fourwing saltbush (*Atriplex canescens*) plants have exhibited that level of utilization over the same period. In addition, decadence of sagebrush has increased since 1995. As such, it is reasonable to assume that sustained moderate-heavy utilization by deer in combination with other factors (climatic, etc.) has contributed to this increasingdecadence within the sagebrush population. Elk presence was low in 2005 and 2010, but pellet groups have not been observed in any other sample year (Table 10-18.9, Table 10-18.13). On-site observations for 2025 note that little utilization was evident on herbaceous species.

## Trend Summary Tables

**Table 10-18.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 8.5 | 2.5 | - | - | - | - |
| 2000 | 12.6 | 1.0 | - | - | - | - |
| 2005 | 7.6 | 1.8 | - | 12.0 | 2.5 | - |
| 2010 | 9.9 | 1.7 | - | 14.2 | 0.8 | - |
| 2015 | 6.6 | 1.7 | - | 10.2 | 2.2 | - |
| 2020 | 5.3 | 3.2 | - | 7.9 | 1.6 | - |
| 2025 | 2.8 | 2.6 | - | 5.6 | 2.2 | - |

**Table 10-18.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 434 | 101 | 239 | 53 | 27.3 | 1.6 | 0.6 | 0.8 |
| 2000 | 203 | 138 | 158 | 54 | 7.0 | 4.3 | 4.1 | 0.9 |
| 2005 | 439 | 110 | 275 | 41 | 33.8 | 2.9 | 7.9 | 0.7 |
| 2010 | 390 | 86 | 265 | 58 | 27.0 | 3.0 | 13.7 | 1.3 |
| 2015 | 438 | 106 | 281 | 43 | 22.5 | 3.7 | 3.8 | 0.7 |
| 2020 | 489 | 60 | 141 | 30 | 40.6 | 1.9 | 2.4 | 0.2 |
| 2025 | 114 | 102 | 86 | 25 | 0.8 | 5.0 | 3.5 | 0.3 |

**Table 10-18.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 28.6 | 2.1 | 48.1 | 0.1 | 0.1 | 43.2 |
| 2000 | 44.5 | 1.4 | 36.7 | 0.9 | 0.0 | 32.7 |
| 2005 | 35.8 | 0.3 | 19.0 | 0.5 | 0.0 | 51.2 |
| 2010 | 23.0 | 2.1 | 57.6 | 0.7 | - | 49.5 |
| 2015 | 36.3 | 0.3 | 40.7 | 0.2 | 0.0 | 41.7 |
| 2020 | 22.3 | 1.1 | 52.9 | 0.6 | - | 51.3 |
| 2025 | 32.5 | 1.0 | 62.2 | 0.4 | 0.0 | 16.1 |

**Table 10-18.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit | Domestic Sheep |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1995 | - | 1 | - | 17 | 1 | 22 | - |
| 2000 | - | - | - | 41 | - | 23 | - |
| 2005 | - | - | - | 28 | 3 | 28 | 2 |
| 2010 | 1 | - | - | 42 | 6 | 18 | - |
| 2015 | - | - | - | 60 | 3 | 34 | - |
| 2020 | 11 | - | - | 22 | 3 | 12 | - |
| 2025 | - | 7 | - | 47 | - | 60 | 1 |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1995 | - | - | - | - | - | - | - |
| 2000 | - | - | 8.7 (21.5)* | 27.5 (67.9) | - | - | - |
| 2005 | - | 3.6 (9.0) | - | 48.3 (119.2) | 4.0 (9.9) | - | - |
| 2010 | - | - | - | 20.1 (49.7) | 14.7 (36.4) | - | - |
| 2015 | - | - | - | 63.7 (157.3) | - | - | - |
| 2020 | 6.7 (16.6) | - | - | 44.2 (109.2) | - | - | - |
| 2025 | - | 35.6 (87.9) | 8.7 (21.5)* | 32.2 (79.5) | - | - | - |

*Pellets per acre (ha)

**Table 10-18.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | 2 | 429 | 20 | 3 | 62 | 14 | 31 |
| 2000 | 0 | 203 | 29 | 3 | 98 | 35 | - |
| 2005 | 9 | 424 | 11 | - | 96 | 3 | 88 |
| 2010 | 1 | 390 | 5 | 1 | 75 | 5 | - |
| 2015 | 9 | 438 | 8 | 2 | 87 | 11 | 7 |
| 2020 | 13 | 489 | 1 | 1 | 50 | - | 14 |
| 2025 | 3 | 113 | 5 | - | 84 | 11 | 5 |
| year | Average Cover (%) | | | | | | |
| 1995 | 0.0 | 27.2 | 0.3 | 0.0 | 1.3 | 0.1 | 0.1 |
| 2000 | 0.0 | 7.0 | 0.5 | 0.0 | 3.3 | 0.6 | - |
| 2005 | 0.2 | 33.3 | 0.1 | - | 2.5 | 0.0 | 0.5 |
| 2010 | 0.5 | 27.0 | 0.1 | 0.0 | 2.3 | 0.1 | - |
| 2015 | 0.4 | 22.4 | 0.0 | 0.3 | 2.7 | 0.3 | 0.0 |
| 2020 | 0.3 | 40.6 | 0.0 | 0.0 | 1.6 | - | 0.0 |
| 2025 | 0.6 | 0.8 | 0.0 | - | 4.0 | 0.3 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-18.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella hutchinsifolia[a] (desert pale gilia) | Alyssum desertorum[ai] (desert madwort) | Astragalus (milkvetch) | Calochortus nuttallii (sego lily) | Chaetopappa ericoides (rose heath) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron (fleabane) | Erigeron utahensis (Utah fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum var. montanum[a] (mountain pepperweed) | Machaeranthera grindelioides (rayless tansyaster) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | 10 | - | - | 7 | - | - | 5 | - | 3 | 36 | 33 | 2 | 4 |
| 2000 | - | - | 1 | - | 18 | - | - | 3 | 1 | - | - | 12 | - | - | 3 | - | 3 |
| 2005 | 7 | - | - | 0 | - | - | 5 | 87 | - | - | - | 16 | - | 96 | 47 | - | 4 |
| 2010 | 3 | - | - | - | 9 | - | 2 | 82 | 3 | - | - | 14 | - | 157 | 6 | 9 | - |
| 2015 | 2 | - | - | - | 12 | 5 | - | 3 | - | 2 | - | 87 | - | 31 | 5 | - | - |
| 2020 | - | 7 | 1 | - | 2 | - | - | 6 | - | - | - | 93 | - | 3 | 1 | - | 4 |
| 2025 | - | - | - | - | 3 | - | - | - | - | - | - | 3 | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | 0.1 | - | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 |
| 2000 | - | - | 0.0 | - | 0.2 | - | - | 0.0 | 0.0 | - | - | 0.2 | - | - | 0.0 | - | 0.0 |
| 2005 | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.7 | - | - | - | 0.5 | - | 0.5 | 1.0 | - | 0.0 |
| 2010 | 0.0 | - | - | - | 0.4 | - | 0.0 | 2.2 | 0.1 | - | - | 0.1 | - | 1.4 | 0.5 | 0.0 | - |
| 2015 | 0.0 | - | - | - | 0.4 | 0.0 | - | 0.0 | - | 0.0 | - | 1.9 | - | 0.2 | 0.0 | - | - |
| 2020 | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | 2.1 | - | 0.0 | 0.0 | - | 0.0 |
| 2025 | - | - | - | - | 0.1 | - | - | - | - | - | - | 0.2 | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 171 | - | 2 | 31 | 30 |
| 2000 | - | 119 | - | 57 | 34 |
| 2005 | 138 | 9 | 7 | 41 | 32 |
| 2010 | 20 | 147 | - | - | 40 |
| 2015 | 133 | 71 | - | 10 | 30 |
| 2020 | 35 | - | - | 4 | 23 |
| 2025 | 6 | 77 | - | - | 22 |
| year | Average Cover (%) | | | | |
| 1995 | 0.3 | - | 0.0 | 0.2 | 0.7 |
| 2000 | - | 1.3 | - | 2.5 | 0.8 |
| 2005 | 1.5 | 0.0 | 0.0 | 3.7 | 0.6 |
| 2010 | 0.0 | 9.3 | - | - | 0.9 |
| 2015 | 0.9 | 0.6 | - | 0.1 | 0.3 |
| 2020 | 0.2 | - | - | 0.0 | 0.2 |
| 2025 | 0.0 | 3.3 | - | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-18.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | - | - | - | - |
| 2005 | 11.3 | 0.6 | 0.1 | 2.3 | 0.2 |
| 2010 | 11 | 3.2 | - | 0.4 | 0.4 |
| 2015 | 6.3 | 3.9 | - | 1.2 | 1 |
| 2020 | 4.7 | 3.2 | - | 0.5 | 1.1 |
| 2025 | 0.7 | 4.9 | - | 1.5 | 0.7 |
| year | Quadrat Cover (%) | | | | |
| 1995 | 8.5 | - | 0.0 | 2.5 | 0.0 |
| 2000 | 11.6 | 0.0 | 1.0 | 1.0 | 0.0 |
| 2005 | 7.0 | 0.6 | 0.0 | 1.7 | 0.1 |
| 2010 | 5.4 | 4.5 | - | 1.4 | 0.3 |
| 2015 | 4.7 | 1.9 | - | 0.6 | 1.1 |
| 2020 | 3.5 | 1.8 | - | 2.0 | 1.2 |
| 2025 | 0.5 | 2.4 | - | 1.8 | 0.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-18.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 2660 | - | 0 | 82 | 18 | 50 | 14 | 8 | 56/87 |
| 2000 | 2940 | - | 1 | 74 | 25 | 33 | 18 | 12 | 52/82 |
| 2005 | 2200 | - | 5 | 55 | 41 | 45 | 38 | 19 | 62/91 |
| 2010 | 1900 | - | 0 | 65 | 35 | 46 | 15 | 19 | 53/73 |
| 2015 | 1580 | - | 0 | 39 | 61 | 9 | 87 | 61 | 46/75 |
| 2020 | 1080 | - | 0 | 48 | 52 | 28 | 63 | 69 | 46/65 |
| 2025 | 540 | - | 0 | 11 | 89 | 0 | 100 | 89 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 108/166 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 82/164 |
| 2005 | 340 | 20 | 77 | 24 | 0 | 0 | 35 | 0 | 69/94 |
| 2010 | 480 | 20 | 4 | 96 | 0 | 46 | 4 | 0 | 62/73 |
| 2015 | 640 | - | 0 | 94 | 6 | 47 | 53 | 13 | 59/81 |
| 2020 | 580 | - | 7 | 14 | 79 | 72 | 24 | 100 | 70/84 |
| 2025 | 540 | - | 4 | 89 | 7 | 52 | 26 | 7 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 78/142 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[P] -- (spiny hopsage) | | | | | | | | | |
| 1995 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 28/18 |
| 2000 | 20 | 20 | 0 | 0 | 100 | 0 | 0 | 100 | 108/241 |
| 2005 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 43/36 |
| 2010 | - | - | - | - | - | - | - | - | 40/41 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 8860 | 640 | 39 | 61 | 0 | 0 | 0 | 0 | 30/30 |
| 2000 | 1220 | - | 46 | 54 | 0 | 0 | 0 | 0 | 18/21 |
| 2005 | 2640 | - | 1 | 99 | 0 | 0 | 0 | 0 | 32/31 |
| 2010 | 1180 | 100 | 15 | 70 | 15 | 0 | 0 | 9 | 22/25 |
| 2015 | 4300 | 100 | 46 | 53 | 1 | 21 | 0 | 1 | 19/19 |
| 2020 | 16520 | 1100 | 26 | 74 | 0 | 0 | 0 | 0 | 12/12 |
| 2025 | 1780 | - | 2 | 98 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/16 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 11/36 |
| 2000 | 80 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 11/40 |
| 2005 | 160 | - | 13 | 75 | 13 | 0 | 0 | 13 | 17/50 |
| 2010 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/45 |
| 2015 | 380 | - | 5 | 95 | 0 | 0 | 0 | 0 | 17/58 |
| 2020 | 340 | - | 0 | 88 | 12 | 0 | 0 | 35 | 13/36 |
| 2025 | 420 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 23/13 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

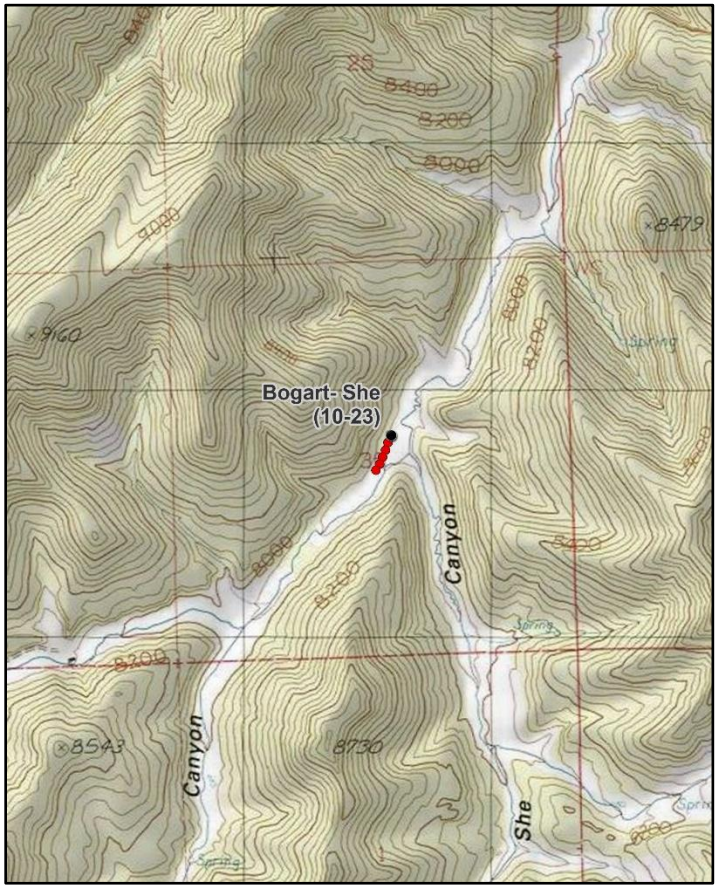
**Table 10-18.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

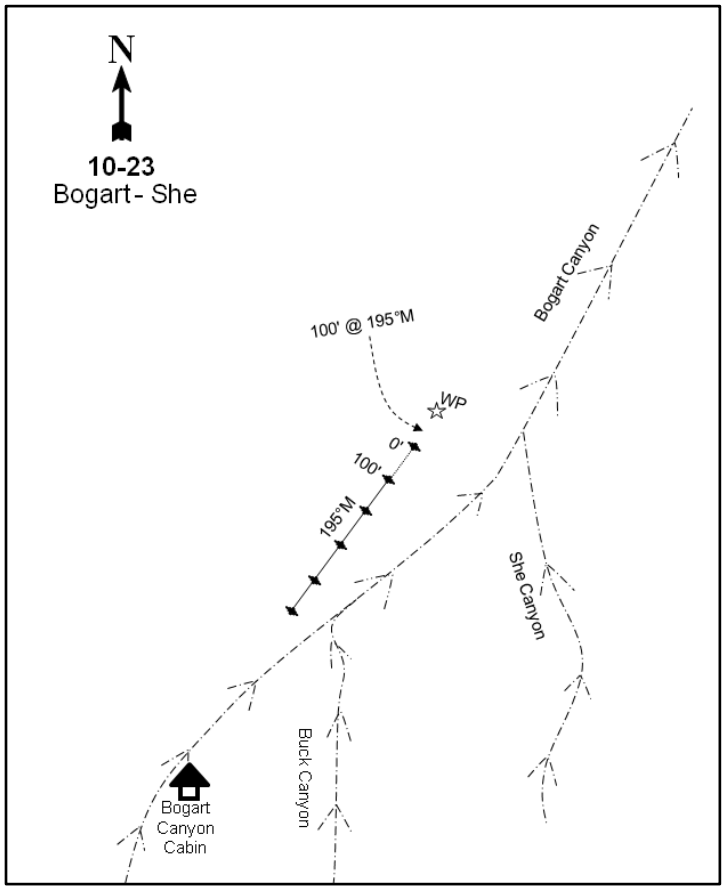
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 22 | - | 50 | 17 | 33 | - | 8.2 |
| 2020 | 14 | - | 50 | 17 | 33 | - | 6.5 |
| 2025 | 15 | - | 25 | 25 | 25 | 25 | 11.8 |

**Table 10-18.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 10.6 | 9.6 | 0.0 | 3.2 | -20.0 | 1.5 | 0.0 | **4.9** | Very Poor |
| 2000 | 15.5 | 5.7 | 0.6 | 8.6 | -5.2 | 1.9 | 0.0 | **27.1** | Fair |
| 2005 | 15.0 | 3.3 | 4.0 | 5.7 | -20.0 | 1.4 | 0.0 | **9.4** | Very Poor-Poor |
| 2010 | 17.8 | 7.0 | 0.5 | 5.9 | -20.0 | 2.6 | 0.0 | **13.8** | Poor |
| 2015 | 12.8 | 3.0 | 0.0 | 7.3 | -16.8 | 1.3 | 0.0 | **7.6** | Very Poor |
| 2020 | 9.9 | 2.2 | 1.4 | 3.9 | -20.0 | 0.4 | 0.0 | **-2.2** | Very Poor |
| 2025 | 7.0 | 12.7 | 1.6 | 10.0 | -0.6 | 0.6 | 0.0 | **31.3** | Fair |

# BOGART- SHE - STUDY NO. 10-23




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Bogart Canyon NE; Township 18S, Range 20E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 615545 East 4340014 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 195° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | No Rebar |

**Directions to Site**

From the Bogart Canyon cabin, travel northeast through the drainage to the confluence of She Canyon and Bogart Canyon; there is a witness post located just off of the trail. The 0-foot baseline stake is located 100 feet from the witness post at 195 degrees magnetic. The baseline also runs at 195 degrees magnetic. All transect stakes are rebar that are 2-3 inches out of the ground.

| Site Information | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | BOGART |
| Elevation | 7,850ft (2,393m) |
| Aspect | West |
| Slope | 8-10% |
| Sample Dates | 09/12/1995, 07/01/2015, 06/18/2020, 08/12/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-23.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-23.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1995 | Perennial Grass-Forb | NA |
| 2015 | Perennial Grass-Forb | NA |
| 2020 | Perennial Grass-Forb | NA |
| 2025 | Perennial Grass-Forb | NA |

## Site Notes

The East Willow Creek Weed Control Inventory (WRI Project #741) was performed by the Utah Division of Wildlife, Grand County, and SITLA who partnered with each other to survey noxious weeds in the area. A bear was seen on the trail next to the site in 2025.

## Soils

**Table 10-23.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| | 6.8 | 0.0 | 0.0 | 0.0 | 3.2 | 22.0 | 344.0 | 0.4 | 07/01/2015 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 20 inches |
| NRCS Ecological Site | Mountain Loamy Bottom (Basin Wildrye) |
| NRCS Ecological Site # | R048AY410UT |
| States and Transitions | 1995-2025 - State Undefined: Community Phase Undefined |

Since study establishment in 1995, this site has remained in a stable state with a plant community comprised of perennial grass and forb species (Table 10-23.7). The herbaceous understory has remained moderately diverse and has been dominated by the perennial grass species Kentucky bluegrass (*Poa pratensis*) and western wheatgrass (*Pascopyrum smithii*), and to a lesser extent, the perennial forbs smooth horsetail (*Equisetum laevigatum*) and western aster (*Symphyotrichum ascendens*). Other forbs have remained comparatively rare (Table 10-23.10, Table 10-23.11).

The diverse and abundant herbaceous understory on this site could provide good forage for summering mule deer. However, pellet transect data indicates that both deer and elk presence has remained absent to low since 1995. Bison presence has generally remained moderate to high; bison presence was highest in 2020. On-site observations state that there was heavy utilization of the herbaceous understory during the most recent sample year (2025). However, the understory does not appear to have been adversely affected by utilization but more by drought (Photos, Table 10-23.9, Table 10-23.10, Table 10-23.11).

## Trend Summary Tables

**Table 10-23.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | - | - | - | - | - | - |
| 2015 | - | - | 1.9 | - | - | 2.0 |
| 2020 | - | - | 1.9 | - | - | 2.1 |
| 2025 | 0.0 | - | 1.9 | 0.1 | - | 1.5 |

**Table 10-23.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 470 | 136 | 376 | - | 46.0 | 2.7 | 16.7 |
| 2015 | - | 489 | 150 | 378 | - | 74.1 | 3.4 | 19.9 |
| 2020 | - | 462 | 95 | 360 | - | 48.1 | 1.7 | 12.3 |
| 2025 | - | 476 | 177 | 330 | - | 49.0 | 3.1 | 14.9 |

**Table 10-23.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 8.3 | - | 57.1 | 0.5 | 1.0 | 65.4 |
| 2015 | 3.6 | 0.0 | 70.6 | 0.1 | 0.0 | 79.4 |
| 2020 | 17.1 | - | 51.5 | 0.1 | 0.2 | 59.7 |
| 2025 | 23.8 | - | 51.8 | 0.6 | 0.2 | 61.8 |

**Table 10-23.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Black Bear | American Bison | Mule Deer | Rocky Mountain Elk | Horse |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | - | 2 | 16 | 5 |
| 2015 | - | 3 | - | 5 | 2 |
| 2020 | - | 22 | - | 5 | 1 |
| 2025 | - | 22 | - | 21 | - |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2015 | 8.7 (21.5)* | 19.6 (48.4) | - | 5.3 (13.2) | 0.6 (1.4) |
| 2020 | - | 63.9 (157.8) | 0.7 (1.7) | 2.7 (6.6) | 6.4 (15.8) |
| 2025 | - | 45.7 (113.0) | - | 9.4 (23.2) | 1.7 (4.3) |

*Pellets per acre (ha)

**Table 10-23.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bouteloua gracilis (blue grama) | Bromus inermis[i] (smooth brome) | Carex (sedge) | Hesperostipa comata (needle and thread) | Juncus arcticus (arctic rush) | Koeleria macrantha (prairie Junegrass) | Muhlenbergia richardsonis (mat muhly) | Pascopyrum smithii (western wheatgrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | - | 0 | 28 | - | 63 | 27 | 16 | - | - | 209 | 444 | 2 |
| 2015 | - | - | 32 | 14 | - | 15 | 44 | 5 | - | 331 | 470 | - |
| 2020 | - | 10 | 44 | 20 | - | 16 | 80 | - | 7 | 309 | 394 | - |
| 2025 | 5 | 2 | 52 | 21 | 3 | 19 | 89 | - | 10 | 324 | 365 | 6 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | - | 0.0 | 0.3 | - | 3.3 | 0.5 | 0.6 | - | - | 6.0 | 35.3 | 0.0 |
| 2015 | - | - | 1.7 | 2.5 | - | 1.1 | 2.1 | 0.2 | - | 11.7 | 54.8 | - |
| 2020 | - | 1.0 | 3.0 | 2.5 | - | 0.8 | 5.1 | - | 0.0 | 13.0 | 22.6 | - |
| 2025 | 0.0 | 0.0 | 3.8 | 2.3 | 0.0 | 0.4 | 5.8 | - | 0.2 | 10.9 | 25.4 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-23.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Artemisia dracunculus (tarragon) | Artemisia ludoviciana (white sagebrush) | Chenopodium atrovirens[a] (pinyon goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Draba[a] (draba) | Dracocephalum parviflorum (American dragonhead) | Equisetum laevigatum (smooth horsetail) | Erigeron divergens[a] (spreading fleabane) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Heterotheca villosa (hairy false goldenaster) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 33 | - | 8 | 0 | 31 | 12 | - | - | - | 290 | - | 3 | - | - | - | 41 | 79 |
| 2015 | 91 | 6 | 72 | 7 | 25 | - | - | 5 | 18 | 278 | 1 | - | 15 | 6 | 9 | 23 | 12 |
| 2020 | 46 | 8 | - | 16 | 8 | 26 | - | - | 2 | 245 | - | 6 | 6 | 9 | 1 | - | - |
| 2025 | 18 | 4 | 12 | 14 | 6 | 97 | 19 | 3 | 5 | 257 | - | 4 | - | 3 | 7 | 50 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.7 | - | 0.0 | 0.0 | 0.4 | 0.1 | - | - | - | 8.7 | - | 0.0 | - | - | - | 0.3 | 1.4 |
| 2015 | 2.9 | 0.0 | 1.9 | 0.3 | 0.6 | - | - | 0.0 | 0.3 | 5.3 | 0.0 | - | 0.3 | 0.2 | 0.1 | 0.1 | 0.0 |
| 2020 | 1.0 | 0.1 | - | 0.6 | 0.1 | 0.4 | - | - | 0.0 | 2.6 | - | 0.1 | 0.0 | 0.3 | 0.0 | - | - |
| 2025 | 0.2 | 0.0 | 0.1 | 0.8 | 0.5 | 1.2 | 0.1 | 0.0 | 0.1 | 6.6 | - | 0.0 | - | 0.1 | 0.0 | 0.7 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lithospermum ruderale (western stoneseed) | Microsteris gracilis[a] (slender phlox) | Oenothera pallida[a] (pale evening primrose) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Silene drummondii var. drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1995 | - | - | 5 | 54 | 5 | 1 | 193 | 127 | - |
| 2015 | - | - | 87 | 2 | - | - | 196 | 91 | 4 |
| 2020 | 15 | 7 | 66 | 3 | - | - | 211 | 43 | 4 |
| 2025 | - | 22 | 75 | 7 | - | - | 212 | 1 | 10 |
| year | Average Cover (%) | | | | | | | | |
| 1995 | - | - | 0.0 | 0.9 | 0.1 | 0.0 | 5.2 | 1.5 | - |
| 2015 | - | - | 1.0 | 0.0 | - | - | 8.7 | 1.2 | 0.4 |
| 2020 | 0.1 | 0.0 | 1.1 | 0.0 | - | - | 6.8 | 0.6 | 0.2 |
| 2025 | - | 0.1 | 0.7 | 0.0 | - | - | 6.6 | 0.0 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-23.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Picea engelmannii[t] (Engelmann spruce) | Populus tremuloides[tp] (quaking aspen) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 1995 | - | - | - | - |
| 2015 | - | - | 2 | - |
| 2020 | 0 | - | 2 | 0.1 |
| 2025 | 0.1 | - | 1.4 | 0.1 |
| year | Quadrat Cover (%) | | | |
| 1995 | - | - | - | - |
| 2015 | - | - | 1.9 | - |
| 2020 | 0.0 | - | 1.9 | 0.0 |
| 2025 | 0.0 | 0.0 | 1.9 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-23.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 46/51 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/22 |
| 2025 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 33/72 |
| 2025 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 77/42 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 41/39 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-23.13a - Aspen Characteristics.** Characteristics of aspen populations including density, size class distribution, and vigor of plants.

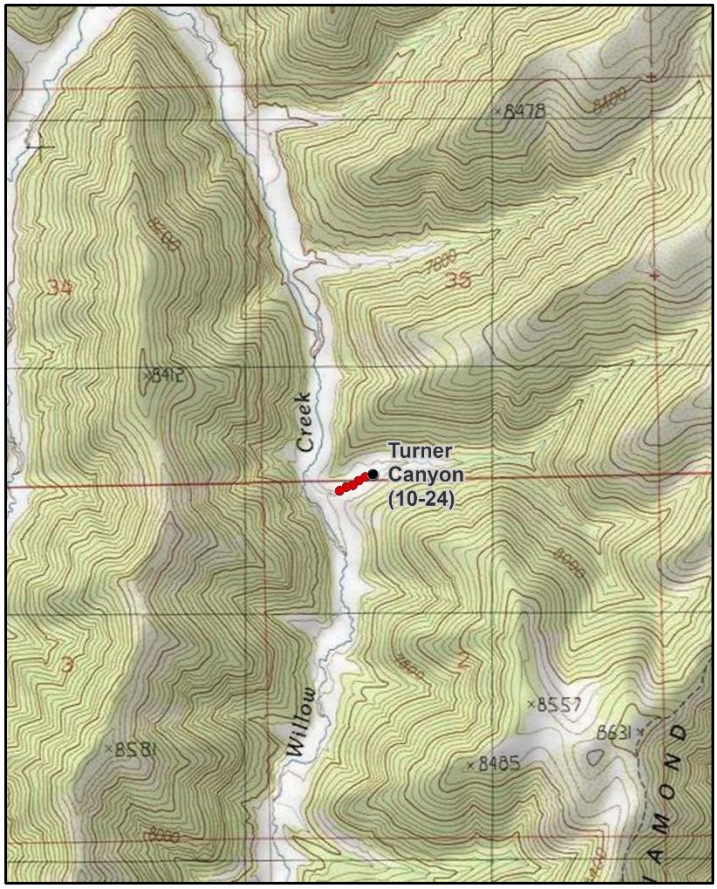
| Year | Density | Size Class Distribution | | | | Utilization | | Poor Vigor (%) |
|---|---|---|---|---|---|---|---|---|
| | Plants per Acre | Class I (%) | Class II (%) | Class III (%) | Class IV (%) | Moderate (%) | Heavy (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | | |
| 2015 | 80 | 75 | 25 | - | - | 100 | 0 | 0 |
| 2020 | 20 | 100 | - | - | - | 0 | 0 | 0 |
| 2025 | 80 | 50 | 50 | - | - | 100 | 0 | 0 |

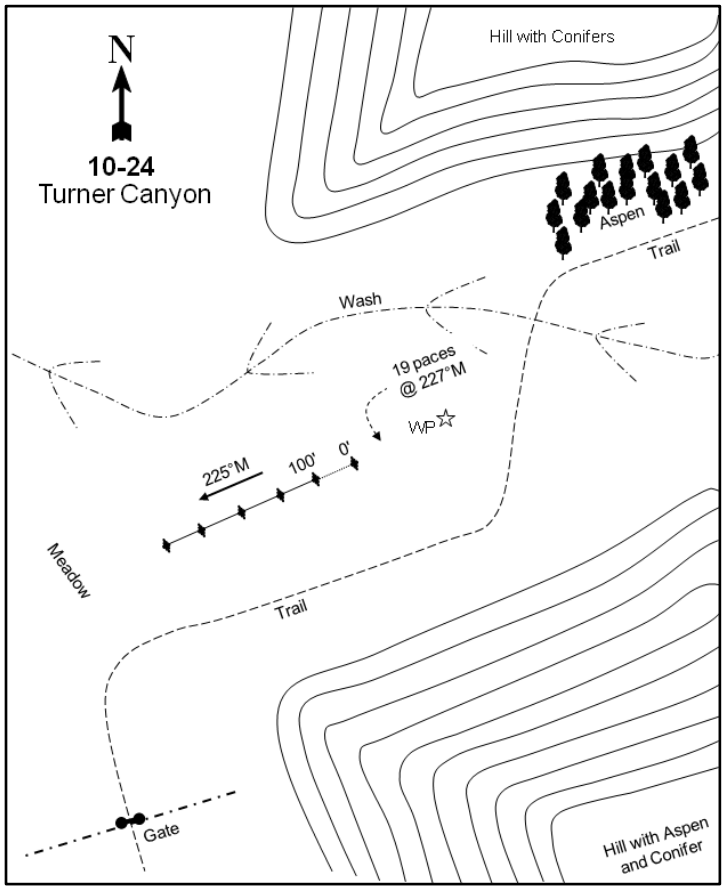
Class I - <= 1.5 feet; Class II - > 1.5 feet to 5 feet; Class III - > 5 feet and up to 1 inch diameter at breast height (dbh); Class IV - > 1 in diameter at breast height (dbh)

**Table 10-23.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | |
| 2020 | 7 | - | 100 | - | - | - | 3.5 |
| 2025 | 15 | 100 | - | - | - | - | 1.0 |

# TURNER CANYON - STUDY NO. 10-24




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Tenmile Canyon South; Township 18S, Range 21E, Section 02 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 623461 East 4348739 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 205° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | No Rebar |

**Directions to Site**

From the "road closed" sign, walk for about 30-40 minutes south along Diamond Ridge until you reach a definite fork in the trail and a rock cairn at about 1.5 miles. The small side road to the right is the Turner Canyon Trail: it is well-worn and used by horses. Follow the Turner Canyon Trail to the bottom of the canyon where you will go through a gate. Continue down the trail until you break out of the aspen into the wider part of the canyon mouth. The transect will be on the south side of the wash in a basin wildrye (*Leymus cinereus*) and grass community type. A witness post marks the transect. Walk 19 paces from the witness post at 227 degrees magnetic to the 0-foot baseline stake. The baseline runs 225 degrees magnetic.

**Follow the trail into the canyon -- *do not* make your own way.**

| Site Information | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | BOGART |
| Elevation | 7,400ft (2,256m) |
| Aspect | Southwest |
| lope | 3-5% |
| Sample Dates | 09/20/1995, 06/22/2000, 06/09/2015, 06/10/2020, 06/19/2025 |

**Table 10-24.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Diamond Creek | - | 2002 | 88421 |

## Wildlife Habitat and Vegetation History

**Table 10-24.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-24.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1990 | Perennial Grass | NA |
| 1995 | Perennial Grass | NA |
| 2000 | Perennial Grass | NA |
| 2015 | Perennial Grass | NA |
| 2020 | Perennial Grass | NA |
| 2025 | Perennial Grass | NA |

## Site Notes

No Notes

## Soils

**Table 10-24.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.9 | 57.3 | 24.2 | 18.6 | 2.9 | 17.4 | 416.0 | 0.7 | 06/22/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Loamy Bottom (Basin Wildrye) |
| NRCS Ecological Site # | R048AY410UT |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1990 and despite the Diamond Creek Wildfire in 2002 (Pre-1992 Data, Table 10-24.1), the plant community on this site has remained in a stable perennial grass state (Table 10-24.7). The herbaceous understory has remained moderately diverse and has been dominated by perennial grasses including thickspike wheatgrass (*Elymus lanceolatus*), needle and thread (*Hesperostipa comata*), and Kentucky bluegrass (*Poa pratensis*), among others. Perennial forbs have also contributed significant cover throughout the duration of the study (Table 10-24.10, Table 10-24.11). A mixed stand of quaking aspen (*Populus tremuloides*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) seen in the background in photos appears to have lost much of its cover due to the wildfire. Although sagebrush has not entirely recovered, the aspen stand has rejuvenated and will likely recover.

The diverse and abundant herbaceous understory on this site could provide good forage for summering mule deer. However, pellet transect data indicates that both deer and elk presence has remained absent to low since 1995. Cattle and/or bison presence has generally remained low to moderate; bison presence was highest in 2020 (Photos, Table 10-24.9, Table 10-24.10, Table 10-24.11). On-site observations state that there was no to little utilization of the herbaceous understory during the most recent sample year (2025).

## Trend Summary Tables

**Table 10-24.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 6.0 | - | - | - | - | - |
| 2000 | 0.4 | - | - | - | - | - |
| 2015 | 1.7 | - | - | 0.5 | - | - |
| 2020 | 1.7 | - | - | 1.0 | - | - |
| 2025 | 1.9 | - | - | 2.0 | - | - |

**Table 10-24.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 2 | 479 | 155 | 288 | 0.0 | 38.7 | 2.4 | 10.9 |
| 2000 | - | 488 | 35 | 272 | - | 48.8 | 0.4 | 11.8 |
| 2015 | 17 | 466 | 55 | 258 | 0.1 | 53.5 | 0.3 | 15.5 |
| 2020 | 6 | 422 | 81 | 295 | 0.0 | 39.8 | 0.9 | 18.4 |
| 2025 | 31 | 438 | 221 | 201 | 1.6 | 38.9 | 3.9 | 11.0 |

**Table 10-24.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 5.0 | 0.1 | 71.2 | 2.9 | 0.3 | 55.9 |
| 2000 | 3.9 | 0.2 | 80.0 | 1.2 | 0.2 | 67.5 |
| 2015 | 8.7 | 0.8 | 51.2 | 1.6 | 0.0 | 67.2 |
| 2020 | 10.5 | 0.0 | 51.6 | 6.0 | 0.1 | 56.1 |
| 2025 | 17.3 | - | 43.5 | 4.8 | 0.8 | 54.2 |

**Table 10-24.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle/Bison | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | 1 | 3 | 17 | - | 1 | 3 |
| 2000 | - | - | 4 | - | - | 2 |
| 2015 | 1 | - | 13 | - | 1 | - |
| 2020 | 7 | - | 3 | - | 6 | 1 |
| 2025 | 25 | 8 | 7 | - | 1 | - |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 2.2 (5.4) | - | 9.4 (23.2) | 8.7 (21.5)* | - | - |
| 2015 | 8.0 (19.7) | 2.7 (6.6) | 16.8 (41.4) | - | - | - |
| 2020 | 31.9 (78.9) | 2.0 (5.0) | 9.4 (23.2) | - | 6.4 (15.8) | - |
| 2025 | 26.2 (64.6) | - | 0.7 (1.7) | - | 6.4 (15.8) | - |

*Pellets per acre (ha)

**Table 10-24.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum nelsonii (Columbia needlegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex obtusata (obtuse sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leymus cinereus (basin wildrye) | Muhlenbergia asperifolia (scratchgrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | - | 4 | 2 | - | 284 | 141 | 7 | 64 | 13 | 394 | - |
| 2000 | - | - | - | - | 102 | 240 | - | 60 | - | 337 | - |
| 2015 | 2 | 2 | 17 | - | 139 | 143 | 2 | 71 | - | 324 | - |
| 2020 | - | 3 | 6 | - | 245 | 247 | 16 | 61 | - | 72 | - |
| 2025 | - | 4 | 31 | 9 | 287 | 241 | 10 | 80 | - | 45 | 3 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | - | 0.0 | 0.0 | - | 7.6 | 6.2 | 0.2 | 8.4 | 0.1 | 16.2 | - |
| 2000 | - | - | - | - | 2.1 | 20.3 | - | 7.9 | - | 18.5 | - |
| 2015 | 0.1 | 0.0 | 0.1 | - | 4.5 | 11.8 | 0.1 | 8.9 | - | 28.0 | - |
| 2020 | - | 0.1 | 0.0 | - | 8.0 | 20.6 | 0.2 | 8.7 | - | 2.1 | - |
| 2025 | - | 0.4 | 1.6 | 0.2 | 13.7 | 14.4 | 0.4 | 8.8 | - | 1.0 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-24.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Artemisia dracunculus (tarragon) | Chenopodium atrovirens[a] (pinyon goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron flagellaris (trailing fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 82 | - | - | 27 | - | 22 | 20 | 55 | - | 35 | - | 9 | - | 12 | - | - | - |
| 2000 | 66 | 5 | - | 10 | - | 35 | - | 66 | - | - | - | - | - | 10 | 12 | - | - |
| 2015 | 58 | 2 | - | 16 | - | 55 | - | 112 | 4 | 7 | 7 | 6 | 6 | 11 | 8 | - | - |
| 2020 | 39 | 4 | 7 | - | - | 40 | 27 | 156 | - | 3 | - | 16 | - | 7 | 18 | - | 3 |
| 2025 | 15 | - | 76 | 5 | 1 | 28 | 2 | 143 | 17 | 119 | - | - | - | 7 | - | 6 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 1.7 | - | - | 0.0 | - | 1.0 | 0.2 | 1.8 | - | 0.5 | - | 0.0 | - | 0.2 | - | - | - |
| 2000 | 1.5 | 0.2 | - | 0.1 | - | 2.1 | - | 2.3 | - | - | - | - | - | 0.1 | 0.1 | - | - |
| 2015 | 3.1 | 0.0 | - | 0.1 | - | 3.3 | - | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.4 | - | - |
| 2020 | 0.6 | 0.2 | 0.0 | - | - | 2.2 | 0.6 | 8.4 | - | 0.0 | - | 0.0 | - | 0.8 | 0.1 | - | 0.1 |
| 2025 | 0.4 | - | 0.9 | 0.0 | 0.0 | 1.1 | 0.0 | 7.4 | 0.1 | 1.2 | - | - | - | 0.3 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erysimum capitatum[a] (sanddune wallflower) | Geum aleppicum (yellow avens) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lupinus (lupine) | Microsteris gracilis[a] (slender phlox) | Oenothera pallida[a] (pale evening primrose) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Senecio eremophilus (desert ragwort) | Symphyotrichum (aster) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 11 | - | - | - | - | 4 | 94 | - | 27 | 167 | - | - | 39 | 105 | 10 |
| 2000 | - | - | 3 | - | - | - | - | - | 12 | 2 | - | 176 | - | - | 38 | 76 | 18 |
| 2015 | - | 41 | 18 | - | - | 13 | 3 | 7 | 4 | 5 | - | 16 | 3 | 17 | 25 | 70 | 2 |
| 2020 | - | 17 | 23 | 9 | 5 | 39 | - | 25 | - | 18 | 14 | 19 | - | 18 | 8 | 85 | 14 |
| 2025 | 2 | 4 | 96 | - | 5 | - | - | 15 | 34 | 26 | - | 5 | - | 5 | 22 | 19 | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.1 | - | - | - | - | 0.2 | 1.4 | - | 0.1 | 4.3 | - | - | 1.0 | 0.6 | 0.1 |
| 2000 | - | - | 0.0 | - | - | - | - | - | 0.1 | 0.0 | - | 3.8 | - | - | 0.9 | 0.8 | 0.3 |
| 2015 | - | 0.7 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.7 | 0.0 | 0.4 | 0.9 | 1.2 | 0.0 |
| 2020 | - | 0.1 | 0.1 | 0.3 | 0.0 | 0.5 | - | 0.1 | - | 0.3 | 0.1 | 0.6 | - | 2.0 | 0.2 | 1.7 | 0.2 |
| 2025 | 0.0 | 0.2 | 1.3 | - | 0.3 | - | - | 0.0 | 0.3 | 0.1 | - | 0.2 | - | 0.4 | 0.5 | 0.1 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Vicia americana (American vetch) |
|---|---|
| year | Nested |
| 1995 | 9 |
| 2000 | 4 |
| 2015 | - |
| 2020 | - |
| 2025 | - |
| year | Average Cover (%) |
| 1995 | 0.0 |
| 2000 | 0.0 |
| 2015 | - |
| 2020 | - |
| 2025 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-24.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Rosa woodsii[p] (Woods' rose) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 1995 | - | - | - | - |
| 2000 | - | - | - | - |
| 2015 | 0.5 | - | - | - |
| 2020 | 1 | - | - | - |
| 2025 | 2 | - | - | - |
| year | Quadrat Cover (%) | | | |
| 1995 | 6.0 | - | - | - |
| 2000 | 0.4 | - | - | - |
| 2015 | 1.7 | - | 0.0 | - |
| 2020 | 1.4 | 0.2 | 0.2 | 0.0 |
| 2025 | 1.6 | - | 0.3 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

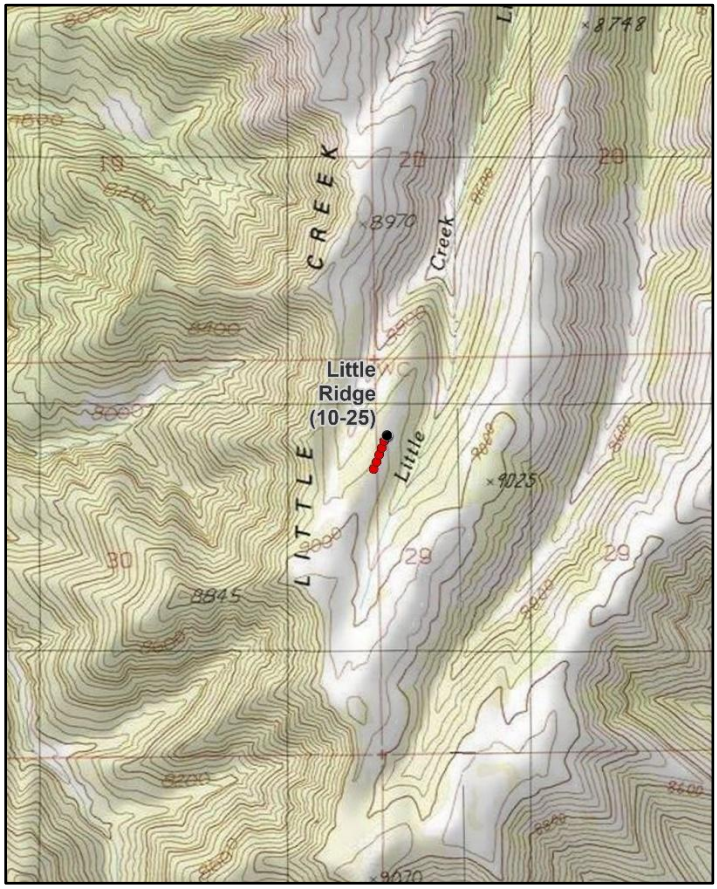
**Table 10-24.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

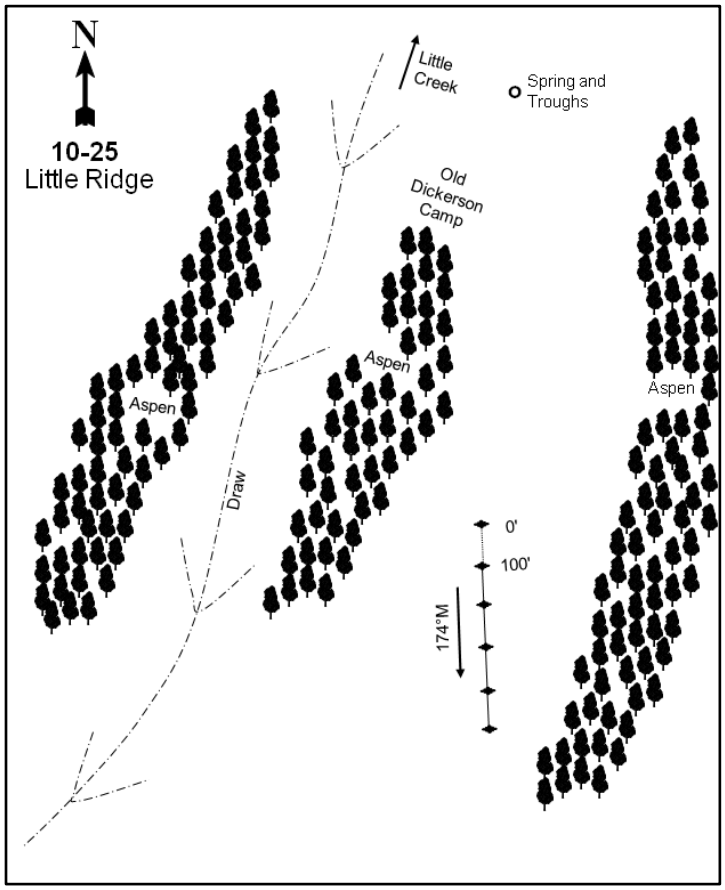
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 21940 | 1020 | 19 | 81 | 0 | 0 | 0 | 0 | 38/20 |
| 2000 | 5620 | 40 | 19 | 81 | 0 | 0 | 0 | 0 | 14/14 |
| 2015 | 6820 | 480 | 28 | 72 | 0 | 2 | 0 | 0 | 16/17 |
| 2020 | 4360 | 300 | 31 | 67 | 2 | 0 | 0 | 3 | 13/18 |
| 2025 | 2880 | 20 | 8 | 92 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 42/45 |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 83/167 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 71/138 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ribes cereum[p] -- (wax currant) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 164/244 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 200 | - | 100 | 0 | 0 | 0 | 0 | 0 | 36/21 |
| 2020 | - | - | - | - | - | - | - | - | 55/55 |
| 2025 | 160 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Sambucus nigra ssp. cerulea[p] -- (blue elderberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 93/176 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 69/105 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# LITTLE RIDGE - STUDY NO. 10-25




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Bogart Canyon NE; Township 18S, Range 21E, Section 29 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 618356 East 4342073 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 189° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | No Rebar |

## Directions to Site

From the cabin in Bogart Canyon, travel north and past the Bogart-She site (10-23) and follow She Canyon north on the trail system. Continue to follow She Canyon until Little Creek Ridge. Turn east on the trail system until on top of Little Creek Ridge and follow the trail to the study. The study is marked with a witness post and the 0-foot baseline stake is 4 ½ paces at 240 degrees magnetic from the witness post.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | BOGART |
| Elevation | 8,800ft (2,682m) |
| Aspect | North |
| Slope | 3% |
| Sample Dates | 09/13/1995, 06/30/2015, 06/16/2020, 08/12/2025 |

**Table 10-25.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Wildfire | Diamond Creek | - | 2002 | 88421 |

## Wildlife Habitat and Vegetation History

**Table 10-25.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-25.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1990 | Perennial Grass-Forb | NA |
| 1995 | Perennial Grass-Forb | NA |
| 2015 | Perennial Grass-Forb/Quaking Aspen | NA |
| 2020 | Perennial Grass-Forb/Quaking Aspen/Mountain Big Sagebrush | NA |
| 2025 | Perennial Grass-Forb/Quaking Aspen/Mountain Big Sagebrush | NA |

## Site Notes

No Notes

## Soils

**Table 10-25.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Not Defined | 6.2 | 0.0 | 0.0 | 0.0 | 4.1 | 4.0 | 111.0 | 0.2 | 05/30/2015 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 22 inches |
| NRCS Ecological Site | High Mountain Loam (Aspen) |
| NRCS Ecological Site # | R048AY506UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1990, the site was dominated by a perennial grass and forb plant community with perennial grasses providing much of the cover (Pre-1992 Data). However, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and quaking aspen (*Populus tremuloides*) have increased in cover since 1995: this may indicate an ecological transition to an immature forest type (Table 10-25.6, Table 10-25.12). The herbaceous understory has remained moderately diverse and has been dominated by the perennial grass species needle and thread (*Hesperostipa comata*), Kentucky bluegrass (*Poa pratensis*), and the perennial forb Nevada pea (*Lathyrus lanszwertii*) (Table 10-25.10, Table 10-25.11).

The diverse and abundant herbaceous understory on this site could provide good forage for summering mule deer. However, pellet transect data indicates that deer presence has been absent to low since 1995, while elk presence was moderate in 2015 and has decreased to low in 2025. Bison presence has generally remained low to moderate; bison presence was highest in 2020 (Photos, Table 10-25.9, Table 10-25.10, Table 10-25.11). On-site observations state that there was no to little utilization of grasses and light utilization (10-20%) on forbs during the most recent sample year (2025).

## Trend Summary Tables

**Table 10-25.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 2.5 | - | 0.0 | - | - | - |
| 2015 | 11.5 | - | 3.7 | 7.9 | - | 16.0 |
| 2020 | 18.1 | - | 1.6 | 19.4 | - | 13.7 |
| 2025 | 21.7 | - | 2.8 | 29.5 | - | 15.4 |

**Table 10-25.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 452 | 192 | 291 | - | 27.9 | 2.1 | 11.9 |
| 2015 | - | 476 | 124 | 317 | - | 49.2 | 1.0 | 18.4 |
| 2020 | - | 407 | 228 | 293 | - | 27.2 | 2.9 | 13.2 |
| 2025 | - | 424 | 145 | 305 | - | 35.3 | 1.0 | 15.2 |

**Table 10-25.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 11.0 | 0.1 | 63.5 | 0.7 | 1.0 | 50.1 |
| 2015 | 8.8 | - | 44.5 | 0.0 | 0.0 | 76.0 |
| 2020 | 14.7 | 0.1 | 58.0 | 0.1 | 0.7 | 58.5 |
| 2025 | 18.1 | 0.0 | 57.4 | 0.3 | 0.1 | 57.8 |

**Table 10-25.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | American Bison | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 2 | 21 | - |
| 2015 | - | 3 | 17 | - |
| 2020 | 7 | 1 | 6 | - |
| 2025 | 9 | - | 1 | 1 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2015 | 0.7 (1.8) | - | 21.5 (53.0) | - |
| 2020 | 16.7 (41.2) | 0.7 (1.7) | 19.4 (48.0) | - |
| 2025 | 14.5 (35.9) | - | 4.0 (9.9) | - |

**Table 10-25.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus marginatus (mountain brome) | Carex (sedge) | Carex phaeocephala (dunhead sedge) | Carex vallicola (valley sedge) | Elymus elymoides (squirreltail) | Elymus trachycaulus (slender wheatgrass) | Festuca idahoensis (Idaho fescue) | Festuca thurberi (Thurber's fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1995 | 71 | 33 | 8 | 83 | - | - | 9 | 11 | - | - | 328 | 24 | 28 | 243 | - |
| 2015 | 17 | 17 | 3 | - | 6 | 30 | - | 11 | - | 23 | 192 | 38 | 5 | 415 | 3 |
| 2020 | 2 | 4 | 19 | 25 | - | - | - | 8 | - | 12 | 266 | - | 11 | 185 | - |
| 2025 | 61 | 6 | 1 | 11 | - | 12 | - | - | 8 | 10 | 209 | 20 | 37 | 294 | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1995 | 1.6 | 0.5 | 0.7 | 1.6 | - | - | 0.0 | 0.2 | - | - | 17.1 | 0.2 | 0.2 | 5.7 | - |
| 2015 | 1.3 | 1.4 | 0.0 | - | 0.2 | 1.2 | - | 0.1 | - | 0.6 | 11.6 | 0.6 | 0.0 | 32.1 | 0.0 |
| 2020 | 0.0 | 0.2 | 0.9 | 0.2 | - | - | - | 0.4 | - | 0.9 | 17.6 | - | 0.0 | 7.0 | - |
| 2025 | 2.8 | 0.2 | 0.0 | 0.0 | - | 0.1 | - | - | 0.5 | 1.5 | 14.2 | 0.3 | 0.5 | 15.1 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-25.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Ambrosia psilostachya (Cuman ragweed) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria parvifolia (small-leaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Astragalus miser (timber milkvetch) | Calochortus nuttallii (sego lily) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Delphinium nuttallianum (twolobe larkspur) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Fritillaria atropurpurea (spotted fritillary) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 136 | - | - | - | - | 2 | - | 1 | 22 | 62 | 4 | 23 | - | - | 65 | 10 | - |
| 2015 | 61 | 59 | 2 | 35 | 4 | 4 | - | 14 | - | 2 | 34 | 3 | - | 46 | 4 | 52 | - |
| 2020 | 39 | 47 | - | - | 7 | 4 | - | 34 | - | 1 | 39 | - | 31 | - | 36 | 3 | - |
| 2025 | 47 | 67 | - | 2 | 8 | 8 | 2 | 1 | 2 | - | 60 | - | 4 | 6 | 17 | 30 | 1 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 2.5 | - | - | - | - | 0.0 | - | 0.0 | 0.1 | 0.7 | 0.0 | 0.1 | - | - | 0.3 | 0.1 | - |
| 2015 | 1.2 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | - | 0.1 | - | 0.0 | 0.1 | 0.0 | - | 0.1 | 0.0 | 0.8 | - |
| 2020 | 0.5 | 0.1 | - | - | 0.2 | 0.0 | - | 0.1 | - | 0.0 | 0.1 | - | 0.1 | - | 0.4 | 0.1 | - |
| 2025 | 0.3 | 0.5 | - | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.1 | - | 0.0 | 0.0 | 0.1 | 0.3 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Lappula occidentalis[a] (flatspine stickseed) | Lathyrus lanszwertii (Nevada pea) | Lepidium ramosissimum[a] (manybranched pepperweed) | Leptosiphon septentrionalis[a] (northern linanthus) | Microsteris gracilis[a] (slender phlox) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Polygonum douglasii[a] (Douglas' knotweed) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Vicia americana (American vetch) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1995 | 7 | - | 151 | 11 | - | 6 | - | - | 168 | 20 | 27 | 138 | 1 | - |
| 2015 | - | 1 | 216 | 2 | 2 | 21 | 13 | 0 | 15 | 15 | 15 | 75 | - | 53 |
| 2020 | 4 | 1 | 209 | - | - | 114 | - | - | 121 | 142 | - | 111 | 4 | 53 |
| 2025 | 13 | 1 | 262 | - | - | 77 | - | - | 30 | 46 | 9 | 3 | - | 41 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 6.5 | 0.1 | - | 0.0 | - | - | 1.7 | 0.1 | 0.6 | 1.3 | 0.0 | - |
| 2015 | - | 0.0 | 14.2 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.4 | 0.1 | 0.4 | - | 1.2 |
| 2020 | 0.0 | 0.0 | 9.7 | - | - | 0.4 | - | - | 0.5 | 1.9 | - | 1.3 | 0.0 | 0.7 |
| 2025 | 0.0 | 0.0 | 12.9 | - | - | 0.1 | - | - | 0.1 | 0.5 | 0.1 | 0.0 | - | 0.8 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-25.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Populus tremuloides[tp] (quaking aspen) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 1995 | - | - | - | - |
| 2015 | 6 | 16 | - | 1.9 |
| 2020 | 13.8 | 13.7 | - | 5.6 |
| 2025 | 21.7 | 15.4 | - | 7.8 |
| year | Quadrat Cover (%) | | | |
| 1995 | 0.5 | 0.0 | - | 2.1 |
| 2015 | 7.1 | 3.7 | 0.4 | 4.0 |
| 2020 | 13.0 | 1.6 | - | 5.0 |
| 2025 | 15.6 | 2.8 | - | 6.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-25.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 700 | 2460 | 80 | 20 | 0 | 0 | 0 | 0 | 73/92 |
| 2015 | 1400 | 340 | 40 | 60 | 0 | 1 | 0 | 0 | 63/88 |
| 2020 | 1560 | 5300 | 15 | 80 | 5 | 0 | 0 | 1 | 70/117 |
| 2025 | 4180 | 40 | 53 | 44 | 4 | 0 | 0 | 16 | - / - |
| Populus tremuloides[tp] -- (quaking aspen) | | | | | | | | | |
| 1995 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | See table 13a - Aspen Characteristics | | | | | | | | |
| 2020 | See table 13a - Aspen Characteristics | | | | | | | | |
| 2025 | See table 13a - Aspen Characteristics | | | | | | | | |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 65/44 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 280 | 20 | 29 | 71 | 0 | 43 | 0 | 0 | 43/84 |
| 2015 | 320 | 20 | 6 | 88 | 6 | 13 | 0 | 0 | 68/101 |
| 2020 | 300 | - | 13 | 87 | 0 | 0 | 0 | 0 | 70/140 |
| 2025 | 640 | 40 | 9 | 91 | 0 | 0 | 0 | 6 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-25.13a - Aspen Characteristics.** Characteristics of aspen populations including density, size class distribution, and vigor of plants.

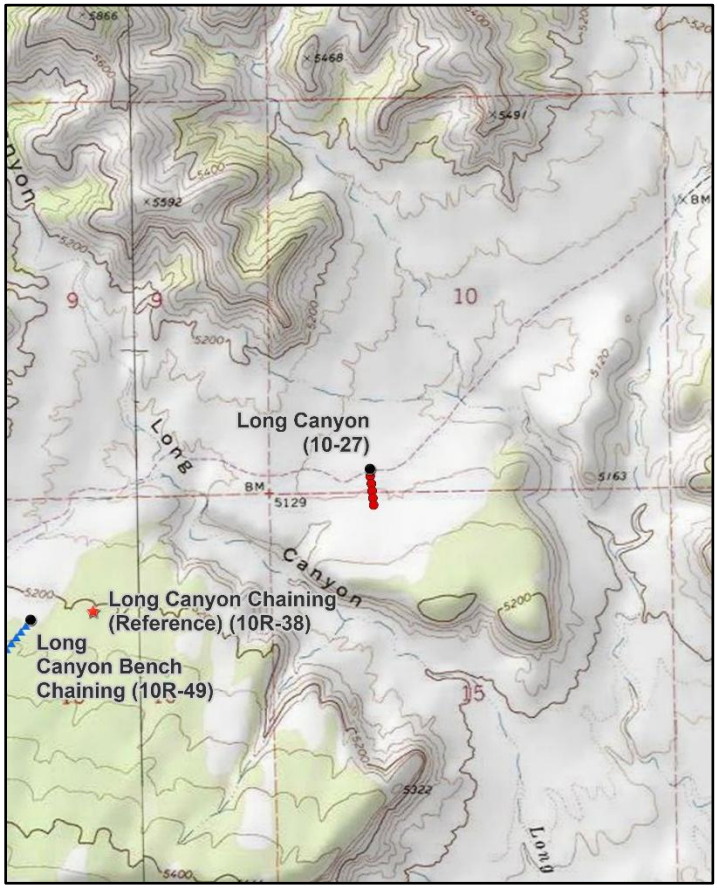
| Year | Density | Size Class Distribution | | | | Utilization | | Poor Vigor (%) |
|---|---|---|---|---|---|---|---|---|
| | Plants per Acre | Class I (%) | Class II (%) | Class III (%) | Class IV (%) | Moderate (%) | Heavy (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | | |
| 2015 | 1420 | 1 | 39 | 38 | 21 | 23 | 19 | 1 |
| 2020 | 1220 | - | 28 | 43 | 30 | 36 | 7 | 2 |
| 2025 | 920 | - | 13 | 11 | 76 | 0 | 2 | 20 |

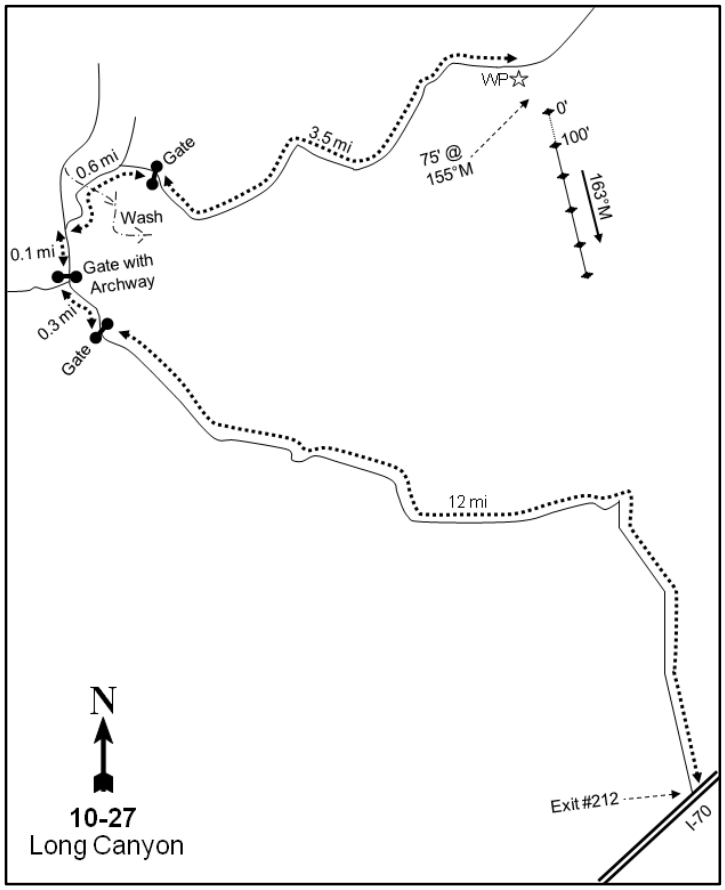
Class I - <= 1.5 feet; Class II - > 1.5 feet to 5 feet; Class III - > 5 feet and up to 1 inch diameter at breast height (dbh); Class IV - > 1 in diameter at breast height (dbh)

**Table 10-25.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | |
| 2015 | 42 | 7 | 86 | - | 7 | - | 2.5 |
| 2020 | 60 | 6 | 50 | 31 | 6 | 6 | 3.9 |
| 2025 | 57 | - | 65 | 35 | - | - | 3.5 |

# LONG CANYON - STUDY NO. 10-27




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Antone Canyon SW; Township 19S, Range 23E, Section 10 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 641287 East 4336038 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 147 |
| Transect Bearing | 163° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From I-70, take the east Cisco exit (exit #214). From the north side of the overpass, travel 12 miles to a gate. Go through the gate and proceed 0.3 miles to a sheep ranch gate with an archway. Go through the gate and continue 0.1 miles to a fork. Turn right and drive 0.6 miles to a road on the right with a gate. Turn right (south) and drive along the bench 3.5 miles to the witness post on the right (south) side of the road. From the witness post, walk 75 feet at 155 degrees magnetic to the 0-foot stake which is marked with browse tag #147.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SAN ARROYO |
| Elevation | 5,120ft (1,561m) |
| Aspect | South-Southeast |
| Slope | 4% |
| Sample Dates | 06/01/2005, 06/02/2010, 05/27/2015, 05/27/2020, 06/02/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-27.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | substantial | winter |
| Pronghorn | crucial | year-long |

**Table 10-27.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2005 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2010 | Wyoming Big Sagebrush | Early Phase I |
| 2015 | Wyoming Big Sagebrush | Early Phase I |
| 2020 | Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-27.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.3 | 47.7 | 33.7 | 18.6 | 1.0 | 9.7 | 182.4 | 0.6 | 06/01/2005 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 2005-2025 - Juniper Encroachment State: Community Phase 3.1 |

Since study establishment in 2005, this site has remained in a generally stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) as the dominant vegetation component; other shrub species have been present, but have provided much less cover (Table 10-27.12, Table 10-27.13). The herbaceous understory has remained dominated by the introduced annual grass species cheatgrass (*Bromus tectorum*) which was a co-dominant vegetation component in 2005. Forbs have been moderately diverse, but have generally remained rare (Table 10-27.10, Table 10-27.11). Utah juniper (*Juniperus osteosperma*) has been observed in all sample years, placing the site in Early Phase I of woodland succession (Photos, Table 10-27.4, Table 10-27.14). Although trees likely do not pose a threat as of 2025, there may be potential for further encroachment in future sample years.

Condition of mule deer winter range on this site has ranged between poor and good since 2005; winter range condition was considered to be poor-fair in 2025. Negative factors contributing to this poor-fair condition include reduced cover, the amount of decadence, and low recruitment within the preferred browse community; reduced perennial grass cover; the amount of annual grass cover; and a lack of perennial forb cover (Table 10-27.6, Table 10-27.7, Table 10-27.13, Table 10-27.15). Pellet transect data indicates that deer presence was high in 2005, but it has been moderate in all other sample years. During the 2024/25 winter season the area had scattered, infrequent occurrences of collared mule deer (Wildlife Migration Initiative). The presence of elk has been low to absent since 2005. Over 80% of sagebrush plants have shown signs of moderate to heavy use in 2005, 2015, and 2025, and decadence has increased over time. As such, it is reasonable to assume that sustained moderate-heavy utilization by deer in combination with other factors (climatic, etc.) has contributed to this increasing decadence within the sagebrush population (Table 10-27.9, Table 10-27.13). On-site observations for 2025 note that moderate utilization (20-40%) was evident on grass species, and little to no utilization of forb species.

## Trend Summary Tables

**Table 10-27.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2005 | 17.9 | 1.1 | - | 24.0 | 1.5 | - |
| 2010 | 18.2 | 0.6 | - | 28.2 | 0.6 | - |
| 2015 | 20.5 | 1.9 | - | 25.1 | 1.8 | - |
| 2020 | 22.6 | 2.3 | - | 26.0 | 2.0 | - |
| 2025 | 12.8 | 0.3 | - | 17.1 | 0.9 | - |

**Table 10-27.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2005 | 435 | 58 | 216 | 54 | 28.9 | 1.2 | 2.6 | 0.5 |
| 2010 | 379 | 49 | 267 | 68 | 6.0 | 1.0 | 3.0 | 1.0 |
| 2015 | 345 | 50 | 219 | 57 | 5.6 | 0.8 | 1.5 | 0.3 |
| 2020 | 303 | 81 | 255 | 78 | 6.0 | 2.3 | 2.7 | 1.1 |
| 2025 | 58 | 25 | 17 | 44 | 1.6 | 0.8 | 0.1 | 0.5 |

**Table 10-27.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2005 | 46.2 | 4.1 | 17.7 | 0.6 | 0.4 | 42.5 |
| 2010 | 43.4 | 5.0 | 30.1 | 3.1 | 0.2 | 29.8 |
| 2015 | 50.9 | 8.0 | 26.4 | 0.4 | 0.6 | 31.1 |
| 2020 | 46.4 | 13.5 | 26.1 | 1.3 | 1.1 | 31.1 |
| 2025 | 50.6 | 7.7 | 42.2 | 1.0 | 0.4 | 15.1 |

**Table 10-27.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2005 | - | 29 | 7 | 43 |
| 2010 | 3 | 27 | - | 28 |
| 2015 | 3 | 22 | 2 | 16 |
| 2020 | 2 | 20 | 2 | 25 |
| 2025 | 1 | 16 | 1 | 28 |
| Year | Days Use Per Acre (ha) | | | |
| 2005 | - | 83.1 (205.3) | 10.7 (26.5) | - |
| 2010 | 5.1 (12.6) | 21.5 (53.0) | 8.7 (21.5) | - |
| 2015 | 7.2 (17.9) | 30.2 (74.5) | 10.0 (24.8) | - |
| 2020 | 1.5 (3.6) | 26.2 (64.6) | 2.0 (5.0) | - |
| 2025 | 5.1 (12.6) | 26.8 (66.2) | - | - |

**Table 10-27.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2005 | 11 | - | 395 | 40 | - | 3 | 5 | 354 |
| 2010 | 5 | - | 375 | 40 | 4 | - | - | 41 |
| 2015 | 9 | - | 329 | 38 | 1 | 4 | - | 106 |
| 2020 | 16 | - | 274 | 57 | 1 | 3 | 5 | 85 |
| 2025 | 13 | 1 | 57 | 11 | - | - | - | 3 |
| year | Average Cover (%) | | | | | | | |
| 2005 | 0.3 | - | 20.2 | 0.7 | - | 0.1 | 0.1 | 8.7 |
| 2010 | 0.2 | - | 6.0 | 0.8 | 0.0 | - | - | 0.1 |
| 2015 | 0.2 | - | 5.3 | 0.6 | 0.0 | 0.0 | - | 0.3 |
| 2020 | 0.2 | - | 5.6 | 1.9 | 0.0 | 0.2 | 0.0 | 0.4 |
| 2025 | 0.1 | 0.0 | 1.6 | 0.8 | - | - | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-27.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Calochortus nuttallii (sego lily) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron (fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Mentzelia[a] (blazingstar) | Orobanche (broomrape) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Sphaeralcea coccinea (scarlet globemallow) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2005 | 61 | - | - | 8 | 111 | - | - | - | 52 | - | 37 | 5 | 1 | - | 22 | 61 | 23 |
| 2010 | 227 | 5 | 4 | 12 | 2 | 2 | - | 9 | 24 | 1 | 52 | 31 | 21 | - | 46 | 2 | 8 |
| 2015 | 185 | - | 3 | - | 12 | - | 12 | - | 1 | - | 12 | 28 | - | 2 | 40 | 34 | 11 |
| 2020 | 250 | - | - | - | - | - | 18 | - | - | - | 4 | 4 | - | - | 46 | 16 | 13 |
| 2025 | 13 | - | - | - | - | - | - | - | - | - | - | 4 | - | - | 42 | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2005 | 0.5 | - | - | 0.2 | 0.9 | - | - | - | 0.3 | - | 0.3 | 0.2 | 0.0 | - | 0.1 | 0.5 | 0.2 |
| 2010 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.2 | 0.4 | 0.1 | - | 0.8 | 0.0 | 0.2 |
| 2015 | 1.1 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.1 | 0.1 | - | 0.0 | 0.2 | 0.1 | 0.1 |
| 2020 | 2.6 | - | - | - | - | - | 0.2 | - | - | - | 0.0 | 0.0 | - | - | 0.8 | 0.0 | 0.2 |
| 2025 | 0.1 | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | 0.4 | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Symphyotrichum (aster) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|
| year | Nested | |
| 2005 | - | 2 |
| 2010 | - | - |
| 2015 | 1 | - |
| 2020 | - | 1 |
| 2025 | - | - |
| year | Average Cover (%) | |
| 2005 | - | 0.0 |
| 2010 | - | - |
| 2015 | 0.0 | - |
| 2020 | - | 0.0 |
| 2025 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-27.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 2005 | 22.7 | 1.2 | - | 0.1 | 0.6 | 0.9 |
| 2010 | 27.9 | 0.3 | - | - | 0 | 0.6 |
| 2015 | 25.1 | 0 | - | - | 0.7 | 1.1 |
| 2020 | 25.8 | 0.2 | - | - | 0.9 | 1.1 |
| 2025 | 16.8 | 0.3 | - | - | 0.3 | 0.6 |
| year | Quadrat Cover (%) | | | | | |
| 2005 | 17.6 | 0.1 | - | 0.1 | 0.2 | 0.9 |
| 2010 | 18.1 | 0.0 | 0.1 | - | 0.0 | 0.5 |
| 2015 | 20.5 | 0.0 | - | - | 0.3 | 1.6 |
| 2020 | 22.6 | 0.0 | - | - | 1.1 | 1.2 |
| 2025 | 12.8 | 0.0 | - | - | 0.1 | 0.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-27.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2005 | 3700 | 40 | 6 | 64 | 30 | 43 | 50 | 17 | 67/109 |
| 2010 | 4700 | 28460 | 25 | 63 | 12 | 19 | 42 | 7 | 58/96 |
| 2015 | 3840 | - | 3 | 70 | 28 | 26 | 58 | 29 | 52/89 |
| 2020 | 3480 | 20 | 3 | 43 | 53 | 18 | 0 | 66 | 61/108 |
| 2025 | 2740 | - | 2 | 54 | 45 | 42 | 41 | 50 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 2005 | 120 | - | 0 | 67 | 33 | 50 | 17 | 17 | 73/77 |
| 2010 | 40 | - | 0 | 50 | 50 | 0 | 50 | 50 | 48/71 |
| 2015 | 40 | - | 0 | 0 | 100 | 0 | 0 | 100 | 65/66 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 56/66 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 2005 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 32/34 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/35 |
| 2015 | - | - | - | - | - | - | - | - | 25/39 |
| 2020 | - | - | - | - | - | - | - | - | 20/35 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Echinocactus -- (echinocactus) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 18/30 |
| 2015 | - | - | - | - | - | - | - | - | 18/32 |
| 2020 | - | - | - | - | - | - | - | - | 22/35 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 2005 | 40 | - | 0 | 50 | 50 | 100 | 0 | 50 | 48/74 |
| 2010 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 60/73 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 49/77 |
| 2020 | 100 | - | 0 | 80 | 20 | 20 | 0 | 20 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2005 | 280 | - | 7 | 93 | 0 | 0 | 0 | 0 | 29/30 |
| 2010 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/25 |
| 2015 | 2200 | 20 | 48 | 52 | 0 | 25 | 1 | 0 | 20/19 |
| 2020 | 1700 | 20 | 31 | 68 | 1 | 0 | 0 | 1 | 20/25 |
| 2025 | 280 | - | 7 | 93 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 45/37 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 72/121 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2005 | 460 | - | 0 | 70 | 30 | 0 | 0 | 13 | 17/82 |
| 2010 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/91 |
| 2015 | 400 | - | 0 | 95 | 5 | 25 | 5 | 30 | 14/51 |
| 2020 | 260 | - | 0 | 54 | 46 | 0 | 0 | 62 | 14/87 |
| 2025 | 620 | - | 0 | 77 | 23 | 0 | 0 | 45 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | 15/23 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

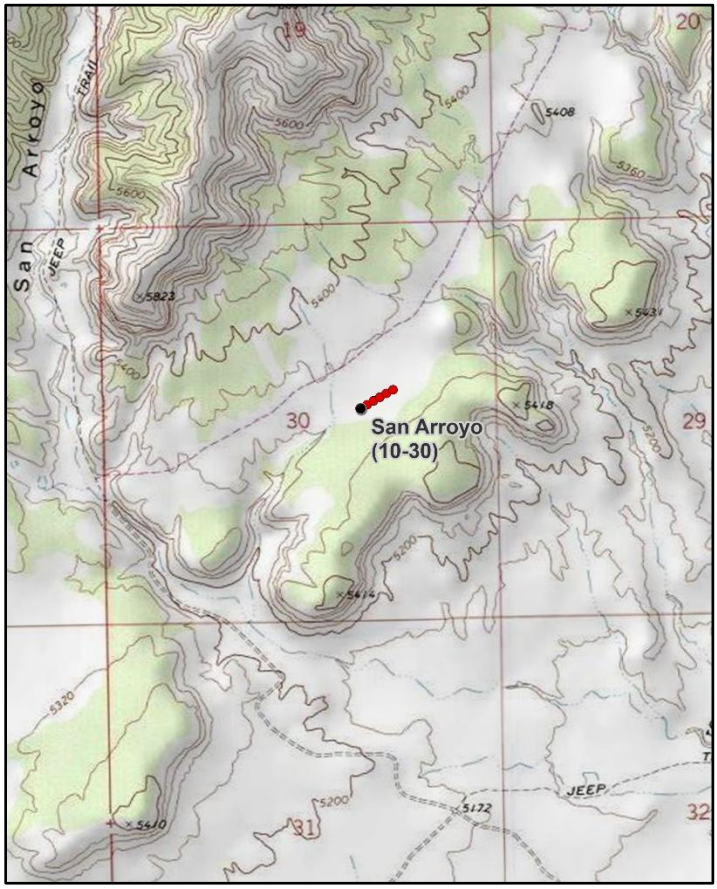
**Table 10-27.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

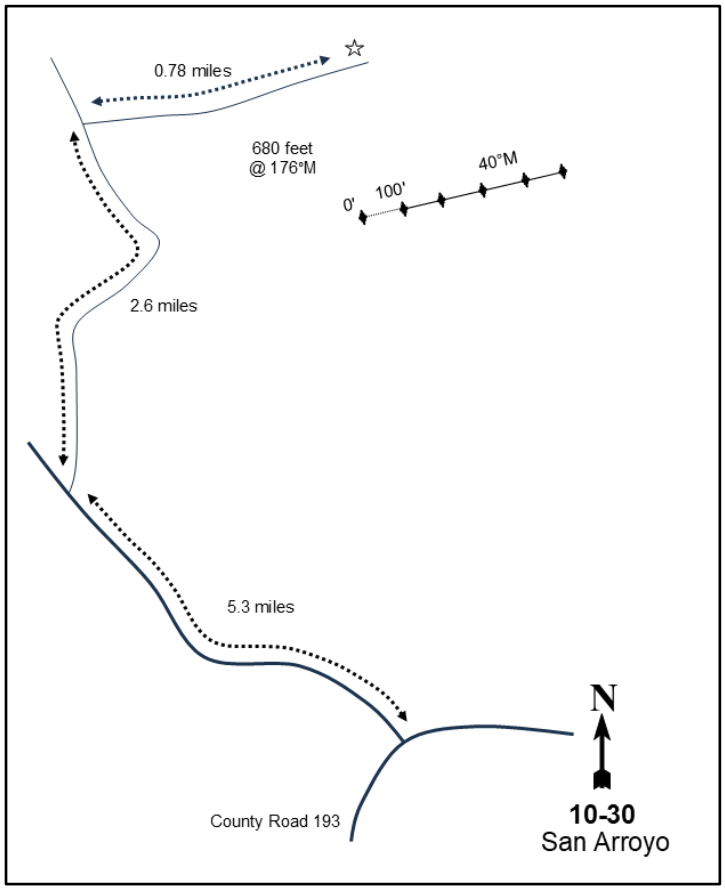
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 1 | - | 100 | - | - | - | 3.0 |
| 2025 | 1 | - | 100 | - | - | - | 4.0 |

**Table 10-27.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | 30.0 | 6.1 | 2.8 | 2.5 | -20.0 | 1.0 | 0.0 | **22.4** | Poor |
| 2010 | 30.0 | 11.3 | 12.4 | 2.1 | -4.5 | 2.0 | 0.0 | **53.3** | Good |
| 2015 | 30.0 | 6.7 | 1.3 | 1.6 | -4.2 | 0.7 | 0.0 | **36.1** | Fair |
| 2020 | 30.0 | -1.1 | 1.7 | 4.7 | -4.5 | 2.3 | 0.0 | **33.1** | Fair |
| 2025 | 21.4 | 1.9 | 0.7 | 1.6 | -1.2 | 0.9 | 0.0 | **25.3** | Poor-Fair |

# SAN ARROYO - STUDY NO. 10-30




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Bryson Canyon SW; Township 17S, Range 25E, Section 30 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 656180 East 4351609 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 40° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From the intersection of U.S. Highway 6 and the Book Cliff Ridge Road, travel north 5.3 miles on Book Cliff Ridge Road to an intersection. Turn right on to Bryson Canyon Road and travel north for another 2.6 miles to another intersection. Stay left and travel along Bryson Ridge Road for another 1.45 miles to an intersection. Turn right (east) and drive 0.44 miles to where the road intersects with the San Arroyo Wash. Turn right on to Bryson Wash, travel 0.05 miles, and turn right again. Travel for another 0.67 miles to a faint road following a bend in the road. Drive down the faint road to a sagebrush opening. Park here; there is no witness post. Navigate to the 0-foot baseline stake using GPS; approximately 680 feet away at 176 degrees magnetic.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SAN ARROYO |
| Elevation | 5,341ft (1,628m) |
| Aspect | Northwest |
| Slope | 5% |
| Sample Dates | 05/27/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-30.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | substantial | year-long |
| Pronghorn | crucial | year-long |

**Table 10-30.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2025 | Wyoming Big Sagebrush | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 10-30.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 8.2 | 49.9 | 36.9 | 13.3 | 1.0 | 11.0 | 158.0 | 0.3 | 06/17/2025 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 2025 - Current Potential State: Community Phase 2.4 |

The plant community on this site existed as a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) stand upon study establishment in 2025. Although the sagebrush population was mainly comprised of mature individuals, there was a moderate amount (35% of plants sampled in density strips) of decadence within the community (Table 10-30.12, Table 10-30.13). The herbaceous understory was depauperate in both abundance and diversity, with the introduced annual grass species cheatgrass (*Bromus tectorum*) providing a vast majority of the herbaceous cover. Although cheatgrass cover was moderate in 2025 (Table 10-30.7, Table 10-30.10, Table 10-30.11), its presence could pose a threat to the resistance and resilience of the community should a disturbance occur in the future.

Condition of deer winter range on this site was considered to be fair in 2025. Factors negatively affecting this condition include decadence and a lack of recruitment of young within the preferred browse community; a lack of perennial grass and forb cover; and the presence of annual grass (Table 10-30.7, Table 10-30.13, Table 10-30.15). According to average pellet group data, deer presence was moderate and elk presence was low in 2025 (Table 10-30.9). During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife Migration Initiative). Sixty-three percent of Wyoming big sagebrush plants sampled in density strips were moderately to heavily hedged at the outset of the study period (Table 10-30.13). On-site observations for 2025 note little to no utilization on the herbaceous community.

## Trend Summary Tables

**Table 10-30.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2025 | 15.6 | - | - | 23.3 | - | - |

**Table 10-30.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2025 | 238 | 9 | 2 | - | 5.1 | 0.1 | 0.0 | - |

**Table 10-30.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2025 | 27.6 | 6.2 | 61.3 | 1.6 | 0.2 | 20.5 |

**Table 10-30.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2025 | - | 34 | - | 42 |
| Year | Days Use Per Acre (ha) | | | |
| 2025 | 1.5 (3.6) | 34.2 (84.4) | 5.3 (13.2) | - |

**Table 10-30.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|
| year | Nested Frequency | | |
| 2025 | 238 | 9 | 3 |
| year | Average Cover (%) | | |
| 2025 | 5.1 | 0.1 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-30.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Lappula occidentalis[a] (flatspine stickseed) |
|---|---|
| year | Nested |
| 2025 | 2 |
| year | Average Cover (%) |
| 2025 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-30.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) |
|---|---|
| year | Line |
| 2025 | 23.3 |
| year | Quadrat Cover (%) |
| 2025 | 15.6 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-30.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

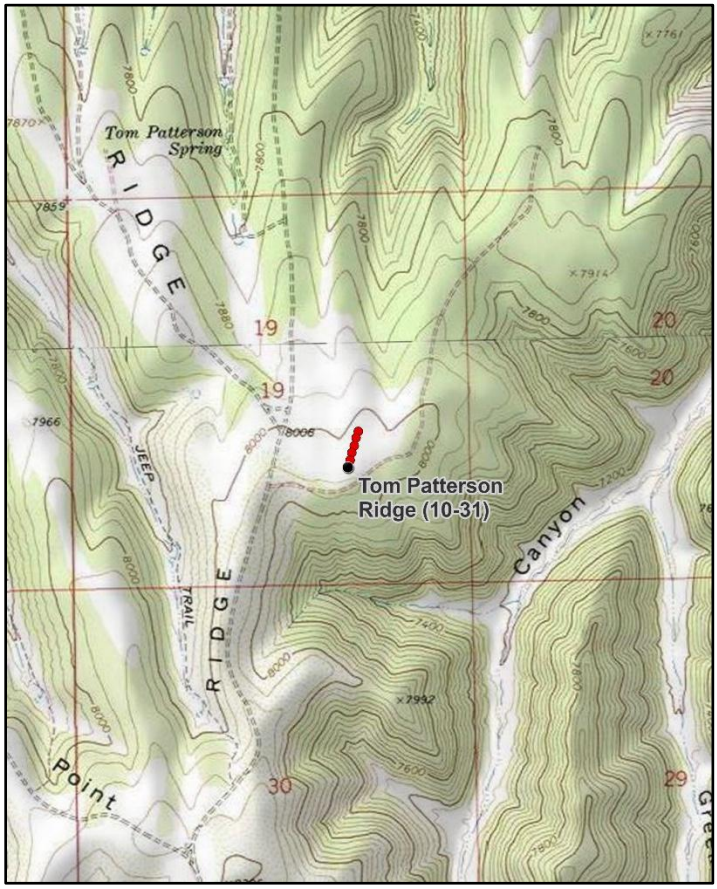
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2025 | 4040 | - | 1 | 65 | 35 | 35 | 28 | 41 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |

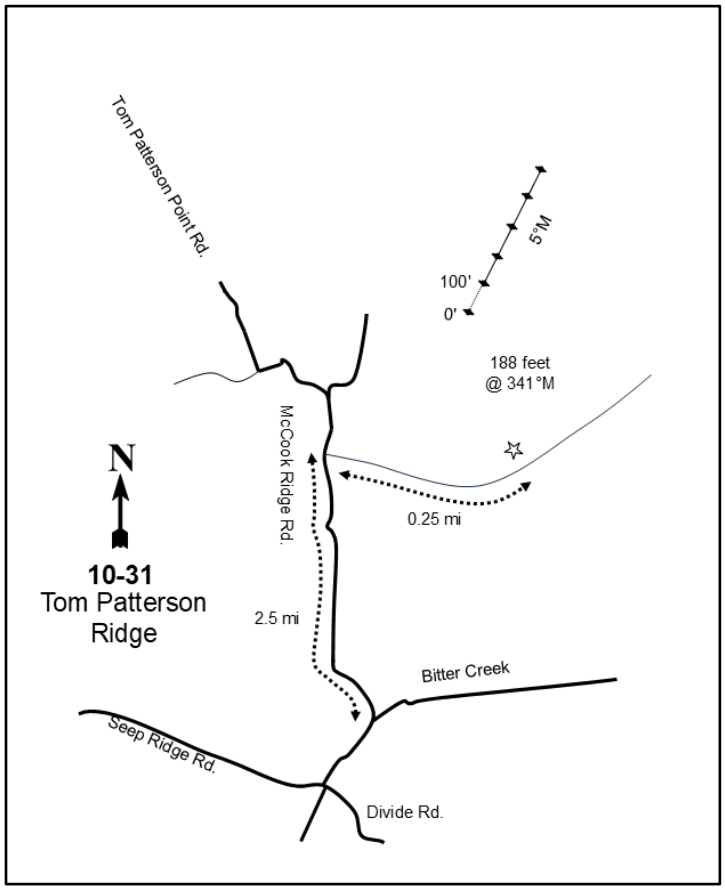
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-30.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2025 | 29.1 | 4.6 | 0.3 | 0.2 | -3.9 | 0.0 | 0.0 | **30.3** | Fair |

# TOM PATTERSON RIDGE - STUDY NO. 10-31




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | San Arroyo Ridge NE; Township 15S, Range 25E, Section 19 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 658481 East 4373379 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 5° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection at Tom Patterson Ridge and Bookcliff Ridge Road, travel north on Tom Patterson Ridge Road for 2.5 miles to a "Y" intersection at Tom Patterson Point. Stay to the right along McCook Ridge. Continue along McCook Ridge Road for 1 mile to a faint road and turn right. Drive along this road for 0.25 miles. Park here; there is no witness post. The transect is found on the north side of the road. Use GPS to navigate to the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SWEET WATER |
| Elevation | 8,028ft (2,447m) |
| Aspect | Northwest |
| Slope | 2-5% |
| Sample Dates | 08/06/2025 |

**Table 10-31.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Imazapic | Tom Patterson Herbicide | 5913 | August 2022 | 2297 |

## Wildlife Habitat and Vegetation History

**Table 10-31.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10-31.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2025 | Mixed Shrub | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-31.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.6 | 43.7 | 40.9 | 15.4 | 3.8 | 7.0 | 206.0 | 0.5 | 08/25/2025 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Loam (Browse) |
| NRCS Ecological Site # | R048AY406UT |
| States and Transitions | 2025 - Current Potential State: Community Phase 2.1 |

Upon study establishment in 2025, the plant community on this site was dominated by a mixed mountain brush community comprised of species such as wild crab apple (*Peraphyllum ramosissimum*), alderleaf mountain mahogany (*Cercocarpus montanus*), and mountain snowberry (*Symphoricarpos oreophilus*), among others. However, a majority of the browse species sampled in density strips were considered to have poor vigor, which can likely be attributed in part to drought conditions. Utah and Rocky Mountain juniper (*Juniperus osteosperma* and *J. scopulorum*) were present, and the site was considered to be within Early Phase I of woodland succession (Table 10-31.4, Table 10-31.12, Table 10-31.13, Table 10-31.14). The herbaceous understory was diverse and abundant, with the native perennial grass species needle and thread (*Hesperostipa comata*) providing the most cover of any single herbaceous species (Table 10-31.7, Table 10-31.10, Table 10-31.11).

The diverse and abundant herbaceous understory and woody overstory on this site could provide good forage for summering mule deer. However, pellet transect data indicates that deer and bison and/or cattle presence were considered low, while elk presence was moderate in 2025. During the 2024/25 winter season the area had few occurrences of collared elk (Wildlife Migration Initiative). On-site observations state that there was little to no utilization of grasses and light utilization (10-20%) of perennial forbs during the most recent sample year (2025). In addition, production does not appear to have been adversely affected by utilization but more by drought (Photos, Table 10-31.9, Table 10-31.10, Table 10-31.11).

## Trend Summary Tables

**Table 10-31.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2025 | 51.7 | 3.0 | 0.7 | 60.0 | 3.0 | 1.0 |

**Table 10-31.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2025 | - | 335 | 8 | 271 | - | 16.9 | 0.1 | 5.6 |

**Table 10-31.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2025 | 12.5 | 0.9 | 55.3 | 5.5 | 1.3 | 55.6 |

**Table 10-31.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2025 | - | 12 | 16 | 17 |
| Year | Days Use Per Acre (ha) | | | |
| 2025 | 11.6 (28.7) | 18.7 (46.3) | 34.2 (84.4) | - |

**Table 10-31.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 2025 | 1 | 3 | 106 | 6 | 61 | 249 | 3 | 30 | 2 | 4 | 3 |
| year | Average Cover (%) | | | | | | | | | | |
| 2025 | 0.0 | 0.0 | 3.4 | 0.1 | 0.7 | 12.1 | 0.0 | 0.5 | 0.0 | 0.0 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-31.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium cernuum (nodding onion) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arenaria congesta (ballhead sandwort) | Astragalus miser (timber milkvetch) | Astragalus spatulatus (tufted milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Castilleja linariifolia (Wyoming Indian paintbrush) | Comandra umbellata (bastard toadflax) | Crepis intermedia (limestone hawksbeard) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Linum lewisii (Lewis flax) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2025 | 1 | 4 | 23 | 35 | 5 | 104 | 1 | 3 | 3 | 5 | 10 | 14 | 34 | 3 | 12 | 38 | 5 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2025 | 0.0 | 0.0 | 0.1 | 1.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.4 | 0.0 | 0.1 | 0.8 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lithospermum incisum (narrowleaf stoneseed) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon watsonii (Watson's penstemon) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Senecio integerrimus[a] (lambstongue ragwort) | Tetraneuris acaulis (stemless four-nerve daisy) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2025 | 2 | 6 | 2 | 62 | 4 | 150 | 8 | 18 |
| year | Average Cover (%) | | | | | | | |
| 2025 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.9 | 0.1 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-31.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Mahonia repens (creeping barberry) | Peraphyllum ramosissimum[p] (wild crab apple) | Pseudotsuga menziesii[t] (Douglas-fir) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | |
| 2025 | 5.7 | 4.9 | 13.6 | 1.5 | 2.2 | 0.5 | 0.7 | 0.1 | 24.8 | 0.3 | 0.1 | 0.3 | 9.1 | 0.2 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | |
| 2025 | 4.7 | 4.0 | 13.1 | 3.5 | 2.1 | 0.7 | 0.6 | 0.1 | 17.7 | 0.0 | 0.0 | 0.4 | 8.4 | 0.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-31.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

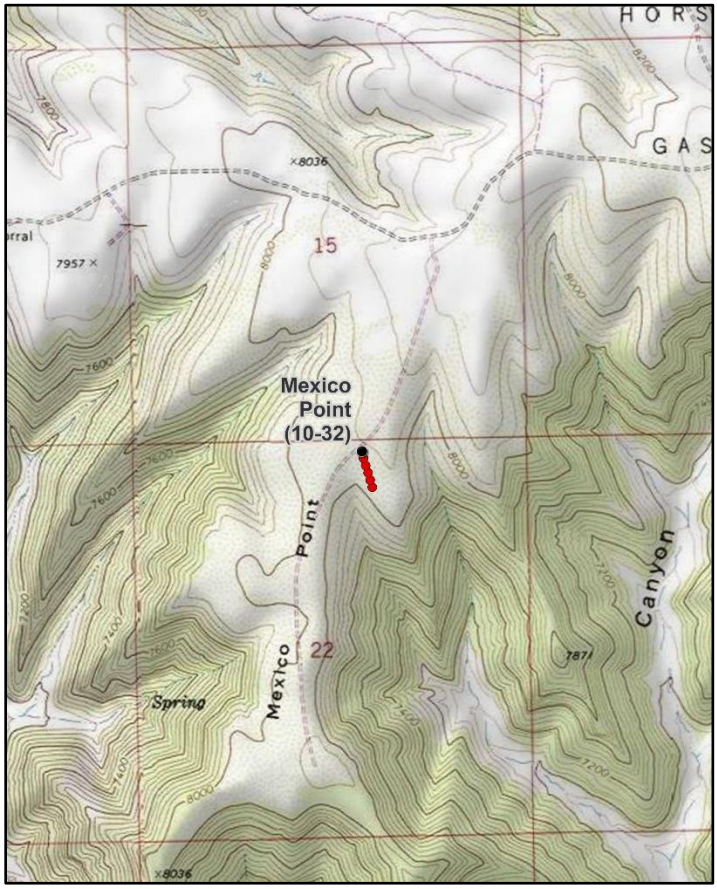
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2025 | 600 | - | 27 | 67 | 7 | 13 | 33 | 83 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2025 | 1900 | - | 11 | 50 | 40 | 15 | 18 | 67 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2025 | 2160 | 580 | 19 | 74 | 7 | 53 | 38 | 91 | - / - |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 2025 | 5280 | - | 1 | 99 | 0 | 13 | 77 | 73 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2025 | 1100 | - | 2 | 89 | 9 | 16 | 0 | 86 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2025 | 1880 | - | 13 | 87 | 0 | 0 | 0 | 3 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 2025 | 440 | - | 0 | 100 | 0 | 0 | 0 | 64 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 2025 | 60 | - | 0 | 100 | 0 | 33 | 0 | 33 | - / - |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 2025 | 2440 | - | 7 | 93 | 0 | 38 | 25 | 98 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 2025 | - | - | - | - | - | - | - | - | - / - |
| Pseudotsuga menziesii[t] -- (Douglas-fir) | | | | | | | | | |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2025 | 40 | 100 | 0 | 100 | 0 | 50 | 50 | 0 | - / - |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 2025 | 80 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2025 | 4000 | - | 5 | 96 | 0 | 19 | 15 | 71 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2025 | 500 | - | 4 | 96 | 0 | 20 | 48 | 8 | - / - |

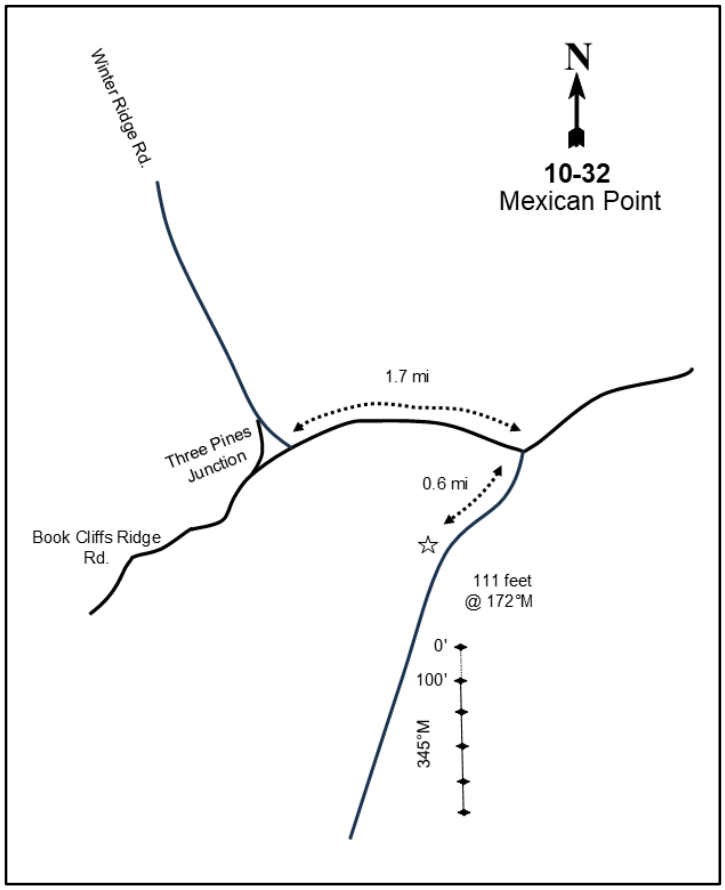
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-31.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2025 | 2 | - | 100 | - | - | - | 3.0 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 22 | - | 25 | 42 | 17 | 17 | 11.9 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2025 | 12 | 20 | 20 | - | 20 | 40 | 12.2 |

# MEXICO POINT - STUDY NO. 10-32




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | P R Spring SW; Township 16S, Range 23E, Section 22 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 640759 East 4363342 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 160° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of Seep Ridge Road and Book Cliff Ridge Road, drive west along Book Cliff Ridge Road for 7.3 miles to an intersection at Mexico Point. Turn left (south), drive for 0.6 miles, and find the nearest parking area near the transect. Using GPS to navigate, walk 117 feet to the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | BOOKCLIFFS PASTURE |
| Elevation | 8,034ft (2,449m) |
| Aspect | South |
| Slope | 3-8% |
| Sample Dates | 08/06/2025 |

**Table 10-32.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Prescribed | Bookcliffs Mountain Browse Prescribed Fire 1999 | LTDL 1316-3716 | October 1999 | 523 |

## Wildlife Habitat and Vegetation History

**Table 10-32.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | year-long |

**Table 10-32.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2025 | Mixed Shrub | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 10-32.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.3 | 33.9 | 44.9 | 21.3 | 4.3 | 8.0 | 227.0 | 0.5 | 08/25/2025 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | R048AY406UT |
| States and Transitions | 2025 - Reference State: Community Phase 1.1 |

Upon study establishment in 2025, the plant community on this site was dominated by a mixture of browse species including Utah serviceberry (*Amelanchier utahensis*), mountain snowberry (*Symphoricarpos oreophilus*), and wild crab apple (*Peraphyllum ramosissimum*), among others. Cover of preferred browse was high in 2025, but many species exhibited notable amounts of poor vigor, which can likely be attributed in part to drought conditions (Table 10-32.12, Table 10-32.13). The herbaceous understory provided moderate cover and was moderately diverse; native perennial grasses such as needle and thread (*Hesperostipa comata*), Ross' sedge (*Carex rossii*), and Indian ricegrass (*Achnatherum hymenoides*) were the dominant herbaceous component (Table 10-32.7, Table 10-32.10, Table 10-32.11).

The moderately diverse and abundant herbaceous understory and woody overstory on this site could provide good forage for summering mule deer. Pellet transect data indicates that deer and elk presence was moderate in 2025, while bison and/or cattle presence was considered low. On-site observations state that there was moderate utilization (20-40%) of the grass community during the most recent sample year (2025). However, the understory does not appear to have been adversely affected by utilization but more by drought (Photos, Table 10-32.9, Table 10-32.10, Table 10-32.11).

## Trend Summary Tables

**Table 10-32.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2025 | 45.7 | 0.5 | - | 63.9 | 0.4 | - |

**Table 10-32.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2025 | - | 279 | 7 | 182 | - | 7.0 | 0.0 | 3.7 |

**Table 10-32.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2025 | 26.1 | 0.0 | 52.7 | 1.0 | 2.1 | 47.1 |

**Table 10-32.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle/Bison | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2025 | 7 | 10 | 21 | 7 |
| Year | Days Use Per Acre (ha) | | | |
| 2025 | 10.9 (26.9) | 23.4 (57.9) | 36.8 (91.0) | - |

**Table 10-32.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 2025 | 36 | 21 | 47 | 104 | 93 | 48 | 3 |
| year | Average Cover (%) | | | | | | |
| 2025 | 1.3 | 0.2 | 1.3 | 0.8 | 2.2 | 1.2 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-32.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arenaria congesta (ballhead sandwort) | Astragalus miser (timber milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis intermedia (limestone hawksbeard) | Erigeron eatonii (Eaton's fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Penstemon caespitosus (mat penstemon) | Penstemon watsonii (Watson's penstemon) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 2025 | 3 | 17 | 5 | 87 | 4 | 11 | 3 | 58 | 8 | 6 | 8 | 75 |
| year | Average Cover (%) | | | | | | | | | | | |
| 2025 | 0.0 | 0.2 | 0.0 | 2.8 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.1 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-32.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Opuntia fragilis (brittle pricklypear) | Peraphyllum ramosissimum[p] (wild crab apple) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 2025 | 19.1 | 3.3 | 3.7 | 0.4 | - | 14 | 0.1 | 9.2 | 14.5 |
| year | Quadrat Cover (%) | | | | | | | | |
| 2025 | 13.0 | 3.9 | 3.2 | 0.3 | 0.1 | 11.0 | 0.4 | 6.9 | 7.4 |

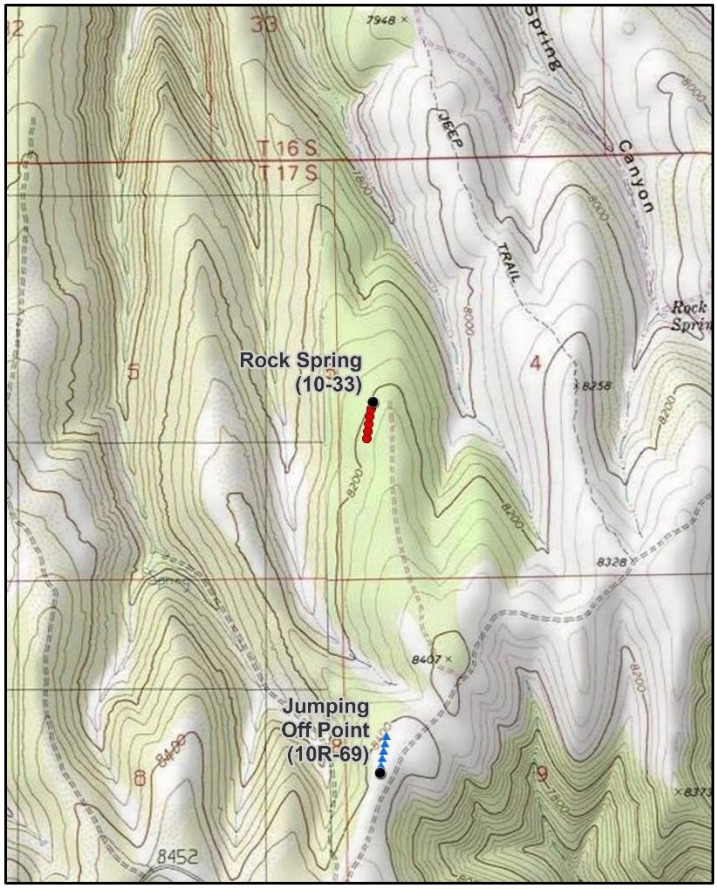
t - Tree Species; p - Preferred Browse; i - Introduced Species

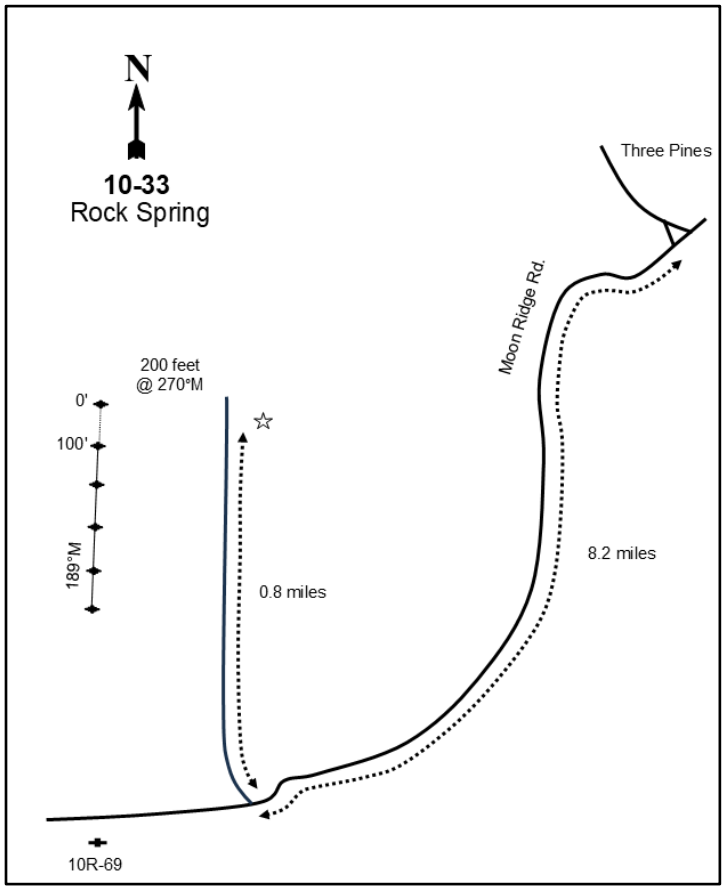
**Table 10-32.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2025 | 1360 | - | 0 | 94 | 6 | 15 | 74 | 79 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2025 | 1780 | 40 | 17 | 78 | 6 | 49 | 7 | 46 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2025 | 820 | - | 17 | 81 | 2 | 42 | 42 | 81 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2025 | 300 | - | 0 | 80 | 20 | 60 | 7 | 100 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 2025 | 200 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 2025 | 1020 | 20 | 4 | 90 | 6 | 16 | 41 | 98 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2025 | 180 | - | 11 | 89 | 0 | 33 | 67 | 33 | - / - |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 2025 | 1280 | - | 5 | 94 | 2 | 5 | 53 | 2 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2025 | 4560 | - | 2 | 97 | 1 | 24 | 16 | 65 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# ROCK SPRING - STUDY NO. 10-33




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Preacher Canyon NW; Township 17S, Range 22E, Section 04 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 629382 East 4357370 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 189° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of Book Cliff Ridge Road, Winter Ridge Road, and Moon Ridge Road, drive west along Moon Ridge Road for 8.2 miles to an intersection. Turn right (north) and travel 0.81 miles to the first available place to park. Using a GPS, walk approximately 200 feet to the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | MCCLELLAND |
| Elevation | 8,202ft (2,500m) |
| Aspect | West |
| Slope | 10-15% |
| Sample Dates | 08/04/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-33.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-33.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2025 | Mixed Shrub | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-33.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.3 | 56.0 | 32.7 | 11.3 | 4.0 | 10.0 | 194.0 | 0.5 | 08/25/2025 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Shallow Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

The plant community on this site was dominated by a mixture of browse species when the study was established in 2025, including (but not limited to) alderleaf mountain mahogany (*Cercocarpus montanus*), Utah serviceberry (*Amelanchier utahensis*), and mountain snowberry (*Symphoricarpos oreophilus*). Although preferred browse cover was notable, a high amount of poor vigor was observed for many species (Table 10-33.12, Table 10-33.13): this can likely be in part attributed to drought conditions in 2025. Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) were observed in low amounts in point-quarter density measurements, placing the site in Early Phase I of woodland succession (Table 10-33.4, Table 10-33.14). The herbaceous understory was moderately diverse, with perennial grass species such as thickspike wheatgrass (*Elymus lanceolatus*) and Indian ricegrass (*Achnatherum hymenoides*) providing most of the understory cover (Table 10-33.7, Table 10-33.10). Perennial forbs provided little cover in comparison with perennial grasses (Table 10-33.11).

The moderately diverse and abundant herbaceous understory and woody overstory on this site could provide good forage for summering mule deer. Pellet transect data indicates that deer and elk presence was moderate in 2025. During the 2024/25 winter season the area had few occurrences of collared elk (Wildlife Migration Initiative). Bison and/or cattle presence was considered low in the same year. On-site observations state that there was light utilization of the grass community during the most recent sample year (2025), and the understory does not appear to have been adversely affected by utilization but more by drought (Photos, Table 10-33.9, Table 10-33.10, Table 10-33.11).

## Trend Summary Tables

**Table 10-33.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2025 | 29.5 | 5.2 | 0.1 | 41.1 | 3.6 | 1.1 |

**Table 10-33.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2025 | - | 270 | 3 | 146 | - | 10.8 | 0.0 | 1.2 |

**Table 10-33.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2025 | 14.1 | 0.2 | 43.2 | 23.7 | 0.7 | 40.0 |

**Table 10-33.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle/Bison | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2025 | 2 | 10 | 16 | 13 |
| Year | Days Use Per Acre (ha) | | | |
| 2025 | 2.2 (5.4) | 26.8 (66.2) | 32.2 (79.5) | - |

**Table 10-33.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lancolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2025 | 103 | 5 | 28 | 2 | 158 | 4 | 2 | 33 |
| year | Average Cover (%) | | | | | | | |
| 2025 | 3.7 | 0.3 | 0.7 | 0.0 | 4.5 | 0.4 | 0.1 | 1.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-33.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium acuminatum (tapertip onion) | Alyssum desertorum[ai] (desert madwort) | Astragalus purshii (woollypod milkvetch) | Cryptantha humilis (roundspike cryptantha) | Erigeron eatonii (Eaton's fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Machaeranthera grindelioides (rayless tansyaster) | Penstemon caespitosus (mat penstemon) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 2025 | 0 | 3 | 3 | 10 | 7 | 16 | 1 | 11 | 130 |
| year | Average Cover (%) | | | | | | | | |
| 2025 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.1 | 0.0 | 0.1 | 0.6 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-33.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Opuntia fragilis (brittle pricklypear) | Opuntia polyacantha (plains pricklypear) | Pseudotsuga menziesii[t] (Douglas-fir) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | |
| 2025 | 10.6 | 3.6 | 18.9 | 1.6 | 0.3 | 1.3 | 0.4 | - | 1.1 | 0.5 | 0.4 | 7.1 | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | |
| 2025 | 4.8 | 2.1 | 15.6 | 2.4 | 0.7 | 1.3 | 0.5 | 0.1 | 0.1 | 0.2 | 0.6 | 6.2 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-33.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

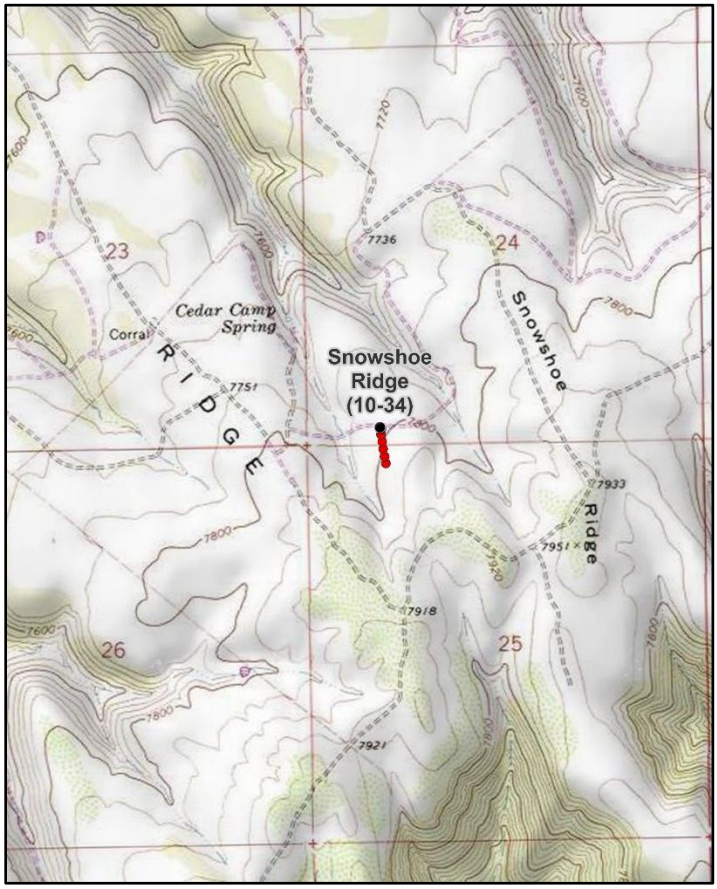
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2025 | 1280 | 20 | 8 | 66 | 27 | 5 | 86 | 86 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2025 | 1080 | - | 6 | 57 | 37 | 22 | 61 | 69 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2025 | 2520 | 40 | 7 | 72 | 21 | 12 | 87 | 67 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2025 | 2340 | 20 | 9 | 60 | 32 | 19 | 9 | 90 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2025 | 660 | - | 6 | 94 | 0 | 0 | 0 | 9 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 2025 | 3920 | 360 | 0 | 94 | 6 | 0 | 0 | 72 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 2025 | 2060 | - | 3 | 56 | 41 | 0 | 0 | 93 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2025 | 80 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2025 | 260 | - | 15 | 54 | 31 | 8 | 85 | 39 | - / - |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2025 | 3520 | - | 3 | 94 | 3 | 29 | 24 | 67 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

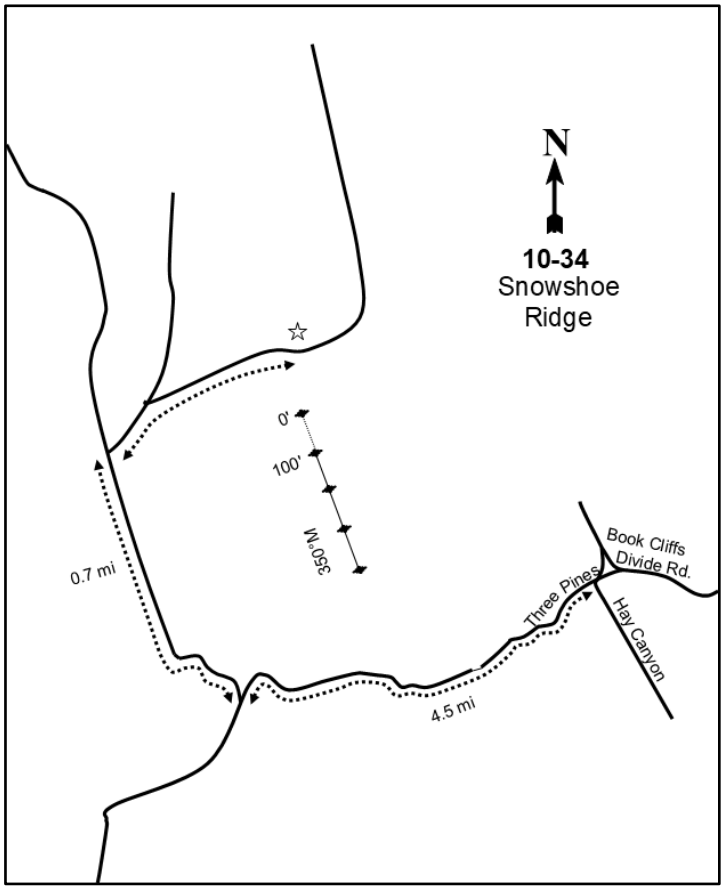
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-33.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2025 | 1 | - | 100 | - | - | - | 7.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2025 | 8 | - | 17 | 50 | 17 | 17 | 13.0 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2025 | 3 | - | - | 50 | - | 50 | 13.0 |

# SNOWSHOE RIDGE - STUDY NO. 10-34




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cedar Camp Canyon SW; Township 16S, Range 22E, Section 24 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 633770 East 4361711 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | null° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of Book Cliff Ridge Road, Winter Ridge Road, and Moon Ridge Road, drive west along Moon Ridge Road for 3.5 miles to an intersection (Cedar Cp). Turn right (north) and travel 0.5 miles to another intersection and turn right (east). Drive 0.06 miles and turn right. Drive another 0.2 miles and find the first available parking spot. Using a GPS, walk approximately 115 feet to the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | BOOKCLIFFS PASTURE |
| Elevation | 7,800 |
| Aspect | Northwest |
| Slope | 5% |
| Sample Dates | 08/05/2025 |

## Wildlife Habitat and Vegetation History

**Table 10-34.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 10-34.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2025 | Wild Crab Apple | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10-34.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.3 | 37.8 | 36.8 | 25.4 | 4.4 | 16.0 | 331.0 | 0.5 | 08/05/2025 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Wild crab apple (*Peraphyllum ramosissimum*) dominated the plant community on this site upon study establishment in 2025. A number of additional preferred browse species were also present, but they contributed much less cover than wild crab apple. Although preferred browse cover was notable during the most recent sampling, many species exhibited high amounts of poor vigor (Table 10-34.12, Table 10-34.13): this can likely be attributed in part to drought conditions in 2025. Rocky Mountain juniper (*Juniperus scopulorum*) was observed in point-quarter density measurements in low amounts, placing the site in Early Phase I of woodland succession (Table 10-34.4, Table 10-34.14). The herbaceous understory was moderately diverse and abundant; perennial grasses such as thickspike wheatgrass (*Elymus lanceolatus*) and muttongrass (*Poa fendleriana*) provided a majority of the herbaceous cover (Table 10-34.7, Table 10-34.10, Table 10-34.11).

The diverse and abundant woody overstory on this site could provide good forage for summering mule deer. Despite high diversity in the herbaceous community, however, overall cover of perennial grasses and forbs was low in 2025: this may indicate a lack of sufficient forage. Pellet transect data indicates that deer presence was high in 2025. Elk and bison and/or cattle presence was considered low in the same year. On-site observations state that there was little to no utilization of the herbaceous community during the most recent sample year (2025). However, the community did appear to be adversely affected by drought (Photos, Table 10-34.9, Table 10-34.10, Table 10-34.11).

## Trend Summary Tables

**Table 10-34.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2025 | 34.9 | 1.1 | - | 56.1 | 1.3 | - |

**Table 10-34.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2025 | - | 300 | 108 | 165 | - | 4.9 | 1.0 | 1.9 |

**Table 10-34.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2025 | 29.6 | 0.5 | 47.9 | 3.3 | 2.4 | 41.6 |

**Table 10-34.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle/Bison | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2025 | 2 | 15 | 13 | 18 |
| Year | Days Use Per Acre (ha) | | | |
| 2025 | 6.5 (16.1) | 51.6 (127.5) | 16.8 (41.4) | - |

**Table 10-34.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2025 | 19 | 52 | 8 | 200 | 18 | 5 | 81 | 1 |
| year | Average Cover (%) | | | | | | | |
| 2025 | 0.5 | 0.7 | 0.1 | 1.8 | 0.4 | 0.0 | 1.4 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10-34.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Arabis demissa (nodding rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Comandra umbellata (bastard toadflax) | Crepis intermedia (limestone hawksbeard) | Cryptantha humilis (roundspike cryptantha) | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Lithospermum incisum (narrowleaf stoneseed) | Penstemon caespitosus (mat penstemon) | Phlox longifolia (longleaf phlox) | Senecio integerrimus[a] (lambstongue ragwort) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2025 | 14 | 1 | 4 | 3 | 6 | 2 | 24 | 4 | 13 | 5 | 12 | 2 | 12 | 5 | 14 | 113 | 108 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2025 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.2 | 0.0 | 0.1 | 0.9 | 1.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Vicia americana (American vetch) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|
| year | Nested | |
| 2025 | 2 | 1 |
| year | Average Cover (%) | |
| 2025 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10-34.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Mahonia repens (creeping barberry) | Opuntia polyacantha (plains pricklypear) | Peraphyllum ramosissimum[p] (wild crab apple) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 2025 | 1.3 | 7 | 1.4 | 0.3 | 0.8 | 0.2 | 0.3 | 39.5 | 2.8 | - | 3.8 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 2025 | 0.6 | 4.8 | 0.2 | 0.2 | 0.7 | 0.4 | 0.0 | 25.4 | 2.3 | 0.1 | 1.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-34.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2025 | 260 | - | 8 | 77 | 15 | 8 | 62 | 62 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2025 | 2060 | - | 5 | 67 | 28 | 47 | 19 | 92 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2025 | 400 | - | 5 | 90 | 5 | 40 | 20 | 100 | - / - |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 2025 | 460 | - | 0 | 91 | 9 | 0 | 83 | 30 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2025 | 580 | - | 14 | 55 | 31 | 24 | 3 | 93 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 2025 | 1540 | - | 1 | 95 | 4 | 0 | 0 | 38 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2025 | 440 | - | 0 | 100 | 0 | 0 | 0 | 91 | - / - |

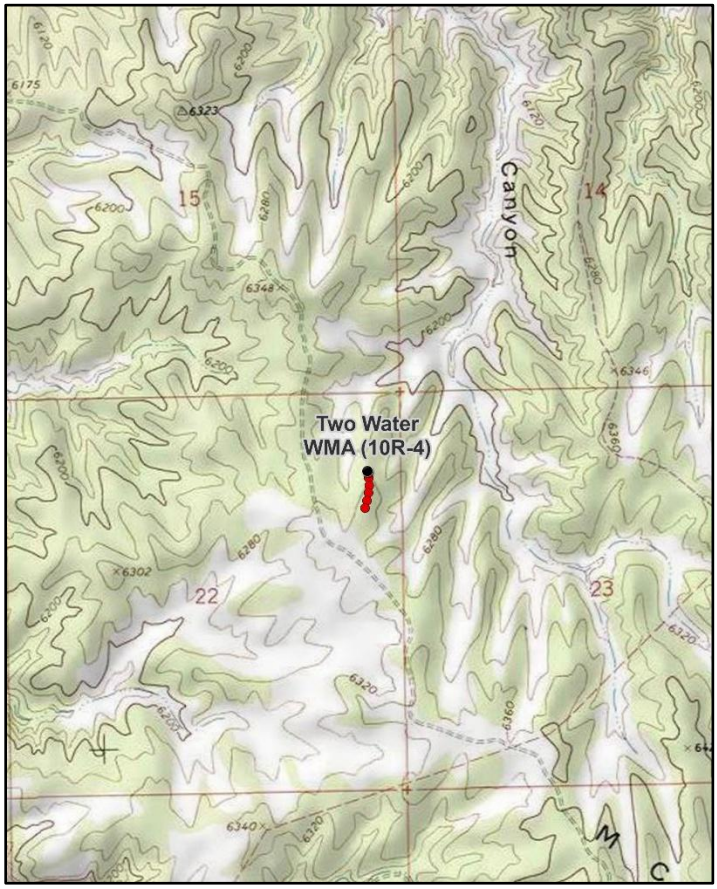
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 2025 | 2940 | 20 | 2 | 97 | 1 | 22 | 53 | 99 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2025 | 840 | 20 | 5 | 41 | 55 | 2 | 95 | 71 | - / - |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 2025 | 80 | - | 100 | 0 | 0 | 0 | 100 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2025 | 1480 | - | 5 | 87 | 8 | 41 | 20 | 96 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2025 | 40 | - | 50 | 50 | 0 | 0 | 100 | 100 | - / - |

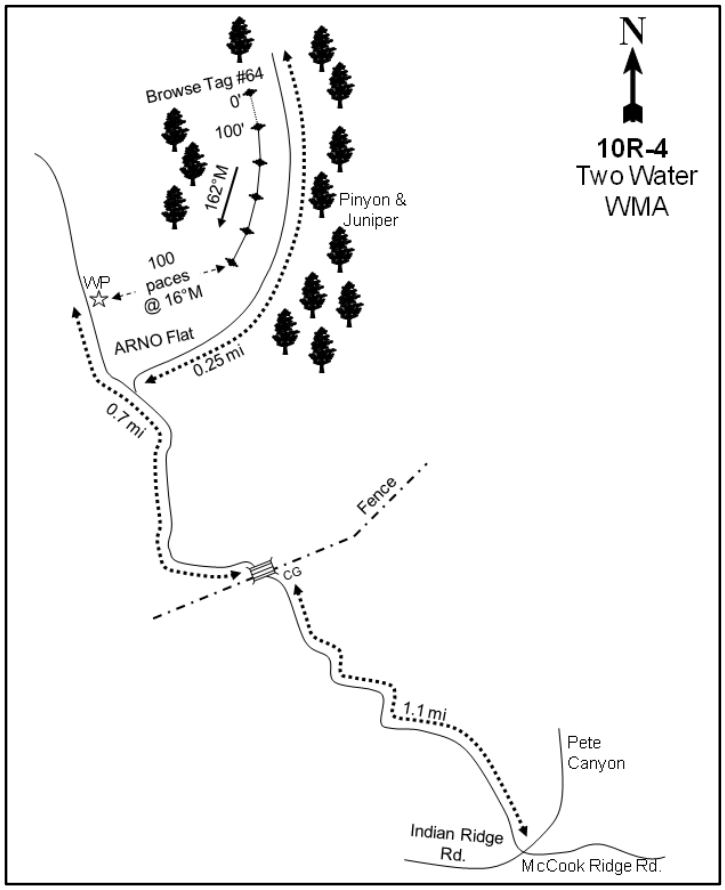
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10-34.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2025 | 2 | - | - | 100 | - | - | 5.0 |

# TWO WATER WMA - STUDY NO. 10R-4




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cooper Canyon SW; Township 13S, Range 23E, Section 22 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 643974 East 4393205 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 64 |
| Transect Bearing | 162° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Belt 2: 5ft, Belt 5: 10ft |

## Directions to Site

From the intersection of Copper Canyon, Indian Ridge, and McCook Ridge, travel northwest on McCook Ridge Road for 1.1 miles to a cattle guard. Go 0.7 miles past the cattle guard to a sagebrush flat and a witness post on the right (east) side of the road. The 500-foot stake is 100 paces into the sagebrush flat at an azimuth of 16 degrees magnetic. It is also possible to reach the site by taking the two-track road on the east side of the chaining 0.25 miles to the 0-foot stake. The 0-foot stake is marked with browse tag #64.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | OLSEN AMP |
| Elevation | 6,300ft (1,920m) |
| Aspect | North |
| Slope | 4% |
| Sample Dates | 06/16/1997, 06/05/2000, 06/07/2005, 06/09/2010, 06/03/2015, 06/03/2020, 06/09/2025 |

## Wildlife Habitat and Vegetation History

**Table 10R-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10R-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Black Sagebrush | No Encroachment |
| 2000 | Black Sagebrush | No Encroachment |
| 2005 | Black Sagebrush | No Encroachment |
| 2010 | Black Sagebrush | No Encroachment |
| 2015 | Black Sagebrush | Early Phase I |
| 2020 | Black Sagebrush | Early Phase I |
| 2025 | Black Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10R-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.3 | 25.6 | 37.8 | 36.6 | 2.0 | 3.6 | 198.4 | 0.7 | 06/16/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Upland Shallow Loam (Black Sagebrush) |
| NRCS Ecological Site # | R034XY320UT |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1997, the plant community on this site has remained in a stable state with black sagebrush (*Artemisia nova*) as the dominant vegetation component. Other shrub species have been present, but have provided much less cover (Table 10R--04.12). The herbaceous understory has been dominated by perennial grasses, primarily (*Hesperostipa comata*), throughout the duration of the study. Forbs have generally remained rare (Table 10R-04.7 Table 10R-04.10, Table 10R-04.11).

Condition of mule deer winter range on this site has ranged between poor and good-excellent since 1997; winter range condition was considered to be fair in 2025. Negative factors contributing to this fair condition include reduced preferred browse cover and recruitment; elevated decadence within the preferred browse community; reduced perennial grass cover; elevated annual grass cover; and a lack of perennial forb cover (Table 10R-04.6, Table 10R-04.7, Table 10R-04.13, Table 10R-04.15). Pellet transect data indicates that deer presence was high in 2000 and 2010; overall deer presence appears to be decreasing over time and was at its lowest in 2025. During the 2024/25 winter season the area had frequent occurrences of collared mule deer and nearby elk (Wildlife Migration Initiative). The presence of elk was high in 2005, but low to absent in all other years. Years of elevated utilization on black sagebrush include 2000 when 61% of plants sampled in density strips were moderately to heavily utilized, and 2010 and 2015 when over 70% exhibited that level of utilization. Over 60% of shadscale saltbush (*Atriplex confertifolia*) plants displayed signs of moderate to heavy use in 2015, but utilization was light in all other years. Sagebrush decadence was elevated in 2020 (Table 10R-04.9, Table 10R-04.13). On-site observations for 2025 note that moderate utilization (20-40%) was evident on grass species. However, drought may have been more of a factor on forage availability in that year than utilization.

## Trend Summary Tables

**Table 10R-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 23.1 | 0.0 | - | - | - | - |
| 2000 | 24.1 | 0.0 | - | - | - | - |
| 2005 | 25.0 | 0.2 | - | 26.1 | 0.1 | - |
| 2010 | 21.5 | 0.0 | - | 25.6 | - | - |
| 2015 | 23.3 | 0.4 | - | 31.4 | 0.2 | - |
| 2020 | 17.2 | 0.1 | - | 15.9 | - | - |
| 2025 | 17.0 | 0.0 | - | 15.9 | - | - |

**Table 10R-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | 215 | 244 | 96 | 113 | 4.0 | 5.3 | 0.5 | 0.8 |
| 2000 | 28 | 234 | 17 | 90 | 0.1 | 5.9 | 0.2 | 0.9 |
| 2005 | 10 | 226 | 83 | 86 | 0.0 | 6.4 | 1.4 | 1.0 |
| 2010 | 14 | 243 | 73 | 84 | 0.0 | 11.9 | 0.2 | 1.2 |
| 2015 | 37 | 270 | 63 | 101 | 0.2 | 15.5 | 0.3 | 0.8 |
| 2020 | 47 | 210 | 52 | 85 | 0.2 | 5.8 | 0.2 | 1.0 |
| 2025 | - | 265 | - | 84 | - | 10.8 | - | 1.0 |

**Table 10R-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 23.2 | 6.8 | 21.2 | 13.8 | 5.7 | 27.8 |
| 2000 | 31.2 | 7.5 | 21.5 | 10.6 | 5.4 | 33.0 |
| 2005 | 29.1 | 6.4 | 14.0 | 24.4 | 3.3 | 30.4 |
| 2010 | 33.0 | 5.2 | 28.4 | 11.8 | 2.1 | 38.0 |
| 2015 | 38.5 | 4.0 | 20.5 | 13.7 | 7.8 | 38.1 |
| 2020 | 28.4 | 6.5 | 37.5 | 18.3 | 7.6 | 24.9 |
| 2025 | 34.4 | 3.2 | 17.8 | 22.4 | 7.3 | 27.9 |

**Table 10R-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1997 | - | - | 33 | 11 | - | 8 |
| 2000 | 1 | - | 32 | 9 | - | 14 |
| 2005 | - | - | 43 | 11 | - | 55 |
| 2010 | - | - | 22 | 7 | - | 3 |
| 2015 | - | - | 23 | 3 | - | 9 |
| 2020 | 1 | - | 38 | 3 | 1 | 2 |
| 2025 | - | - | 14 | 2 | 1 | 3 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1997 | - | - | - | - | - | - |
| 2000 | - | - | 59.6 (147.3) | 4.7 (11.6) | - | - |
| 2005 | 2.2 (5.4) | - | 29.5 (72.8) | 44.2 (109.2) | - | - |
| 2010 | 1.5 (3.6) | - | 54.9 (135.7) | - | - | - |
| 2015 | 0.7 (1.8) | - | 21.5 (53.0) | 2.0 (5.0) | 2.3 (5.7) | - |
| 2020 | - | - | 22.1 (54.6) | 2.7 (6.6) | 8.1 (20.1) | - |
| 2025 | - | 8.7 (21.5)* | 17.4 (43.0) | - | 2.9 (7.2) | - |

*Pellets per acre (ha)

**Table 10R-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pascopyrum smithii (western wheatgrass) | Pleuraphis jamesii (James' galleta) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1997 | 64 | - | 215 | 84 | 92 | 6 | 75 | - | 13 |
| 2000 | 34 | 25 | 28 | 92 | 90 | 2 | 46 | - | 5 |
| 2005 | 53 | 40 | 10 | 52 | 110 | 4 | 43 | - | 13 |
| 2010 | 18 | 43 | 14 | 61 | 146 | 2 | 32 | - | 12 |
| 2015 | 21 | 48 | 37 | 36 | 188 | 17 | 39 | 11 | 8 |
| 2020 | 32 | 34 | 47 | 16 | 95 | 13 | 70 | 3 | - |
| 2025 | 15 | 48 | - | 11 | 195 | 9 | 62 | 5 | 5 |
| year | Average Cover (%) | | | | | | | | |
| 1997 | 0.9 | - | 4.0 | 0.9 | 2.0 | 0.1 | 1.1 | - | 0.4 |
| 2000 | 0.5 | 0.3 | 0.1 | 1.0 | 2.9 | 0.0 | 0.8 | - | 0.3 |
| 2005 | 0.7 | 1.0 | 0.0 | 0.6 | 2.9 | 0.0 | 0.7 | - | 0.4 |
| 2010 | 0.6 | 1.4 | 0.0 | 1.1 | 7.4 | 0.0 | 1.0 | - | 0.3 |
| 2015 | 0.7 | 2.4 | 0.2 | 0.5 | 9.2 | 0.9 | 0.9 | 0.3 | 0.5 |
| 2020 | 0.4 | 1.4 | 0.2 | 0.1 | 1.7 | 0.1 | 2.1 | 0.0 | - |
| 2025 | 0.6 | 2.2 | - | 0.1 | 5.7 | 0.1 | 2.1 | 0.0 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Camelina microcarpa[ai] (littlepod false flax) | Castilleja (Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaetopappa ericoides (rose heath) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Machaeranthera grindelioides (rayless tansyaster) | Navarretia intertexta[a] (needleleaf navarretia) | Orobanche fasciculata (clustered broomrape) | Penstemon (beardtongue) | Polygonum douglasii[a] (Douglas' knotweed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | 6 | - | - | 4 | - | - | 10 | 32 | - | 3 | 69 | - | - | 5 | - | 2 | - |
| 2000 | - | - | - | - | - | - | - | 6 | - | - | 12 | - | 1 | - | - | - | - |
| 2005 | - | - | - | 1 | - | - | 9 | 33 | 11 | 2 | 59 | 1 | - | 2 | - | - | - |
| 2010 | - | - | - | 3 | - | 2 | 3 | - | - | - | 73 | - | - | - | - | - | - |
| 2015 | - | 5 | - | - | - | - | 5 | 21 | 17 | - | 32 | 3 | 2 | 4 | 2 | - | 3 |
| 2020 | - | 4 | 4 | - | 11 | 2 | 6 | - | - | 4 | 44 | - | - | - | - | - | - |
| 2025 | - | - | - | - | - | - | 7 | - | - | 3 | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | 0.0 | - | - | 0.0 | - | - | 0.1 | 0.1 | - | 0.0 | 0.4 | - | - | 0.0 | - | 0.0 | - |
| 2000 | - | - | - | - | - | - | - | 0.0 | - | - | 0.2 | - | 0.0 | - | - | - | - |
| 2005 | - | - | - | 0.0 | - | - | 0.1 | 0.3 | 0.0 | 0.0 | 1.0 | 0.0 | - | 0.0 | - | - | - |
| 2010 | - | - | - | 0.0 | - | 0.0 | 0.0 | - | - | - | 0.2 | - | - | - | - | - | - |
| 2015 | - | 0.0 | - | - | - | - | 0.0 | 0.1 | 0.1 | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 |
| 2020 | - | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | - | - | 0.0 | 0.1 | - | - | - | - | - | - |
| 2025 | - | - | - | - | - | - | 0.0 | - | - | 0.0 | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | unknown annual forb[a] (unknown forb) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1997 | - | 4 | 100 | - | 2 | 9 |
| 2000 | - | 2 | 85 | 8 | 2 | - |
| 2005 | - | - | 77 | 4 | - | - |
| 2010 | - | 8 | 72 | 6 | - | - |
| 2015 | - | 12 | 74 | 13 | - | - |
| 2020 | 2 | 1 | 68 | - | - | - |
| 2025 | - | - | 73 | 5 | - | - |
| year | Average Cover (%) | | | | | |
| 1997 | - | 0.0 | 0.6 | - | 0.0 | 0.0 |
| 2000 | - | 0.0 | 0.8 | 0.0 | 0.0 | - |
| 2005 | - | - | 0.8 | 0.0 | - | - |
| 2010 | - | 0.1 | 1.1 | 0.0 | - | - |
| 2015 | - | 0.0 | 0.7 | 0.0 | - | - |
| 2020 | 0.0 | 0.0 | 1.0 | - | - | - |
| 2025 | - | - | 0.9 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Cercocarpus ledifolius[p] (curl-leaf mountain mahogany) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) | Pediocactus simpsonii (mountain ball cactus) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 0.3 | 23.6 | 0.2 | - | 0.1 | 2 | - | - |
| 2010 | 0.3 | 23.7 | 0.3 | - | - | 1.3 | - | - |
| 2015 | 1.3 | 29.2 | - | - | 0.2 | 0.9 | - | - |
| 2020 | - | 14.8 | 0.3 | - | - | 0.8 | - | - |
| 2025 | - | 15 | 0.1 | - | - | 0.8 | - | - |
| year | Quadrat Cover (%) | | | | | | | |
| 1997 | 0.6 | 19.5 | 0.8 | - | - | 2.1 | - | 0.0 |
| 2000 | 1.0 | 20.9 | 0.8 | - | 0.0 | 1.4 | - | 0.0 |
| 2005 | 0.2 | 22.3 | 0.3 | - | 0.2 | 2.2 | 0.0 | - |
| 2010 | 0.5 | 19.5 | 0.3 | - | 0.0 | 1.1 | - | 0.0 |
| 2015 | 0.9 | 21.2 | 0.1 | - | 0.4 | 1.1 | - | 0.0 |
| 2020 | 0.0 | 15.7 | 0.2 | - | - | 1.3 | - | 0.1 |
| 2025 | 0.0 | 15.2 | 0.4 | 0.0 | 0.0 | 1.3 | - | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1997 | 1800 | - | 14 | 86 | 0 | 0 | 0 | 0 | 27/24 |
| 2000 | 2000 | 20 | 23 | 77 | 0 | 2 | 0 | 0 | 11/21 |
| 2005 | 380 | 100 | 11 | 90 | 0 | 5 | 0 | 0 | 23/31 |
| 2010 | 760 | - | 11 | 90 | 0 | 3 | 0 | 8 | 21/26 |
| 2015 | 2240 | 100 | 27 | 73 | 0 | 6 | 0 | 0 | 11/19 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 5/4 |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1997 | 13260 | 420 | 23 | 72 | 5 | 28 | 2 | 0 | 19/43 |
| 2000 | 21180 | 260 | 14 | 75 | 12 | 51 | 10 | 4 | 16/37 |
| 2005 | 20180 | 80 | 6 | 72 | 23 | 40 | 3 | 7 | 19/43 |
| 2010 | 16460 | 980 | 7 | 85 | 8 | 30 | 41 | 5 | 20/41 |
| 2015 | 14860 | 200 | 8 | 84 | 8 | 12 | 64 | 7 | 18/42 |
| 2020 | 10160 | - | 14 | 39 | 48 | 14 | 34 | 48 | 17/34 |
| 2025 | 10000 | 60 | 3 | 76 | 21 | 28 | 28 | 21 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1997 | 880 | - | 7 | 68 | 25 | 16 | 14 | 16 | 40/42 |
| 2000 | 860 | - | 0 | 65 | 35 | 42 | 0 | 21 | 37/44 |
| 2005 | 600 | - | 0 | 50 | 50 | 20 | 7 | 37 | 43/40 |
| 2010 | 480 | 20 | 8 | 83 | 8 | 4 | 0 | 8 | 40/40 |
| 2015 | 360 | - | 11 | 78 | 11 | 17 | 44 | 17 | 39/37 |
| 2020 | 260 | 20 | 15 | 54 | 31 | 31 | 8 | 23 | 38/39 |
| 2025 | 500 | 20 | 32 | 52 | 16 | 12 | 4 | 8 | - / - |
| Cercocarpus ledifolius[P] -- (curl-leaf mountain mahogany) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 280 | - | 7 | 93 | 0 | 0 | 0 | 0 | 20/15 |
| 2000 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/8 |
| 2005 | 400 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/18 |
| 2010 | 680 | - | 15 | 82 | 3 | 0 | 0 | 3 | 14/14 |
| 2015 | 640 | 220 | 25 | 75 | 0 | 0 | 0 | 0 | 18/16 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 240 | - | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1997 | 4060 | 60 | 10 | 89 | 1 | 22 | 3 | 1 | 26/26 |
| 2000 | 2960 | - | 0 | 82 | 18 | 35 | 7 | 11 | 22/23 |
| 2005 | 3520 | 20 | 2 | 97 | 1 | 33 | 51 | 1 | 24/24 |
| 2010 | 2800 | 20 | 7 | 92 | 1 | 31 | 14 | 2 | 23/22 |
| 2015 | 1500 | 20 | 23 | 64 | 13 | 22 | 36 | 15 | 23/23 |
| 2020 | 1800 | 20 | 24 | 76 | 0 | 29 | 23 | 3 | 23/20 |
| 2025 | 2540 | 200 | 24 | 72 | 3 | 24 | 9 | 4 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/22 |
| 2000 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/13 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/24 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/17 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/15 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/23 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1997 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 180 | - | 11 | 78 | 11 | 0 | 0 | 11 | 4/7 |
| 2020 | 200 | - | 20 | 80 | 0 | 0 | 0 | 0 | 2/5 |
| 2025 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

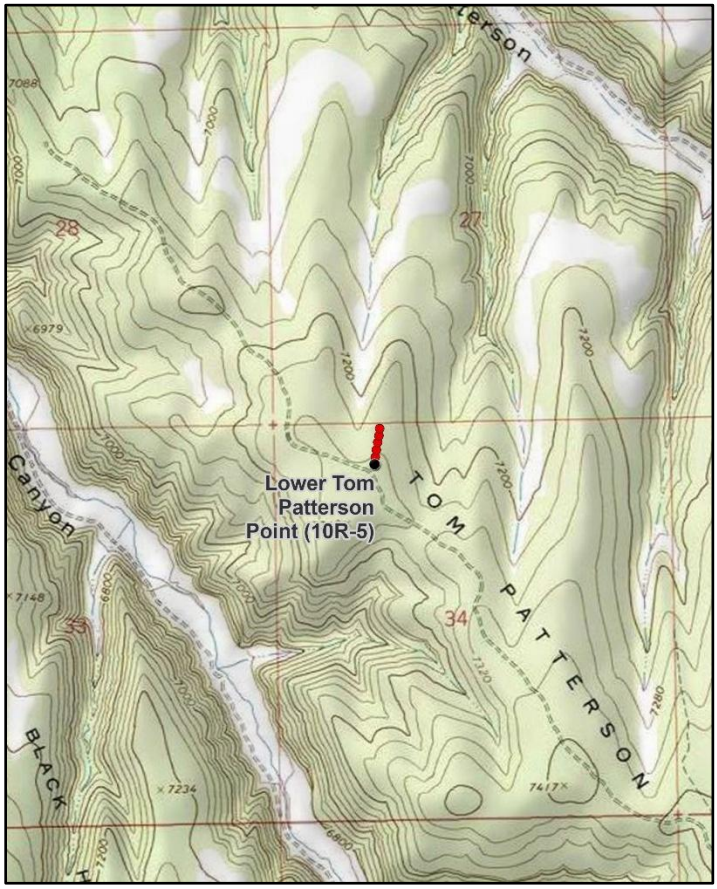
**Table 10R-04.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

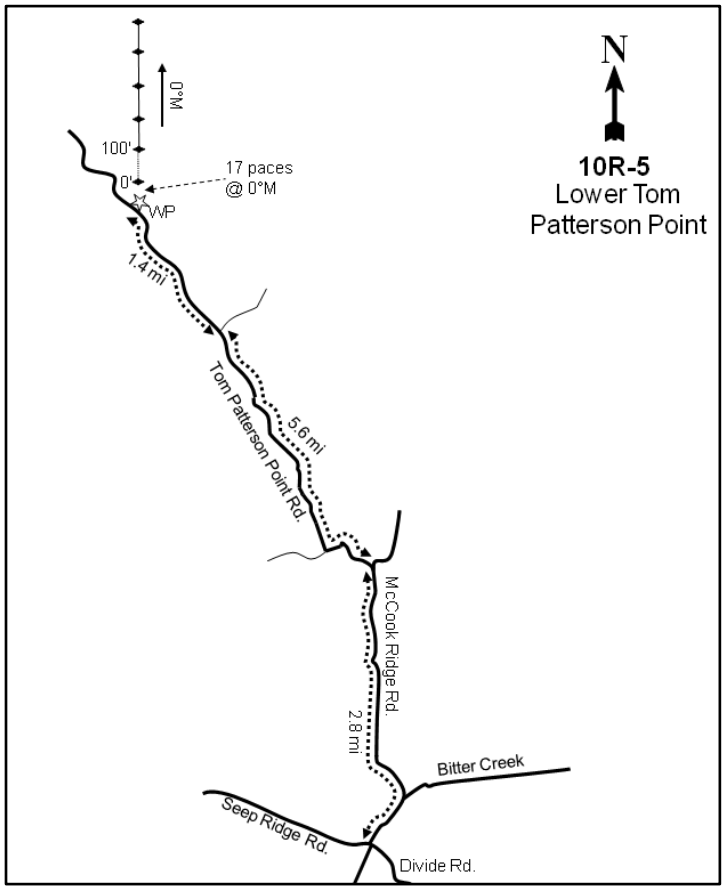
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 1 | - | 100 | - | - | - | 5.0 |
| 2025 | 1 | - | 100 | - | - | - | 8.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 1 | - | 100 | - | - | - | 5.0 |

**Table 10R-04.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 28.5 | 13.4 | 10.6 | 10.7 | -3.0 | 1.6 | 0.0 | **61.8** | Fair |
| 2000 | 29.7 | 11.3 | 6.4 | 11.8 | -0.1 | 1.8 | 0.0 | **60.9** | Fair |
| 2005 | 30.0 | 8.7 | 2.7 | 12.8 | 0.0 | 2.1 | 0.0 | **56.3** | Fair |
| 2010 | 30.0 | 12.8 | 3.5 | 23.8 | 0.0 | 2.5 | 0.0 | **72.6** | Good |
| 2015 | 30.0 | 12.6 | 4.5 | 30.0 | -0.2 | 1.7 | 0.0 | **78.6** | Good-Excellent |
| 2020 | 19.8 | 1.6 | 7.2 | 11.7 | -0.2 | 2.0 | 0.0 | **42.1** | Poor |
| 2025 | 19.9 | 9.0 | 2.3 | 21.6 | 0.0 | 1.9 | 0.0 | **54.7** | Fair |

# LOWER TOM PATTERSON POINT - STUDY NO. 10R-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tom Patterson Canyon; Township 14S, Range 24E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 652792 East 4380665 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 0° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of McCook Ridge Road and Seep Ridge Road, travel north on McCook Ridge Road for 2.8 miles. Turn left onto Tom Patterson Point Road and go 5.6 miles to a fork. Take the left fork and travel 1.4 miles to a witness post on the right (east) side of the road. From the witness post walk 17 paces due north to the 0-foot stake.

**Note**: A UTV is recommended for accessing this site.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SWEET WATER |
| Elevation | 7,281ft (2,219m) |
| Aspect | North |
| Slope | 5% |
| Sample Dates | 06/11/1997, 06/06/2000, 06/09/2005, 06/10/2010, 06/04/2015, 06/01/2020, 06/09/2025 |

**Table 10R-05.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Mechanical - Bullhog | Tom Patterson Mastication (Proposed) | 7294 | Fall 2025 | 3652 |
| Chaining - Chain Unknown | - | - | 1960s | - |
| Seeding - Seed Unknown | - | - | 1960s | - |
| Fire - Wildfire | - | - | 1980s | - |

## Wildlife Habitat and Vegetation History

**Table 10R-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | substantial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10R-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Perennial Grass | Early Phase I |
| 2000 | Perennial Grass | Early Phase I |
| 2005 | Perennial Grass | Early Phase I |
| 2010 | Perennial Grass | Early Phase I |
| 2015 | Perennial Grass | Early Phase I |
| 2020 | Perennial Grass | Early Phase I |
| 2025 | Perennial Grass | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10R-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 6.8 | 48.0 | 28.8 | 23.2 | 3.1 | 7.4 | 38.4 | 2.0 | 06/11/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1997-2025 - Introduced Grassland State: Community Phase 6.1 |

Since study establishment in 1997, this site has remained dominated by seeded introduced perennial grass species, namely crested wheatgrass (*Agropyron cristatum*) (10R-05.10). Perennial forbs have been diverse, but have not contributed notable cover in comparison with grasses (10R-05.11). Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) has remained scattered across the site in small, localized patches (Table 10R-05.12, Table 10R-05.13). Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have been observed in point-quarter data with low density since 2015 (Table 10R-05.14); there may be potential for further infilling in future sample years. However, the site has remained within Early Phase I of woodland succession since 1997 (Table 10R-05.4) and a bullhog treatment is scheduled for the fall of 2025 (Table 10R-05.1), indicating that this may not be an immediate concern.

The diverse and abundant grass community on this site could provide adequate forage for summering mule deer. However, pellet transect data indicates that deer presence has remained very low in most sample years (except 2010 when it was high). However, elk presence was high in all years sampled since 2000, except in 2015 when it was considered to be moderate. During the 2024/25 winter season the area had few occurrences of collared elk (Wildlife Migration Initiative). Bison and/or cattle presence has generally remained low. On-site observations state that there was heavy utilization of the herbaceous understory during the most recent sample year (2025). However, the understory does not appear to have been adversely affected by utilization but more by drought (Photos, Table 10R-05.9, Table 10R-05.10, Table 10R-05.11).

## Trend Summary Tables

**Table 10R-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 0.5 | 0.0 | - | - | - | - |
| 2000 | 0.4 | 0.5 | - | - | - | - |
| 2005 | 0.5 | 0.3 | - | 0.4 | 0.7 | - |
| 2010 | 1.0 | 0.9 | - | 1.0 | 0.3 | - |
| 2015 | 1.2 | 1.4 | - | 1.6 | 2.0 | - |
| 2020 | 2.0 | 1.5 | - | 3.2 | 0.7 | - |
| 2025 | 3.1 | 1.7 | - | 3.8 | 1.6 | - |

**Table 10R-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | - | 434 | 25 | 191 | - | 14.3 | 0.1 | 3.9 |
| 2000 | - | 407 | 49 | 165 | - | 18.2 | 0.2 | 2.5 |
| 2005 | - | 409 | 20 | 114 | - | 36.0 | 0.1 | 2.6 |
| 2010 | - | 419 | 27 | 161 | - | 33.3 | 0.3 | 4.9 |
| 2015 | - | 410 | 62 | 207 | - | 33.5 | 0.5 | 5.3 |
| 2020 | - | 392 | 37 | 185 | - | 32.1 | 0.1 | 5.5 |
| 2025 | - | 394 | 29 | 171 | - | 27.0 | 0.1 | 4.7 |

**Table 10R-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 26.9 | 1.1 | 24.5 | 7.1 | 1.6 | 20.0 |
| 2000 | 35.2 | 2.9 | 33.4 | 2.2 | 0.4 | 27.9 |
| 2005 | 45.9 | 0.6 | 18.8 | 3.5 | 1.9 | 40.6 |
| 2010 | 25.9 | 0.4 | 42.9 | 4.9 | 0.5 | 41.0 |
| 2015 | 31.0 | 6.1 | 35.1 | 3.2 | 1.0 | 41.5 |
| 2020 | 33.2 | 5.0 | 41.2 | 1.2 | 1.2 | 40.4 |
| 2025 | 37.5 | 1.3 | 34.3 | 4.0 | 1.1 | 36.3 |

**Table 10R-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1997 | 4 | 2 | 70 | 3 |
| 2000 | 3 | 5 | 58 | 5 |
| 2005 | 1 | 19 | 80 | 17 |
| 2010 | 3 | 19 | 40 | 5 |
| 2015 | - | 4 | 35 | 1 |
| 2020 | 3 | 9 | 40 | 7 |
| 2025 | 1 | 11 | 44 | 10 |
| Year | Days Use Per Acre (ha) | | | |
| 1997 | - | - | - | - |
| 2000 | 13.8 (34.1) | 0.7 (1.7) | 101.2 (249.9) | - |
| 2005 | 5.1 (12.6) | 4.7 (11.6) | 107.2 (264.8) | - |
| 2010 | 13.1 (32.3) | 70.4 (173.8) | 53.6 (132.4) | - |
| 2015 | 0.7 (1.8) | 0.7 (1.7) | 34.2 (84.4) | - |
| 2020 | 7.2 (17.9) | 3.4 (8.3) | 124.7 (307.9) | - |
| 2025 | 0.7 (1.8) | 1.3 (3.3) | 69.0 (170.5) | - |

**Table 10R-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Carex (sedge) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1997 | 434 | 3 | 25 | - | 8 | 2 | - |
| 2000 | 397 | - | 28 | 3 | 8 | - | 5 |
| 2005 | 400 | 3 | 14 | 20 | 28 | 2 | 3 |
| 2010 | 419 | 5 | 7 | 3 | 9 | 3 | 8 |
| 2015 | 405 | 9 | 2 | - | - | 2 | 10 |
| 2020 | 391 | 7 | - | 10 | 16 | 2 | 6 |
| 2025 | 389 | 7 | 3 | - | 1 | - | 9 |
| year | Average Cover (%) | | | | | | |
| 1997 | 13.7 | 0.0 | 0.3 | - | 0.1 | 0.1 | - |
| 2000 | 17.6 | - | 0.5 | 0.0 | 0.0 | - | 0.0 |
| 2005 | 34.0 | 0.1 | 0.3 | 1.0 | 0.4 | 0.1 | 0.0 |
| 2010 | 32.0 | 0.1 | 0.0 | 0.1 | 0.1 | 0.2 | 0.7 |
| 2015 | 32.1 | 0.3 | 0.0 | - | - | 0.1 | 0.9 |
| 2020 | 31.2 | 0.4 | - | 0.1 | 0.1 | 0.1 | 0.2 |
| 2025 | 26.6 | 0.2 | 0.0 | - | 0.0 | - | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Antennaria parvifolia (small-leaf pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus (milkvetch) | Astragalus chamaeleuce var. chamaeleuce (cicada milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus spatulatus (tufted milkvetch) | Astragalus utahensis (Utah milkvetch) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Descurainia pinnata[a] (western tansymustard) | Erigeron (fleabane) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum (buckwheat) | Hedysarum boreale (Utah sweetvetch) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | - | - | 7 | 10 | 4 | - | 4 | - | - | 1 | - | - | 8 | - | - | - | 33 |
| 2000 | - | - | 14 | 3 | 13 | - | - | - | 3 | - | - | - | 7 | - | - | 1 | - |
| 2005 | 3 | - | 3 | 5 | - | - | 8 | - | 1 | - | 4 | 8 | 2 | - | - | - | 13 |
| 2010 | 4 | - | 5 | - | 16 | - | 11 | 1 | 8 | - | - | - | 10 | - | 3 | - | - |
| 2015 | 6 | - | 5 | 27 | - | 15 | 3 | 3 | - | - | - | - | 9 | - | 42 | - | 20 |
| 2020 | 2 | - | 6 | 13 | - | - | 2 | 4 | 9 | - | - | - | - | - | 23 | - | 17 |
| 2025 | - | 6 | - | 18 | 1 | 5 | 8 | - | - | - | - | 2 | - | 0 | 49 | - | 14 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | - | - | 0.3 | 0.0 | 0.0 | - | 0.1 | - | - | 0.0 | - | - | 0.1 | - | - | - | 0.8 |
| 2000 | - | - | 0.4 | 0.0 | 0.4 | - | - | - | 0.0 | - | - | - | 0.0 | - | - | 0.0 | - |
| 2005 | 0.1 | - | 0.1 | 0.0 | - | - | 0.2 | - | 0.0 | - | 0.0 | 0.1 | 0.0 | - | - | - | 0.4 |
| 2010 | 0.1 | - | 0.2 | - | 1.0 | - | 0.3 | 0.0 | 0.0 | - | - | - | 0.2 | - | 0.0 | - | - |
| 2015 | 0.2 | - | 0.4 | 0.1 | - | 0.1 | 0.0 | 0.0 | - | - | - | - | 0.0 | - | 0.2 | - | 1.1 |
| 2020 | 0.0 | - | 0.2 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | - | - | - | 0.1 | - | 1.2 |
| 2025 | - | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 | - | - | - | - | 0.0 | - | 0.0 | 0.8 | - | 1.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Heterotheca villosa (hairy false goldenaster) | Lappula occidentalis[a] (flatspine stickseed) | Lygodesmia (skeletonplant) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon pachyphyllus (thickleaf beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Salsola tragus[ai] (prickly Russian thistle) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Taraxacum officinale (common dandelion) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | - | - | 4 | - | 25 | 46 | 6 | 81 | 8 | - | - | - | 49 | - | 24 | - | 15 |
| 2000 | - | - | - | - | - | 70 | - | 52 | 12 | 3 | - | - | 60 | - | 9 | - | 46 |
| 2005 | - | 4 | 10 | - | 2 | 10 | 5 | 1 | 11 | 4 | - | 2 | 71 | - | - | 4 | 0 |
| 2010 | - | 9 | - | - | 13 | 16 | 3 | 14 | 12 | - | 3 | - | 87 | - | 1 | 13 | 18 |
| 2015 | - | 10 | - | - | 8 | 31 | - | 15 | 15 | - | - | - | 117 | 6 | - | 7 | 26 |
| 2020 | 7 | 22 | 18 | - | 24 | 1 | - | 1 | 16 | - | - | - | 98 | - | - | - | 2 |
| 2025 | 23 | 8 | - | 3 | 11 | 5 | - | 3 | 19 | - | - | 1 | 71 | - | - | 4 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | - | - | 0.0 | - | 0.2 | 0.3 | 0.1 | 1.2 | 0.2 | - | - | - | 0.4 | - | 0.2 | - | 0.0 |
| 2000 | - | - | - | - | - | 0.5 | - | 0.7 | 0.1 | 0.0 | - | - | 0.4 | - | 0.1 | - | 0.2 |
| 2005 | - | 0.0 | 0.1 | - | 0.0 | 0.2 | 0.0 | 0.0 | 0.3 | 0.0 | - | 0.0 | 0.9 | - | - | 0.0 | 0.0 |
| 2010 | - | 0.1 | - | - | 0.1 | 0.2 | 0.2 | 0.3 | 1.1 | - | 0.0 | - | 1.0 | - | 0.0 | 0.1 | 0.2 |
| 2015 | - | 0.0 | - | - | 0.3 | 0.2 | - | 0.6 | 1.1 | - | - | - | 1.0 | 0.0 | - | 0.0 | 0.4 |
| 2020 | 0.4 | 0.0 | 0.3 | - | 0.7 | 0.0 | - | 0.0 | 1.1 | - | - | - | 1.4 | - | - | - | 0.0 |
| 2025 | 0.7 | 0.0 | - | 0.0 | 0.3 | 0.0 | - | 0.0 | 1.1 | - | - | 0.0 | 0.6 | - | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 1997 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2005 | 0.4 | - | 0.1 | - | 0.6 | - |
| 2010 | 1 | - | - | 0.1 | 0.2 | - |
| 2015 | 1.6 | - | - | 0.3 | 1.7 | - |
| 2020 | 3.2 | - | - | 0.3 | 0.4 | - |
| 2025 | 3.8 | - | 0.5 | - | 1.1 | - |
| year | Quadrat Cover (%) | | | | | |
| 1997 | 0.4 | 0.1 | - | - | 0.0 | 0.0 |
| 2000 | 0.4 | - | - | - | 0.5 | 0.0 |
| 2005 | 0.5 | - | 0.0 | 0.0 | 0.3 | - |
| 2010 | 1.0 | - | 0.0 | 0.2 | 0.7 | - |
| 2015 | 1.2 | - | 0.0 | 0.2 | 1.2 | - |
| 2020 | 2.0 | - | 0.0 | 0.1 | 1.3 | - |
| 2025 | 3.1 | - | 0.4 | - | 1.4 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 22/32 |
| 2010 | - | - | - | - | - | - | - | - | 14/26 |
| 2015 | - | - | - | - | - | - | - | - | 20/29 |
| 2020 | 20 | 20 | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1997 | 180 | 60 | 56 | 44 | 0 | 11 | 0 | 22 | 68/87 |
| 2000 | 40 | 40 | 50 | 50 | 0 | 0 | 0 | 0 | 84/90 |
| 2005 | 160 | 700 | 50 | 50 | 0 | 0 | 38 | 0 | 67/89 |
| 2010 | 1020 | 180 | 88 | 12 | 0 | 4 | 2 | 0 | 60/86 |
| 2015 | 580 | - | 14 | 86 | 0 | 0 | 90 | 0 | 50/81 |
| 2020 | 620 | 1220 | 19 | 81 | 0 | 68 | 0 | 0 | 60/95 |
| 2025 | 1160 | 120 | 36 | 62 | 2 | 36 | 5 | 2 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1997 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | 105/103 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 94/89 |
| 2005 | - | - | - | - | - | - | - | - | 102/86 |
| 2010 | - | - | - | - | - | - | - | - | 74/72 |
| 2015 | - | - | - | - | - | - | - | - | 65/83 |
| 2020 | - | - | - | - | - | - | - | - | 85/112 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/41 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 12/24 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/33 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 17/46 |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/36 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 0 | 100 | 0 | 50 | 50 | 0 | 28/33 |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 32/42 |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 50 | 0 | 27/46 |
| 2020 | 60 | - | 33 | 33 | 33 | 67 | 33 | 33 | 40/60 |
| 2025 | 120 | - | 0 | 83 | 17 | 17 | 0 | 17 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 36/42 |
| 2005 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 59/65 |
| 2010 | 60 | - | 33 | 67 | 0 | 100 | 0 | 0 | 67/73 |
| 2015 | 100 | - | 20 | 40 | 40 | 0 | 80 | 80 | 57/76 |
| 2020 | 100 | - | 0 | 60 | 40 | 40 | 40 | 60 | 64/79 |
| 2025 | 120 | - | 67 | 0 | 33 | 33 | 0 | 67 | - / - |

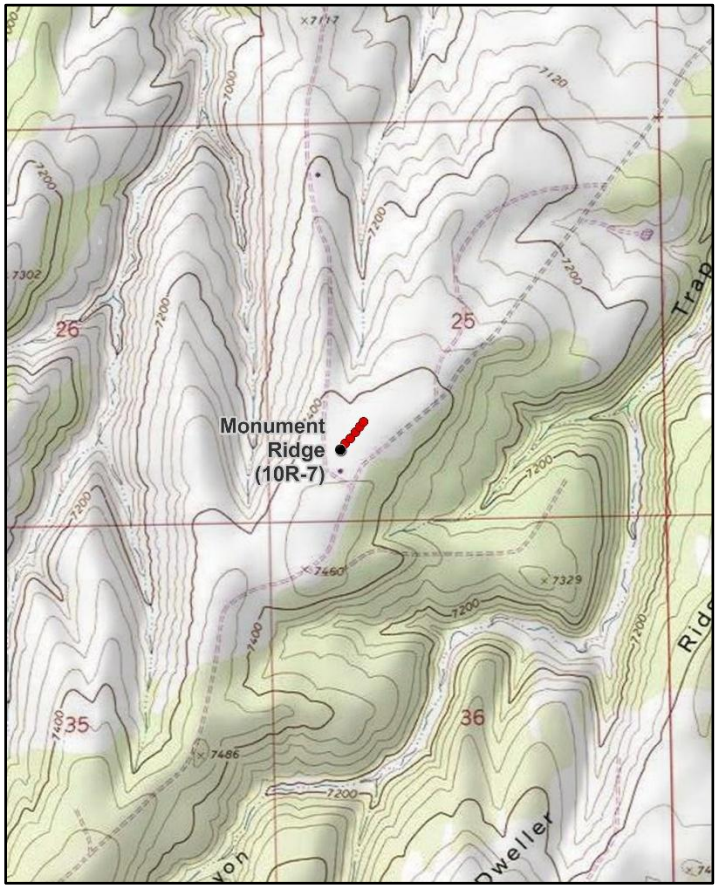
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/15 |
| 2000 | 260 | 20 | 15 | 85 | 0 | 0 | 0 | 0 | 19/23 |
| 2005 | 1220 | - | 2 | 98 | 0 | 26 | 3 | 0 | 17/21 |
| 2010 | 1460 | - | 14 | 82 | 4 | 0 | 0 | 3 | 14/19 |
| 2015 | 3120 | 280 | 21 | 78 | 1 | 1 | 0 | 1 | 17/24 |
| 2020 | 2380 | 260 | 17 | 79 | 4 | 1 | 0 | 4 | 13/16 |
| 2025 | 3440 | - | 12 | 85 | 4 | 0 | 0 | 4 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 3/7 |
| 2015 | - | - | - | - | - | - | - | - | 6/12 |
| 2020 | - | - | - | - | - | - | - | - | 12/23 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 110/90 |
| 2020 | - | - | - | - | - | - | - | - | 123/157 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1997 | 40 | - | 0 | 50 | 50 | 0 | 0 | 0 | 86/93 |
| 2000 | 40 | - | 0 | 50 | 50 | 100 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 81/113 |
| 2010 | - | - | - | - | - | - | - | - | 88/109 |
| 2015 | - | - | - | - | - | - | - | - | 85/98 |
| 2020 | - | - | - | - | - | - | - | - | 76/106 |

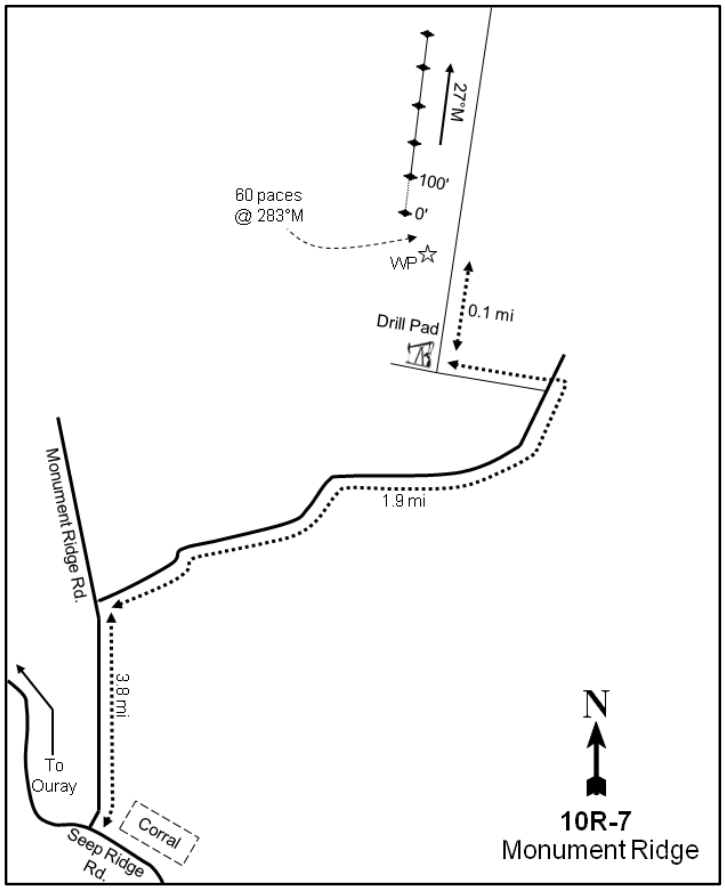
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 1 | - | - | 100 | - | - | 8.0 |
| 2020 | 1 | - | - | 100 | - | - | 12.0 |
| 2025 | 4 | 50 | - | 50 | - | - | 9.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 3 | - | - | 33 | 67 | - | 18.0 |
| 2020 | 3 | - | - | 33 | 67 | - | 19.3 |
| 2025 | 3 | - | - | - | 67 | 33 | 39.0 |

# MONUMENT RIDGE - STUDY NO. 10R-7




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Seep Canyon NE; Township 14S, Range 23E, Section 25 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 646182 East 4381204 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 88 DWR |
| Transect Bearing | 27° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From the intersection of Seep Ridge Road and Monument Ridge Road, turn north onto Monument Ridge Road and drive 3.8 miles to a fork. Take the right fork and travel 1.9 miles to a turnoff that leads to a drill pad. Go straight past this turnoff for 0.1 miles to a witness post on the left (north) side of the road. Walk 60 paces from the witness post at 283 degrees magnetic to the 0-foot stake that is marked with browse tag #88 DWR.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SWEET WATER |
| Elevation | 7,200ft (2,195m) |
| Aspect | North |
| Slope | 1-2% |
| Sample Dates | 06/10/1997, 06/07/2000, 06/09/2005, 06/10/2010, 06/04/2015, 06/03/2020, 06/11/2025 |

**Table 10R-07.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Mechanical - Bullhog | Monument Ridge Bullhog II | 4381 | October-November 2019 | 2081 |
| Hand Crew - Lop and Scatter | Seep Ridge Maintenance Lop & Scatter | 5517 | Fall 2020 | 4491 |
| Hand Crew - Lop and Scatter | Monument Ridge PJ Removal | 22 | August 2005 | 1004 |
| Chaining - Chain Unknown | - | - | 1960s | - |
| Seeding - Harrow | Monument Ridge Fire Reseeding 1956 | LTDL 7694-21017 | January 1956-December 1956 | 4646 |
| Fire - Wildfire | Monument Ridge Fire | - | January 1955-December 1955 | - |

**Table 10R-07.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Monument Ridge Fire Reseeding 1956 | | | Unknown | Jan 1956 | 4646 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | | 0.90 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 10R-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | substantial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | |

**Table 10R-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Perennial Grass | Early Phase I |
| 2000 | Perennial Grass | Early Phase I |
| 2005 | Perennial Grass | Early Phase I |
| 2010 | Perennial Grass | Early Phase I |
| 2015 | Perennial Grass | Early Phase I |
| 2020 | Perennial Grass | Early Phase I |
| 2025 | Perennial Grass | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10R-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.0 | 40.0 | 35.4 | 24.6 | 3.5 | 5.0 | 115.2 | 3.3 | 06/10/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY448UT |
| States and Transitions | 1997-2025 - Introduced Grassland State: Community Phase 6.1 |

Since study establishment in 1997, this site has remained dominated by the seeded introduced perennial grass species crested wheatgrass (*Agropyron cristatum*), which has increased in cover over the sample years (Table 10R-07.2, Table 10R-07.10). Perennial forbs have been diverse, but have contributed relatively little cover compared to grasses (Table 10R-07.11). Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) has remained scattered across the site in localized, small patches, although density has increased over time (Table 10R-07.12, Table 10R-07.13). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been observed in point-quarter data with low density (Table 10R-07.14). Repeat photography showed an increase in both size and cover of pinyon and juniper trees from 1997 to 2005, but they were removed by a lop and scatter treatment following the 2005 sampling. Additional tree-removing treatments have taken place in later years (Table 10R-07.1), but infilling could occur in the future without sustained maintenance. However, the site has remained within Early Phase I of woodland succession since 1997, indicating that this is likely not an immediate concern.

This site's condition as mule deer winter range has ranged between very poor and good since 1997; winter range condition was considered to be good in 2025. Factors that negatively influence deer winter range condition include reduced preferred browse and forb cover. However, the most recent sample year shows an episode of preferred browse recruitment (Table 10R-07.6, Table 10R-

07.7, Table 10R-07.13, Table 10R-07.15). According to pellet transect data, deer presence has been low over the course of the study. Elk presence has generally been moderate but was high in 2000 and 2005. During the 2024/25 winter season the area had occurrences of collared elk (Wildlife Migration Initiative). Over 70% of sagebrush plants sampled in density strips showed signs of moderate to heavy use in 2005, 2010, 2015, and 2025 (Table 10R-07.9, Table 10R-07.13). On-site observations in 2025 noted little to no utilization of the herbaceous community.

## Trend Summary Tables

**Table 10R-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 0.3 | 2.6 | - | - | - | - |
| 2000 | 0.1 | 2.5 | - | - | - | - |
| 2005 | 0.2 | 2.7 | - | 0.4 | 2.3 | - |
| 2010 | 0.5 | 6.0 | - | 0.7 | 4.5 | - |
| 2015 | 1.1 | 6.9 | - | 2.0 | 5.4 | - |
| 2020 | 3.1 | 4.7 | - | 3.1 | 2.7 | - |
| 2025 | 3.8 | 1.6 | - | 5.5 | 1.0 | - |

**Table 10R-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | - | 450 | 3 | 261 | - | 12.7 | 0.0 | 4.2 |
| 2000 | - | 408 | 3 | 244 | - | 16.4 | 0.0 | 7.6 |
| 2005 | - | 412 | - | 142 | - | 27.2 | - | 2.4 |
| 2010 | - | 398 | 26 | 185 | - | 34.1 | 0.1 | 2.3 |
| 2015 | - | 411 | 38 | 249 | - | 20.5 | 0.1 | 4.3 |
| 2020 | - | 398 | 89 | 243 | - | 30.7 | 0.8 | 4.5 |
| 2025 | - | 379 | 86 | 204 | - | 31.5 | 0.5 | 3.9 |

**Table 10R-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 13.5 | 3.0 | 24.0 | 8.0 | 7.6 | 23.1 |
| 2000 | 26.1 | 6.5 | 23.1 | 1.0 | 7.8 | 32.0 |
| 2005 | 39.3 | 0.3 | 28.4 | 3.8 | 6.4 | 31.0 |
| 2010 | 29.3 | 0.0 | 33.7 | 3.7 | 7.9 | 45.4 |
| 2015 | 42.3 | 0.7 | 24.5 | 2.5 | 7.8 | 33.8 |
| 2020 | 34.8 | 0.1 | 35.3 | 4.5 | 7.3 | 43.3 |
| 2025 | 31.4 | 0.1 | 32.2 | 5.7 | 7.1 | 40.7 |

**Table 10R-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1997 | 1 | 2 | 53 | 1 |
| 2000 | 1 | 5 | 65 | 10 |
| 2005 | 11 | 25 | 78 | 53 |
| 2010 | 8 | 17 | 36 | 17 |
| 2015 | 3 | 10 | 37 | 14 |
| 2020 | 5 | 18 | 29 | 11 |
| 2025 | 4 | 16 | 32 | 17 |
| Year | Days Use Per Acre (ha) | | | |
| 1997 | - | - | - | - |
| 2000 | 2.2 (5.4) | 11.4 (28.1) | 71.7 (177.1) | - |
| 2005 | 11.6 (28.7) | 9.4 (23.2) | 92.5 (228.4) | - |
| 2010 | 8.0 (19.7) | 20.8 (51.3) | 34.2 (84.4) | - |
| 2015 | 4.4 (10.8) | 8.1 (19.9) | 34.2 (84.4) | - |
| 2020 | 13.1 (32.3) | 4.7 (11.6) | 31.5 (77.8) | - |
| 2025 | 2.9 (7.2) | 4.7 (11.6) | 32.8 (81.1) | - |

**Table 10R-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1997 | 6 | 444 | 5 | 13 | 5 | 5 | 22 | 3 |
| 2000 | 2 | 405 | - | 20 | 2 | - | - | 1 |
| 2005 | 15 | 410 | - | 14 | - | 3 | 7 | 1 |
| 2010 | 12 | 391 | - | - | 11 | 3 | 13 | 13 |
| 2015 | 3 | 408 | - | 5 | 8 | - | 5 | 12 |
| 2020 | 7 | 394 | - | 4 | - | 1 | 2 | 3 |
| 2025 | 3 | 369 | 13 | 8 | 3 | 13 | - | 10 |
| year | Average Cover (%) | | | | | | | |
| 1997 | 0.1 | 12.1 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 |
| 2000 | 0.0 | 16.1 | - | 0.3 | 0.0 | - | - | 0.0 |
| 2005 | 0.3 | 26.7 | - | 0.1 | - | 0.1 | 0.0 | 0.0 |
| 2010 | 0.1 | 32.9 | - | - | 0.4 | 0.1 | 0.4 | 0.2 |
| 2015 | 0.0 | 20.3 | - | 0.1 | 0.1 | - | 0.0 | 0.0 |
| 2020 | 0.2 | 30.4 | - | 0.0 | - | 0.0 | 0.0 | 0.0 |
| 2025 | 0.0 | 30.0 | 0.8 | 0.4 | 0.0 | 0.3 | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Antennaria parvifolia (small-leaf pussytoes) | Arabis demissa (nodding rockcress) | Arabis holboellii[a] (Holboell's rockcress) | Arenaria fendleri (Fendler's sandwort) | Artemisia dracunculus (tarragon) | Astragalus spatulatus (tufted milkvetch) | Ceratocephala testiculata[ai] (curveseed butterwort) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Heterotheca villosa (hairy false goldenaster) | Lithospermum ruderale (western stoneseed) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Penstemon pachyphyllus (thickleaf beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | - | 2 | 37 | - | - | 5 | 155 | - | 7 | 3 | - | 46 | - | - | - | - | 28 |
| 2000 | - | 13 | 17 | - | 5 | 26 | 162 | - | - | - | - | 17 | - | - | 9 | 3 | 28 |
| 2005 | - | 5 | 2 | - | 2 | 12 | 53 | - | - | - | - | 11 | - | - | 0 | - | - |
| 2010 | 25 | 8 | 6 | - | 36 | 7 | 37 | - | - | - | - | 6 | - | - | 0 | 1 | - |
| 2015 | 27 | 5 | 25 | - | 5 | 5 | 107 | - | - | - | 11 | 26 | - | 6 | 8 | - | 16 |
| 2020 | 81 | 3 | 11 | - | - | - | 72 | 9 | 22 | - | - | 53 | - | - | 12 | - | 1 |
| 2025 | 86 | - | 12 | 3 | - | 0 | 49 | - | - | - | 1 | 23 | 10 | - | 10 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | - | 0.0 | 0.1 | - | - | 0.1 | 2.4 | - | 0.0 | 0.0 | - | 0.5 | - | - | - | - | 0.1 |
| 2000 | - | 0.1 | 0.1 | - | 0.0 | 0.6 | 5.9 | - | - | - | - | 0.0 | - | - | 0.1 | 0.0 | 0.4 |
| 2005 | - | 0.1 | 0.0 | - | 0.0 | 0.1 | 1.2 | - | - | - | - | 0.1 | - | - | 0.0 | - | - |
| 2010 | 0.1 | 0.0 | 0.0 | - | 0.5 | 0.2 | 0.5 | - | - | - | - | 0.1 | - | - | 0.0 | 0.0 | - |
| 2015 | 0.1 | 0.1 | 0.1 | - | 0.0 | 0.1 | 2.2 | - | - | - | 0.0 | 0.3 | - | 0.0 | 0.0 | - | 0.3 |
| 2020 | 0.8 | 0.0 | 0.0 | - | - | - | 1.3 | 0.0 | 0.1 | - | - | 0.4 | - | - | 0.1 | - | 0.0 |
| 2025 | 0.5 | - | 0.0 | 0.0 | - | 0.0 | 1.5 | - | - | - | 0.0 | 0.1 | 0.1 | - | 0.1 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Phlox longifolia (longleaf phlox) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1997 | 1 | 10 | 106 | 13 | - | - | - | - |
| 2000 | 2 | - | 67 | - | 1 | 7 | - | 3 |
| 2005 | - | 3 | 81 | 2 | - | 1 | - | - |
| 2010 | 5 | 11 | 110 | 2 | - | 4 | - | 1 |
| 2015 | 3 | - | 148 | 3 | - | 11 | - | - |
| 2020 | 12 | - | 144 | 1 | - | 3 | 4 | 3 |
| 2025 | 10 | 5 | 138 | 2 | - | 3 | 1 | - |
| year | Average Cover (%) | | | | | | | |
| 1997 | 0.0 | 0.0 | 0.7 | 0.2 | - | - | - | - |
| 2000 | 0.0 | - | 0.4 | - | 0.0 | 0.0 | - | 0.0 |
| 2005 | - | 0.0 | 0.9 | 0.0 | - | 0.0 | - | - |
| 2010 | 0.0 | 0.1 | 0.9 | 0.0 | - | 0.0 | - | 0.0 |
| 2015 | 0.0 | - | 1.2 | 0.1 | - | 0.0 | - | - |
| 2020 | 0.1 | - | 2.4 | 0.1 | - | 0.0 | 0.0 | 0.0 |
| 2025 | 0.0 | 0.1 | 1.6 | 0.4 | - | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Ericameria nauseosa ssp. consimilis (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia (pricklypear) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 0.1 | - | 0.3 | - | - | 0.9 | 1.4 | - |
| 2010 | 0 | - | 0.7 | 0 | - | 1.2 | 3.3 | - |
| 2015 | 0.2 | 0.4 | 1.1 | 0.3 | - | 0.7 | 4.7 | - |
| 2020 | 0.3 | 0.7 | 1.8 | 0.3 | - | 1 | 1.7 | - |
| 2025 | 0.4 | 1.3 | 3.2 | 0.6 | - | 0.3 | 0.7 | - |
| year | Quadrat Cover (%) | | | | | | | |
| 1997 | 0.1 | - | 0.2 | - | 0.0 | 0.3 | 2.3 | - |
| 2000 | 0.1 | - | 0.0 | - | - | 0.8 | 1.8 | - |
| 2005 | 0.1 | - | 0.1 | - | - | 1.3 | 1.5 | 0.0 |
| 2010 | 0.1 | - | 0.4 | 0.0 | - | 1.0 | 5.0 | - |
| 2015 | 0.4 | 0.0 | 0.7 | 0.0 | - | 1.6 | 5.2 | 0.1 |
| 2020 | 0.5 | 0.6 | 2.1 | 0.0 | - | 1.5 | 3.0 | 0.1 |
| 2025 | 0.8 | 1.0 | 2.0 | 0.0 | - | 0.7 | 0.9 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 73/92 |
| 2020 | - | - | - | - | - | - | - | - | 106/131 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1997 | 380 | 40 | 42 | 53 | 5 | 0 | 0 | 5 | 18/19 |
| 2000 | 620 | 40 | 42 | 55 | 3 | 0 | 0 | 3 | 7/13 |
| 2005 | 380 | 40 | 26 | 74 | 0 | 0 | 0 | 0 | 10/12 |
| 2010 | 700 | 60 | 17 | 83 | 0 | 3 | 23 | 0 | 10/18 |
| 2015 | 900 | 80 | 40 | 60 | 0 | 7 | 0 | 0 | 12/21 |
| 2020 | 500 | 60 | 16 | 84 | 0 | 16 | 0 | 16 | 12/17 |
| 2025 | 620 | 80 | 3 | 97 | 0 | 7 | 0 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 21/50 |
| 2015 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 19/50 |
| 2020 | 380 | 220 | 74 | 26 | 0 | 21 | 21 | 5 | 25/47 |
| 2025 | 520 | 40 | 46 | 54 | 0 | 31 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1997 | 120 | 20 | 50 | 50 | 0 | 33 | 0 | 0 | 36/52 |
| 2000 | 160 | - | 38 | 63 | 0 | 50 | 13 | 0 | 33/52 |
| 2005 | 140 | 80 | 0 | 100 | 0 | 14 | 57 | 0 | 38/61 |
| 2010 | 300 | - | 20 | 80 | 0 | 27 | 47 | 0 | 39/66 |
| 2015 | 360 | 80 | 72 | 28 | 0 | 67 | 17 | 0 | 45/87 |
| 2020 | 440 | 40 | 32 | 68 | 0 | 36 | 9 | 5 | 49/94 |
| 2025 | 560 | - | 29 | 68 | 4 | 11 | 68 | 14 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1997 | 60 | - | 0 | 67 | 33 | 0 | 100 | 0 | 60/93 |
| 2000 | 40 | - | 0 | 0 | 100 | 50 | 50 | 100 | 99/109 |
| 2005 | 60 | - | 33 | 33 | 33 | 0 | 100 | 0 | 86/97 |
| 2010 | 60 | - | 33 | 33 | 33 | 0 | 67 | 0 | 77/96 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 93/107 |
| 2020 | 20 | 460 | 100 | 0 | 0 | 0 | 100 | 0 | 100/112 |
| 2025 | 80 | - | 50 | 50 | 0 | 25 | 50 | 0 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa ssp. consimilis -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 38/51 |
| 2000 | 120 | - | 67 | 0 | 33 | 0 | 0 | 17 | 60/83 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 25 | 0 | 54/68 |
| 2010 | 80 | - | 25 | 75 | 0 | 50 | 0 | 25 | 56/69 |
| 2015 | 200 | - | 20 | 40 | 40 | 20 | 20 | 70 | 57/74 |
| 2020 | 100 | - | 40 | 60 | 0 | 20 | 0 | 0 | 51/71 |
| 2025 | 180 | - | 78 | 22 | 0 | 11 | 0 | 44 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 15900 | 140 | 20 | 81 | 0 | 0 | 0 | 0 | 12/13 |
| 2000 | 14320 | 180 | 15 | 81 | 4 | 0 | 0 | 2 | 9/13 |
| 2005 | 11680 | 2220 | 30 | 69 | 1 | 0 | 0 | 1 | 12/14 |
| 2010 | 16400 | 1460 | 23 | 77 | 0 | 3 | 0 | 1 | 12/16 |
| 2015 | 25720 | 10740 | 31 | 67 | 2 | 25 | 0 | 2 | 12/16 |
| 2020 | 10600 | 7040 | 61 | 39 | 1 | 0 | 0 | 3 | 11/12 |
| 2025 | 3340 | 20 | 5 | 86 | 9 | 19 | 1 | 6 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/8 |
| 2010 | - | - | - | - | - | - | - | - | 13/34 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 50 | 9/24 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/34 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 40/124 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

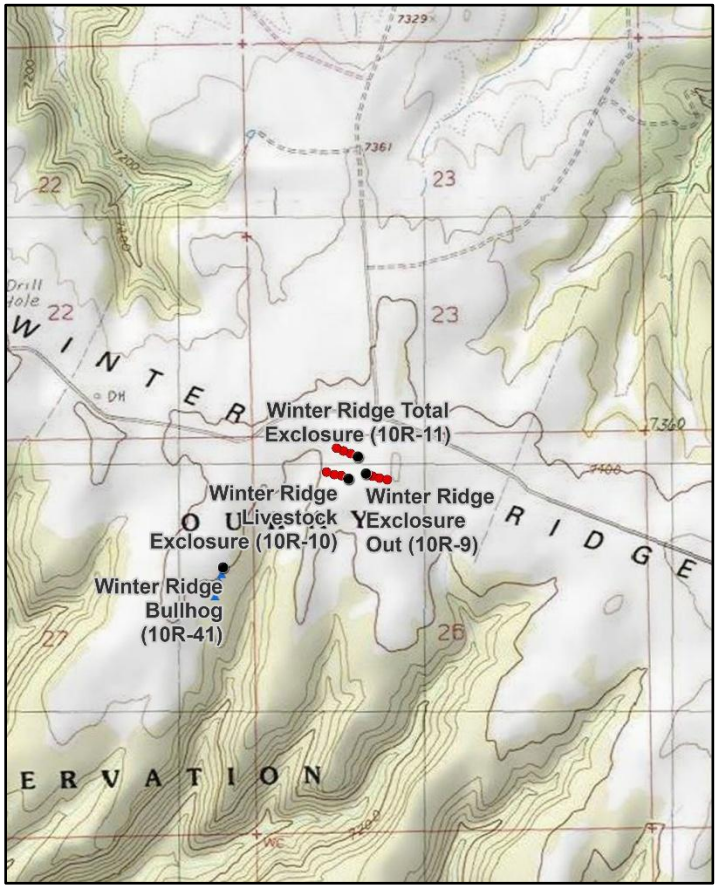
**Table 10R-07.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

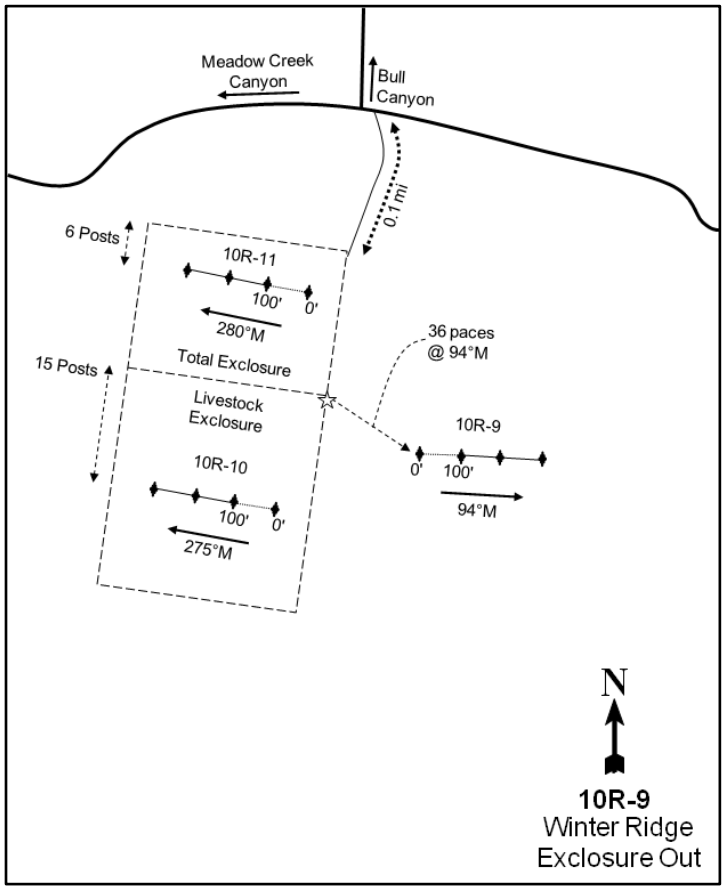
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 3 | - | - | - | - | - | 3.7 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 2 | - | - | - | - | - | 2.7 |
| 2015 | 8 | 17 | 67 | 17 | - | - | 3.0 |
| 2020 | 1 | 100 | - | - | - | - | 1.0 |
| 2025 | 3 | - | 100 | - | - | - | 1.3 |

**Table 10R-07.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 0.4 | 0.0 | 0.0 | 25.4 | 0.0 | 8.4 | 0.0 | **34.2** | Very Poor |
| 2000 | 0.1 | 0.0 | 0.0 | 30.0 | 0.0 | 10.0 | 0.0 | **40.1** | Very Poor-Poor |
| 2005 | 0.5 | 0.0 | 0.0 | 30.0 | 0.0 | 4.7 | 0.0 | **35.2** | Very Poor |
| 2010 | 0.9 | 0.0 | 0.0 | 30.0 | 0.0 | 4.7 | 0.0 | **35.6** | Very Poor |
| 2015 | 2.5 | 0.0 | 0.0 | 30.0 | 0.0 | 8.7 | 0.0 | **41.2** | Very Poor-Poor |
| 2020 | 3.9 | 0.0 | 0.0 | 30.0 | 0.0 | 9.1 | 0.0 | **43.0** | Poor |
| 2025 | 6.9 | 14.3 | 15.0 | 30.0 | 0.0 | 7.7 | 0.0 | **73.9** | Good |

# WINTER RIDGE EXCLOSURE OUT - STUDY NO. 10R-9




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tenmile Canyon North; Township 15S, Range 21E, Section 26 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 625704 East 4372166 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 63 |
| Transect Bearing | 128° magnetic |
| Length | 300ft |
| Belt Placement | Line 1 (11ft & 71ft), Line 2 (34ft & 95ft), Line 3 (59ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of Seep Ridge Road and the Book Cliff Divide Road, proceed west along the Divide Road for 9.4 miles to the Three Pines-Hay Canyon major intersection. Drive west along the Winter Ridge Road for 9.8 miles to a fork. From the intersection where Meadow Creek Canyon and Bull Canyon meet, take the road to the south. Go 0.1 miles to the Winter Ridge Exclosure. From the "T" in the fence on the west side of the exclosure where the two parts of the exclosure meet, walk 36 paces at 130 degrees magnetic to the 0-foot stake that is marked by browse tag #63.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | HORSE POINT |
| Elevation | 7,420ft (2,262m) |
| Aspect | West |
| Slope | 3-5% |
| Sample Dates | 06/05/1997, 06/20/2000, 06/14/2005, 06/23/2010, 06/10/2015, 06/09/2020, 06/03/2025 |

**Table 10R-09.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Lop and Scatter - Hand Crew | Wolf Point Lop and Scatter | 259 | April 2006 | 811 |
| Lop and Scatter - Hand Crew | Willow Watershed Improvements FY2023 | 5934 | September 2022-June 2024 | 3791 |

## Wildlife Habitat and Vegetation History

**Table 10R-09.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | substantial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | substantial | summer |

**Table 10R-09.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2000 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2010 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2015 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

The study is located outside of the exclosure complex on Winter Ridge that was constructed in 1964.

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1997-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1997, the plant community on this site has been dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a diverse herbaceous understory; other shrub species have been present, but they have provided much less cover (Table 10R-09.12). Native perennial grasses have been the dominant herbaceous component throughout the duration of the study and have included western wheatgrass (*Pascopyrum smithii*), prairie junegrass (*Koeleria macrantha*), and blue grama (*Bouteloua gracilis*), among others (Table 10R-09.10). Forbs have remained diverse and have contributed fluctuating amounts of cover from year to year (Table 10R-09.11). Twoneedle pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and/or Rocky Mountain juniper (*J. scopulorum*) have been observed on this site in all sample years (Photos, Table 10R-09.12, Table 10R-09.14) despite lop and scatter treatments in 2006 and again in 2022-2024 (Table 10R-09.1); there may be potential for infilling over time. However, the site has remained in Early Phase I of woodland succession throughout the sample period (Table 10R-09.4), indicating that infilling is likely not an immediate concern.

This site's condition as mule deer winter range has ranged between poor and good since 1997; winter range condition was considered to be good in 2025. Factors that negatively influence condition as deer winter range include reduced preferred browse, and perennial grass and forb cover (Table 10R-09.6, Table 10R-09.7, Table 10R-09.15). According to pellet transect data deer presence has been low over the course of the study, while elk presence has ranged between low and moderate. Horse presence has been increasing since 2005 and was considered to be high in 2025. Over 70% of sagebrush plants sampled in density strips have shown signs of moderate to heavy use in 1997, 2000, and 2015 (Table 10R-09.9, Table 10R-09.13). On-site observations state that there was heavy utilization (greater than 40%) of the perennial grass community during the most recent sample year (2025). In addition, the perennial forb and preferred browse communities appeared to be adversely affected by drought (Photos, Table 10R-09.9, Table 10R-09.10, Table 10R-09.11). Prolonged exposure to heavy utilization in combination with drought could reduce the long term utility of the site for wildlife.

## Trend Summary Tables

**Table 10R-09.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 13.0 | 0.2 | 0.0 | - | - | - |
| 2000 | 15.7 | 2.5 | - | - | - | - |
| 2005 | 9.3 | 10.3 | 0.1 | 9.4 | 13.1 | - |
| 2010 | 6.2 | 1.2 | 0.4 | 9.7 | 2.0 | 0.4 |
| 2015 | 9.9 | 2.6 | 1.0 | 11.1 | 1.2 | 0.5 |
| 2020 | 13.7 | 3.9 | 0.6 | 14.5 | 1.3 | 0.3 |
| 2025 | 14.5 | 2.9 | - | 16.3 | 2.3 | - |

**Table 10R-09.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | - | 435 | 17 | 287 | - | 10.8 | 0.0 | 5.0 |
| 2000 | - | 442 | 2 | 291 | - | 16.0 | 0.0 | 6.2 |
| 2005 | - | 409 | 1 | 200 | - | 17.1 | 0.0 | 3.6 |
| 2010 | - | 423 | 3 | 237 | - | 14.3 | 0.0 | 4.3 |
| 2015 | - | 431 | 12 | 278 | - | 18.1 | 0.0 | 5.4 |
| 2020 | - | 411 | 18 | 268 | - | 16.5 | 0.2 | 5.5 |
| 2025 | - | 400 | 2 | 239 | - | 10.4 | 0.0 | 3.9 |

**Table 10R-09.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 31.2 | 15.8 | 25.0 | 0.5 | 0.1 | 31.6 |
| 2000 | 35.0 | 12.2 | 32.8 | 0.2 | 0.0 | 40.2 |
| 2005 | 42.5 | 1.8 | 29.7 | 0.1 | 0.1 | 37.1 |
| 2010 | 34.0 | 0.4 | 42.1 | 0.0 | 0.0 | 35.1 |
| 2015 | 42.9 | 1.3 | 35.8 | 0.1 | 0.0 | 41.0 |
| 2020 | 38.4 | 0.2 | 42.6 | 0.1 | 0.0 | 41.5 |
| 2025 | 54.5 | 0.1 | 35.6 | 0.4 | 0.0 | 27.8 |

**Table 10R-09.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1997 | 2 | 4 | 24 | - | 14 |
| 2000 | 3 | 9 | 15 | - | 5 |
| 2005 | 8 | 9 | 24 | 5 | 20 |
| 2010 | 4 | - | 10 | 9 | 7 |
| 2015 | 5 | 7 | 16 | 1 | 3 |
| 2020 | 4 | 7 | 4 | 10 | 9 |
| 2025 | 4 | 5 | 1 | 19 | 11 |
| Year | Days Use Per Acre (ha) | | | | |
| 1997 | - | - | - | - | - |
| 2000 | 19.6 (48.4) | 2.0 (5.0) | 22.1 (54.6) | - | - |
| 2005 | 6.5 (16.1) | 2.0 (5.0) | 32.2 (79.5) | 5.2 (12.9) | - |
| 2010 | 2.2 (5.4) | 13.4 (33.1) | 1.3 (3.3) | 4.0 (10.0) | - |
| 2015 | 24.0 (59.2) | 5.3 (13.2) | 26.2 (64.6) | 5.2 (12.9) | - |
| 2020 | 3.6 (9.0) | 3.4 (8.3) | 1.3 (3.3) | 7.5 (18.6) | - |
| 2025 | 8.0 (19.7) | 2.0 (5.0) | 0.7 (1.7) | 29.0 (71.7) | - |

**Table 10R-09.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Bouteloua gracilis (blue grama) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1997 | 26 | 56 | 152 | 340 | 171 | 191 |
| 2000 | 37 | 11 | 45 | 324 | 249 | 251 |
| 2005 | 39 | 177 | 84 | 296 | 184 | 43 |
| 2010 | 59 | 202 | 186 | 247 | 79 | 79 |
| 2015 | 46 | 114 | 150 | 332 | 81 | 119 |
| 2020 | 40 | 67 | 224 | 277 | 67 | 104 |
| 2025 | 49 | 11 | 67 | 356 | 7 | 99 |
| year | Average Cover (%) | | | | | |
| 1997 | 0.9 | 0.3 | 1.8 | 3.0 | 2.8 | 2.1 |
| 2000 | 1.7 | 0.1 | 0.5 | 4.0 | 6.0 | 3.7 |
| 2005 | 2.4 | 4.3 | 1.8 | 4.9 | 3.3 | 0.5 |
| 2010 | 1.6 | 3.9 | 4.3 | 3.2 | 0.8 | 0.6 |
| 2015 | 1.4 | 2.5 | 3.9 | 7.8 | 0.8 | 1.7 |
| 2020 | 1.7 | 1.1 | 5.3 | 5.8 | 1.4 | 1.2 |
| 2025 | 1.7 | 0.2 | 1.3 | 5.8 | 0.1 | 1.4 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-09.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Antennaria dimorpha (low pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus lentiginosus (freckled milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja flava (yellow Indian paintbrush) | Crepis intermedia (limestone hawksbeard) | Cryptantha (cryptantha) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum alatum (winged buckwheat) | Lithospermum (stoneseed) | Lygodesmia grandiflora (largeflower skeletonplant) | Machaeranthera grindelioides (rayless tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | - | 28 | 17 | - | 12 | - | - | 7 | - | 4 | 4 | 30 | - | - | - | 1 | - |
| 2000 | - | 25 | 2 | 3 | 10 | - | - | 3 | - | - | - | 16 | 48 | - | 2 | - | - |
| 2005 | 0 | 1 | 1 | - | 9 | 1 | - | - | - | 1 | 6 | - | 14 | 4 | - | - | 2 |
| 2010 | - | 7 | - | 2 | 19 | - | 5 | 0 | 8 | 1 | 7 | 6 | 21 | 2 | - | - | 2 |
| 2015 | - | 6 | 4 | - | 14 | - | - | - | - | 1 | 17 | - | 42 | - | - | - | 3 |
| 2020 | - | 11 | 18 | - | 5 | - | - | 10 | 3 | - | 23 | 0 | 55 | 3 | - | 1 | 4 |
| 2025 | - | 5 | 2 | 4 | 16 | - | - | - | - | - | 13 | - | 21 | 4 | - | - | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | - | 0.5 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | 0.1 | - | - | - | 0.0 | - |
| 2000 | - | 0.3 | 0.0 | 0.0 | 0.1 | - | - | 0.0 | - | - | - | 0.1 | 0.2 | - | 0.0 | - | - |
| 2005 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.1 | 0.0 | - | - | 0.0 |
| 2010 | - | 0.1 | - | 0.0 | 0.3 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | - | - | 0.1 |
| 2015 | - | 0.2 | 0.0 | - | 0.1 | - | - | - | - | 0.0 | 0.0 | - | 0.3 | - | - | - | 0.0 |
| 2020 | - | 0.3 | 0.2 | - | 0.1 | - | - | 0.2 | 0.0 | - | 0.1 | 0.0 | 0.3 | 0.1 | - | 0.0 | 0.0 |
| 2025 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | - | - | - | 0.1 | - | 0.1 | 0.0 | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon caespitosus (mat penstemon) | Petradoria pumila (rock goldenrod) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Sphaeralcea coccinea (scarlet globemallow) | Sphaeralcea grossulariifolia (gooseberryleaf globemallow) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1997 | 64 | - | 190 | 56 | 22 | 78 | - | - | - | - |
| 2000 | 54 | 3 | 228 | 22 | 16 | 104 | - | - | - | - |
| 2005 | - | - | 65 | 6 | 19 | 126 | - | 6 | 4 | - |
| 2010 | 6 | - | 86 | 41 | 15 | 138 | - | 13 | 4 | 3 |
| 2015 | 25 | - | 102 | 48 | 80 | 150 | 2 | 11 | - | 8 |
| 2020 | 18 | 2 | 98 | 73 | 8 | 114 | 3 | 5 | 14 | - |
| 2025 | 18 | - | 95 | 70 | 28 | 98 | - | 3 | 12 | - |
| year | Average Cover (%) | | | | | | | | | |
| 1997 | 1.0 | - | 2.2 | 0.2 | 0.1 | 0.7 | - | - | - | - |
| 2000 | 0.9 | 0.0 | 3.5 | 0.1 | 0.3 | 0.6 | - | - | - | - |
| 2005 | - | - | 0.6 | 0.0 | 0.1 | 2.5 | - | 0.1 | 0.0 | - |
| 2010 | 0.1 | - | 1.1 | 0.1 | 0.1 | 1.8 | - | 0.2 | 0.0 | 0.0 |
| 2015 | 0.4 | - | 1.5 | 0.1 | 0.6 | 1.8 | 0.0 | 0.2 | - | 0.0 |
| 2020 | 0.1 | 0.0 | 2.0 | 0.5 | 0.0 | 1.3 | 0.0 | 0.1 | 0.0 | - |
| 2025 | 0.1 | - | 1.9 | 0.3 | 0.1 | 1.0 | - | 0.0 | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-09.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1997 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2005 | 9.3 | 0.1 | - | 13.1 | - | - | - |
| 2010 | 9.5 | 0.2 | 0.1 | 1.9 | - | - | 0.4 |
| 2015 | 10.7 | 0.4 | - | 1.2 | - | 0 | 0.5 |
| 2020 | 14.4 | 0.1 | - | 1.3 | - | - | 0.3 |
| 2025 | 16.1 | 0.2 | - | 2.3 | 0 | - | - |
| year | Quadrat Cover (%) | | | | | | |
| 1997 | 12.9 | 0.2 | - | 0.2 | 0.0 | 0.0 | 0.0 |
| 2000 | 15.5 | 0.2 | 0.0 | 2.5 | - | 0.0 | - |
| 2005 | 9.2 | 0.1 | - | 10.3 | 0.0 | - | 0.1 |
| 2010 | 5.8 | 0.4 | 0.0 | 1.2 | 0.0 | - | 0.4 |
| 2015 | 9.5 | 0.4 | - | 2.6 | 0.0 | 0.0 | 1.0 |
| 2020 | 13.3 | 0.4 | 0.0 | 3.9 | - | 0.0 | 0.6 |
| 2025 | 14.2 | 0.3 | - | 2.8 | 0.0 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-09.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 23/19 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 60 | - | 33 | 67 | 0 | 33 | 33 | 0 | 59/72 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1997 | 6920 | 40 | 3 | 73 | 24 | 53 | 25 | 10 | 53/68 |
| 2000 | 7960 | 60 | 8 | 41 | 51 | 44 | 30 | 20 | 51/57 |
| 2005 | 5140 | 1100 | 3 | 56 | 42 | 49 | 9 | 27 | 49/57 |
| 2010 | 5080 | 600 | 25 | 41 | 34 | 42 | 26 | 19 | 51/63 |
| 2015 | 4980 | 180 | 16 | 68 | 17 | 38 | 39 | 27 | 47/58 |
| 2020 | 4740 | 120 | 30 | 48 | 22 | 28 | 5 | 24 | 55/68 |
| 2025 | 6360 | 1320 | 25 | 61 | 14 | 31 | 8 | 14 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1997 | 260 | - | 15 | 85 | 0 | 0 | 0 | 0 | 9/17 |
| 2000 | 420 | - | 24 | 62 | 14 | 0 | 5 | 10 | 8/18 |
| 2005 | 280 | - | 0 | 86 | 14 | 100 | 0 | 0 | 7/18 |
| 2010 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/21 |
| 2015 | 560 | - | 18 | 82 | 0 | 18 | 43 | 4 | 11/21 |
| 2020 | 500 | - | 4 | 96 | 0 | 20 | 8 | 0 | 9/23 |
| 2025 | 840 | - | 5 | 95 | 0 | 2 | 95 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 140 | - | 71 | 29 | 0 | 0 | 0 | 0 | 16/17 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/14 |
| 2020 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 8/7 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 1440 | - | 11 | 89 | 0 | 0 | 0 | 0 | 11/14 |
| 2000 | 19460 | 1140 | 28 | 72 | 0 | 0 | 0 | 0 | 10/11 |
| 2005 | 29480 | 520 | 13 | 87 | 0 | 0 | 0 | 0 | 18/22 |
| 2010 | 8360 | 880 | 53 | 46 | 1 | 0 | 0 | 1 | 13/14 |
| 2015 | 12280 | 4820 | 41 | 58 | 1 | 19 | 3 | 1 | 17/18 |
| 2020 | 11580 | 40 | 9 | 89 | 2 | 0 | 0 | 3 | 11/13 |
| 2025 | 13940 | - | 14 | 85 | 1 | 4 | 0 | 1 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/16 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 10/12 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 100 | 0 | 9/11 |
| 2010 | 80 | - | 25 | 75 | 0 | 25 | 0 | 0 | 14/21 |
| 2015 | 40 | - | 50 | 0 | 50 | 0 | 0 | 50 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 60 | - | 0 | 33 | 67 | 0 | 100 | 67 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 11/12 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1997 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 3/7 |
| 2000 | 200 | - | 50 | 50 | 0 | 0 | 0 | 0 | 2/5 |
| 2005 | 300 | - | 0 | 100 | 0 | 0 | 0 | 0 | 2/6 |
| 2010 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 3/5 |
| 2015 | 120 | 40 | 67 | 33 | 0 | 0 | 0 | 0 | 6/8 |
| 2020 | 140 | 20 | 43 | 57 | 0 | 0 | 0 | 0 | 3/6 |
| 2025 | 120 | 20 | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | - | 50 | 0 | 50 | 0 | 0 | 100 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 20/22 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

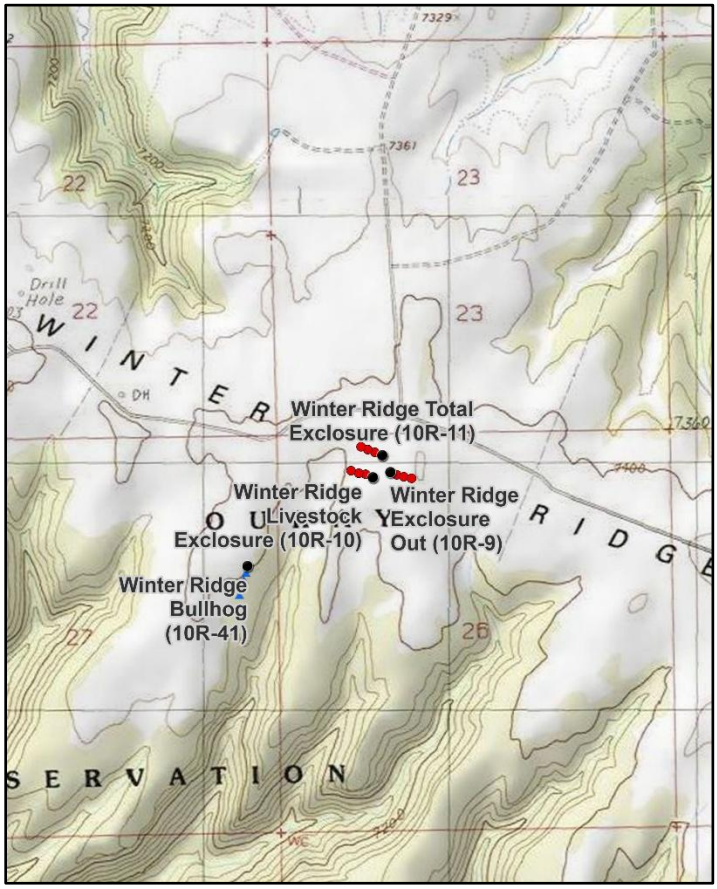
**Table 10R-09.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

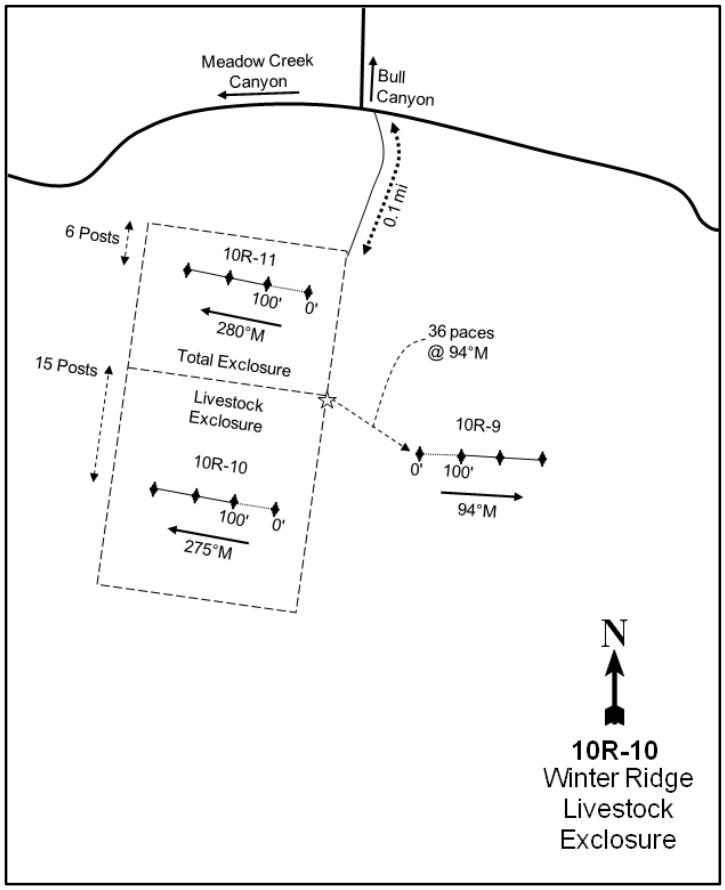
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 8 | - | - | - | - | - | 8.0 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 1 | - | 100 | - | - | - | 3.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 17 | - | - | - | - | - | 6.9 |
| 2015 | 26 | - | 100 | - | - | - | 3.4 |
| 2020 | 57 | 23 | 62 | 15 | - | - | 3.6 |
| 2025 | 7 | - | 100 | - | - | - | 3.0 |

**Table 10R-09.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 16.3 | 7.9 | 1.7 | 21.7 | 0.0 | 9.9 | 0.0 | **57.5** | Fair |
| 2000 | 19.6 | -0.3 | 4.2 | 30.0 | 0.0 | 10.0 | 0.0 | **63.5** | Fair |
| 2005 | 11.8 | 2.6 | 1.3 | 30.0 | 0.0 | 7.2 | 0.0 | **52.9** | Poor |
| 2010 | 12.1 | 4.9 | 12.1 | 28.6 | 0.0 | 8.6 | 0.0 | **66.3** | Fair |
| 2015 | 13.9 | 10.2 | 8.1 | 30.0 | 0.0 | 10.0 | 0.0 | **72.2** | Good |
| 2020 | 18.1 | 8.5 | 15.0 | 30.0 | 0.0 | 10.0 | 0.0 | **81.6** | Good |
| 2025 | 20.4 | 10.9 | 12.5 | 20.8 | 0.0 | 7.8 | 0.0 | **72.4** | Good |

# WINTER RIDGE LIVESTOCK EXCLOSURE - STUDY NO. 10R-10




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tenmile Canyon North; Township 15S, Range 21E, Section 26 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 625633 East 4372145 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 76 |
| Transect Bearing | 275° magnetic |
| Length | 300ft |
| Belt Placement | Line 1 (11ft & 71ft), Line 2 (34ft & 95ft), Line 3 (59ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of the Seep Ridge and Book Cliff Divide roads, proceed west along the divide for 9.4 miles to the major Three Pines-Hay Canyon intersection. Drive west along Winter Ridge Road for 9.8 miles to a fork. From the intersection where Meadow Creek Canyon and Bull Canyon meet, take the road to the south. Go 0.1 miles to the Winter Ridge Exclosure. Go to the northwest corner of the livestock part of the exclosure: from there, walk down 15 posts, and the 300-foot stake is to the east. The 0-foot stake is on the east end and marked by browse tag #76.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | HORSE POINT |
| Elevation | 7,400ft (2,256m) |
| Aspect | West |
| Slope | 4-6% |
| Sample Dates | 06/05/1997, 06/20/2000, 06/14/2005, 06/10/2015, 06/09/2020, 06/04/2025 |

**Table 10R-10.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Lop and Scatter - Hand Crew | Wolf Point Lop and Scatter | 259 | April 2006 | 811 |
| Lop and Scatter - Hand Crew | Willow Watershed Improvement FY2023 | 5934 | September 2022 - June 2024 | 3791 |

## Wildlife Habitat and Vegetation History

**Table 10R-10.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | substantial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | substantial | summer |

**Table 10R-10.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2000 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2015 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10R-10.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.2 | 35.6 | 38.8 | 25.6 | 1.4 | 5.4 | 3.2 | 0.5 | 06/05/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush*) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1997-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1997, this site has remained in a stable state as a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*)-dominated plant community with a diverse herbaceous understory (Table 10R-10.12, Table 10R-10.13). Western wheatgrass (*Pascopyrum smithii*), Sandberg bluegrass (*Poa secunda*), and prairie junegrass (*Koeleria macrantha*) have generally contributed a majority of the perennial grass cover over the study period, although other species have also been present (Table 10R-10.10). Perennial forbs have remained moderately abundant (Table 10R-10.11).

This site's condition as mule deer winter range has ranged between fair and good since 1997; winter range condition was considered to be fair-good in 2025. Factors that negatively influence condition as deer winter range include reduced preferred browse cover and recruitment, and reduced perennial grass cover (Table 10R-10.11, Table 10R-10.12, Table 10R-10.13, Table 10R-10.15). According to pellet transect data deer presence has been low over the course of the study, while elk presence has ranged from low to high. Horse presence has been increasing since 2005 and was considered moderate in 2025. Despite some downed fencing, the exclosure is likely having some effect on reducing the presence of wildlife, horses, and cattle and/or bison. Ninety percent of sagebrush plants sampled in density strips showed signs of moderate to heavy use in 2015 (Table 10R-10.9, Table 10R-10.13). On-site observations state that there was little utilization of the herbaceous community during the most recent sample year (2025). However, the perennial forb and preferred browse communities appeared to be adversely affected by drought (Photos, Table 10R-10.10, Table 10R-10.11).

## Trend Summary Tables

**Table 10R-10.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 14.3 | 0.1 | 0.1 | - | - | - |
| 2000 | 16.0 | 0.6 | 0.0 | - | - | - |
| 2005 | 12.5 | 3.5 | 0.0 | 15.9 | 3.4 | - |
| 2015 | 12.2 | 1.2 | 0.0 | 15.8 | 1.2 | - |
| 2020 | 14.3 | 1.8 | 0.0 | 17.0 | 1.1 | 0.1 |
| 2025 | 16.7 | 0.9 | - | 21.1 | 0.5 | - |

**Table 10R-10.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | - | 418 | 11 | 246 | - | 14.8 | 0.0 | 4.6 |
| 2000 | - | 446 | 2 | 125 | - | 18.5 | 0.0 | 2.1 |
| 2005 | - | 433 | - | 171 | - | 22.9 | - | 3.1 |
| 2015 | - | 426 | 14 | 241 | - | 21.8 | 0.0 | 5.8 |
| 2020 | - | 398 | 34 | 263 | - | 15.8 | 0.1 | 8.6 |
| 2025 | - | 366 | 13 | 236 | - | 8.5 | 0.0 | 6.1 |

**Table 10R-10.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 30.3 | 16.8 | 29.3 | 0.2 | 0.0 | 33.1 |
| 2000 | 31.0 | 2.1 | 30.5 | 0.0 | - | 46.8 |
| 2005 | 38.6 | 5.3 | 27.6 | 0.1 | 0.0 | 43.0 |
| 2015 | 39.3 | 4.0 | 33.8 | 0.1 | 0.0 | 43.6 |
| 2020 | 34.0 | 3.9 | 46.5 | 0.1 | 0.0 | 37.7 |
| 2025 | 50.2 | 2.1 | 34.5 | 0.1 | 0.0 | 27.7 |

**Table 10R-10.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1997 | - | - | 49 | - | 9 |
| 2000 | 1 | 3 | 22 | - | 4 |
| 2005 | 4 | 6 | 52 | - | 4 |
| 2015 | 3 | 3 | 18 | 1 | - |
| 2020 | 3 | 7 | 6 | 1 | 4 |
| 2025 | - | - | 2 | 16 | 2 |
| Year | Days Use Per Acre (ha) | | | | |
| 1997 | - | - | - | - | - |
| 2000 | - | 1.3 (3.3) | 28.1 (69.5) | - | - |
| 2005 | 1.5 (3.6) | 3.4 (8.3) | 79.8 (197.0) | - | - |
| 2015 | 11.6 (28.7) | 0.7 (1.7) | 22.1 (54.6) | 4.0 (10.0) | - |
| 2020 | 24.0 (59.2) | - | 8.7 (21.5) | 9.3 (23.0) | - |
| 2025 | 2.2 (5.4) | - | 1.3 (3.3) | 12.2 (30.1) | - |

**Table 10R-10.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bouteloua gracilis (blue grama) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1997 | - | 3 | 17 | 226 | 6 | 230 | - | 299 | 99 |
| 2000 | 6 | - | 15 | 227 | 10 | 255 | - | 158 | 99 |
| 2005 | 5 | - | 21 | 282 | 58 | 265 | 2 | 181 | 92 |
| 2015 | 37 | - | 18 | 254 | 70 | 231 | - | 41 | 202 |
| 2020 | 1 | 2 | 14 | - | 92 | 208 | 195 | 54 | 181 |
| 2025 | - | 2 | 22 | - | 35 | 191 | 248 | 50 | 128 |
| year | Average Cover (%) | | | | | | | | |
| 1997 | - | 0.1 | 0.3 | 0.9 | 0.1 | 3.7 | - | 7.9 | 1.8 |
| 2000 | 0.3 | - | 0.5 | 3.0 | 0.1 | 10.1 | - | 3.4 | 1.0 |
| 2005 | 0.0 | - | 1.1 | 4.4 | 2.1 | 8.6 | 0.0 | 5.3 | 1.3 |
| 2015 | 0.8 | - | 1.7 | 5.1 | 2.6 | 7.2 | - | 0.3 | 4.2 |
| 2020 | 0.0 | 0.1 | 0.6 | - | 3.4 | 4.4 | 2.5 | 1.2 | 3.7 |
| 2025 | - | 0.0 | 0.4 | - | 0.7 | 2.2 | 2.6 | 0.5 | 2.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-10.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Antennaria dimorpha (low pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (loosefloweer milkvetch) | Castilleja angustifolia (northwestern Indian paintbrush) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Ipomopsis aggregata (scarlet gilia) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon comarrhenus (dusty beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | - | 15 | 11 | - | 18 | - | 41 | 22 | 5 | 35 | - | - | - | 5 | - | 31 | - |
| 2000 | - | 18 | 2 | - | 5 | - | 7 | 10 | 14 | 13 | 8 | - | 2 | 6 | 3 | 4 | - |
| 2005 | 4 | 10 | - | - | 27 | - | 0 | 10 | 8 | 10 | 8 | - | - | 4 | 8 | 6 | - |
| 2015 | - | 15 | 14 | - | 25 | - | 20 | 12 | 23 | 8 | 41 | - | - | 14 | 8 | 19 | - |
| 2020 | 4 | 21 | 34 | 1 | 8 | - | 61 | 8 | 21 | 20 | 32 | 2 | 3 | 3 | - | 15 | - |
| 2025 | 3 | 25 | 13 | - | 23 | 1 | 6 | 5 | 14 | 16 | 13 | - | - | 1 | - | 13 | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | - | 0.2 | 0.0 | - | 0.1 | - | 0.7 | 0.3 | 0.0 | 0.2 | - | - | - | 0.1 | - | 0.6 | - |
| 2000 | - | 0.1 | 0.0 | - | 0.0 | - | 0.0 | 0.3 | 0.1 | 0.1 | 0.1 | - | 0.1 | 0.1 | 0.0 | 0.1 | - |
| 2005 | 0.1 | 0.1 | - | - | 0.6 | - | 0.0 | 0.3 | 0.0 | 0.1 | 0.1 | - | - | 0.1 | 0.2 | 0.1 | - |
| 2015 | - | 0.3 | 0.0 | - | 0.4 | - | 0.3 | 0.2 | 0.1 | 0.0 | 0.3 | - | - | 0.2 | 0.0 | 0.5 | - |
| 2020 | 0.0 | 0.4 | 0.1 | 0.0 | 0.1 | - | 1.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.5 | - |
| 2025 | 0.0 | 1.0 | 0.0 | - | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | - | - | 0.0 | - | 0.2 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1997 | 174 | 28 | 1 | - | 11 | - | - |
| 2000 | 55 | - | - | - | 12 | - | - |
| 2005 | 101 | 3 | 13 | - | 12 | 1 | - |
| 2015 | 117 | 38 | 33 | 1 | 25 | - | - |
| 2020 | 129 | 62 | 5 | 1 | 21 | 2 | 1 |
| 2025 | 124 | 74 | 33 | - | 15 | 2 | - |
| year | Average Cover (%) | | | | | | |
| 1997 | 2.3 | 0.1 | 0.0 | - | 0.0 | - | - |
| 2000 | 1.1 | - | - | - | 0.1 | - | - |
| 2005 | 1.1 | 0.0 | 0.2 | - | 0.2 | 0.0 | - |
| 2015 | 2.6 | 0.3 | 0.3 | 0.0 | 0.4 | - | - |
| 2020 | 5.1 | 0.5 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| 2025 | 3.8 | 0.4 | 0.2 | - | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-10.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Sclerocactus (fishhook cactus) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 14.4 | 1.5 | 0.5 | 2.9 | 0 | - | - | - | - | - |
| 2015 | 14 | 1.7 | 0.1 | 1.1 | 0.1 | - | - | - | - | - |
| 2020 | 15.2 | 1.8 | 0.3 | 0.8 | - | - | - | - | 0.1 | - |
| 2025 | 19.3 | 1.8 | 0.2 | 0.3 | - | - | - | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1997 | 13.0 | 1.2 | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 | - |
| 2000 | 14.6 | 1.4 | 0.5 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 |
| 2005 | 10.4 | 2.1 | 0.5 | 3.0 | 0.0 | 0.0 | - | - | 0.0 | - |
| 2015 | 10.5 | 1.7 | 0.1 | 1.1 | 0.0 | 0.0 | - | 0.0 | 0.0 | - |
| 2020 | 11.4 | 2.9 | 0.2 | 1.6 | - | - | - | 0.0 | 0.0 | - |
| 2025 | 14.1 | 2.7 | 0.4 | 0.5 | - | - | 0.0 | 0.0 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-10.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1997 | 5740 | 20 | 6 | 63 | 31 | 36 | 1 | 11 | 61/74 |
| 2000 | 4720 | - | 11 | 66 | 23 | 38 | 7 | 23 | 75/84 |
| 2005 | 5600 | 280 | 4 | 56 | 39 | 46 | 16 | 24 | 55/66 |
| 2015 | 4640 | 120 | 7 | 81 | 13 | 48 | 42 | 15 | 60/68 |
| 2020 | 4320 | 160 | 11 | 68 | 21 | 27 | 1 | 26 | 72/78 |
| 2025 | 5100 | 520 | 11 | 76 | 13 | 26 | 0 | 14 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1997 | 2140 | - | 4 | 96 | 0 | 0 | 0 | 0 | 12/22 |
| 2000 | 1900 | 20 | 1 | 99 | 0 | 0 | 0 | 0 | 14/20 |
| 2005 | 2180 | - | 0 | 100 | 0 | 19 | 10 | 0 | 12/28 |
| 2015 | 2100 | - | 3 | 96 | 1 | 58 | 14 | 0 | 11/25 |
| 2020 | 2780 | - | 12 | 88 | 0 | 39 | 9 | 1 | 10/25 |
| 2025 | 3900 | 20 | 5 | 92 | 3 | 22 | 8 | 3 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 33/60 |
| 2000 | 500 | - | 20 | 80 | 0 | 8 | 0 | 0 | 22/31 |
| 2005 | 420 | - | 24 | 76 | 0 | 5 | 0 | 0 | 24/34 |
| 2015 | 520 | 60 | 15 | 81 | 4 | 15 | 39 | 8 | 21/26 |
| 2020 | 520 | - | 4 | 96 | 0 | 0 | 0 | 0 | 19/31 |
| 2025 | 1520 | - | 58 | 38 | 4 | 14 | 9 | 4 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 15/17 |
| 2000 | 1240 | - | 44 | 55 | 2 | 0 | 0 | 0 | 12/14 |
| 2005 | 6920 | - | 21 | 79 | 0 | 0 | 0 | 0 | 16/24 |
| 2015 | 4200 | 1080 | 25 | 75 | 0 | 20 | 0 | 0 | 15/18 |
| 2020 | 4820 | - | 4 | 93 | 3 | 2 | 0 | 2 | 11/15 |
| 2025 | 3320 | - | 25 | 75 | 1 | 0 | 0 | 2 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/29 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 19/31 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 23/23 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | 6/14 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | 3/14 |
| 2005 | 240 | - | 17 | 83 | 0 | 0 | 0 | 0 | 5/15 |
| 2015 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 3/13 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/14 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | 4/9 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

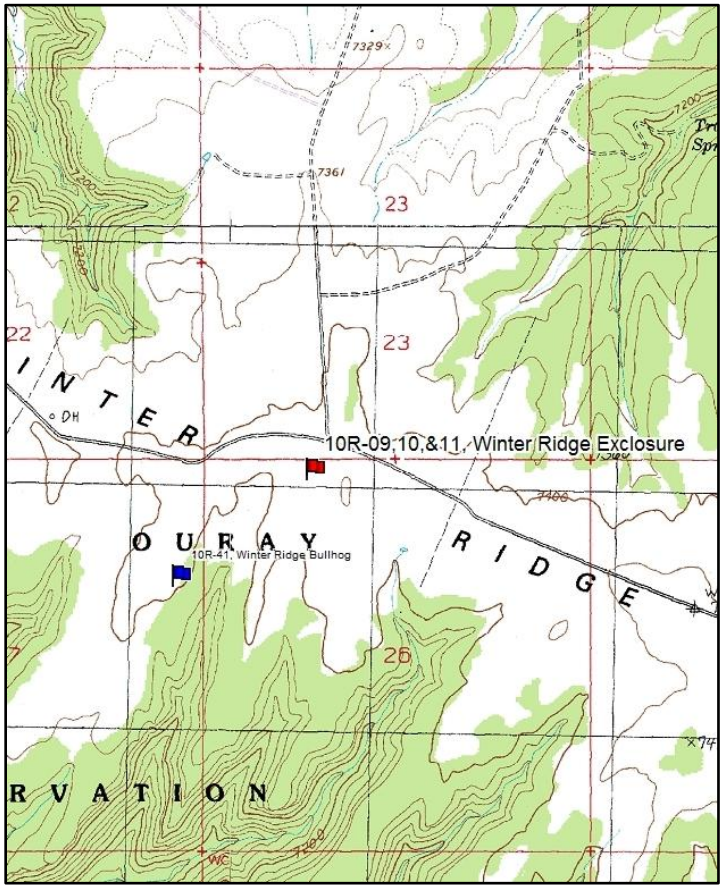
**Table 10R-10.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

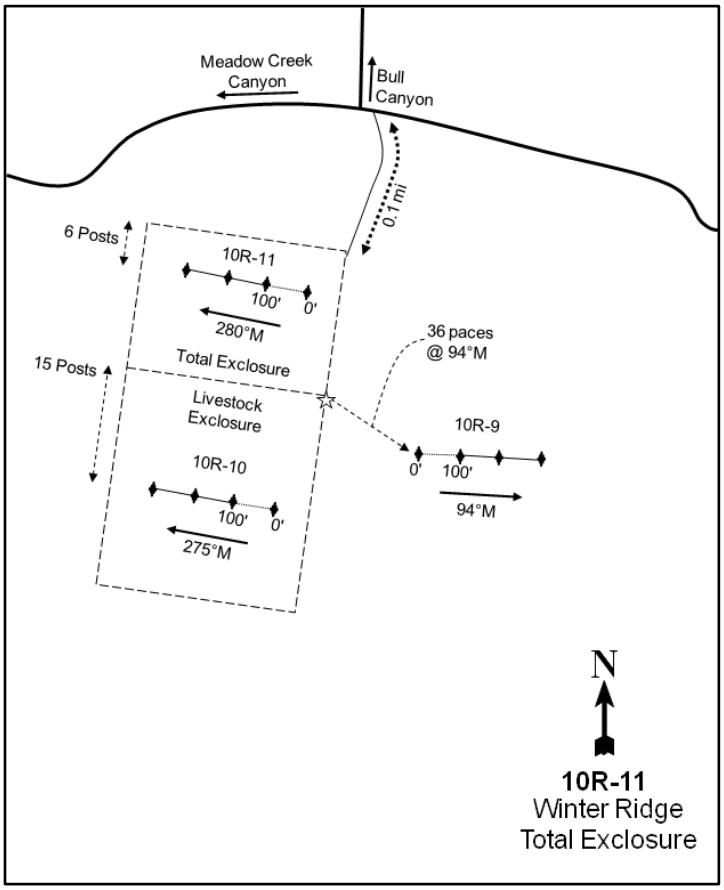
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 3 | - | 100 | - | - | - | 4.0 |
| 2025 | 1 | - | 100 | - | - | - | 2.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 24 | - | 70 | 30 | - | - | 4.6 |
| 2025 | 13 | 43 | 57 | - | - | - | 1.9 |

**Table 10R-10.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 17.8 | 6.4 | 2.8 | 29.5 | 0.0 | 9.1 | 0.0 | **65.6** | Fair |
| 2000 | 20.0 | 8.7 | 5.3 | 30.0 | 0.0 | 4.3 | 0.0 | **68.3** | Fair-Good |
| 2005 | 19.9 | 4.3 | 1.9 | 30.0 | 0.0 | 6.3 | 0.0 | **62.4** | Fair |
| 2015 | 19.8 | 11.6 | 3.0 | 30.0 | 0.0 | 10.0 | 0.0 | **74.4** | Good |
| 2020 | 21.3 | 9.3 | 5.6 | 30.0 | 0.0 | 10.0 | 0.0 | **76.2** | Good |
| 2025 | 26.4 | 11.3 | 5.1 | 17.0 | 0.0 | 10.0 | 0.0 | **69.8** | Fair-Good |

# WINTER RIDGE TOTAL EXCLOSURE - STUDY NO. 10R-11




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tenmile Canyon North; Township 15S, Range 21E, Section 26 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 625671 East 4372234 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 86 |
| Transect Bearing | 275° magnetic |
| Length | 300ft |
| Belt Placement | Line 1 (11ft & 71ft), Line 2 (34ft & 95ft), Line 3 (59ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of the Seep Ridge and Book Cliff Divide roads, proceed west along the divide for 9.4 miles to the Three Pines-Hay Canyon major intersection. Drive west along Winter Ridge Road for 9.8 miles to a fork. From the intersection where Meadow Creek Canyon and Bull Canyon meet, take the road to the south. Go 0.1 miles to the Winter Ridge Exclosure. From the northwest corner of the total exclosure, walk down six fenceposts; the 300-foot stake is just east of the sixth post. The 0-foot stake is on the east end and is marked by browse tag #86.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | HORSE POINT |
| Elevation | 7,200ft (2,195m) |
| Aspect | West |
| Slope | 4% |
| Sample Dates | 06/05/1997, 06/20/2000, 06/14/2005, 06/10/2015, 06/09/2020, 06/03/2025 |

**Table 10R-11.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Lop and Scatter - Hand Crew | Willow Watershed Improvement FY2023 | 5934 | September 2022 - June 2024 | 3791 |
| Lop and Scatter - Hand Crew | Wolf Point Lop and Scatter | 259 | April 2006 | 811 |

## Wildlife Habitat and Vegetation History

**Table 10R-11.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | crucial | year-long |
| Mule Deer | substantial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | substantial | summer |

**Table 10R-11.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2000 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2015 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush*) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1997-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1997, this site has remained in a stable state as a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*)-dominated plant community with a diverse herbaceous understory (Table 10R-11.12, Table 10R-11.13). From 1997 to 2005, prairie junegrass (*Koeleria macrantha*) and muttongrass (*Poa fendleriana*) were the dominant herbaceous species. In 2015, however, the composition of the grass community transitioned with western wheatgrass (*Pascopyrum smithii*) and needle and thread (*Hesperostipa comata*) as the most abundant species (Table 10R-11.10). Perennial forbs have provided low to moderate cover over the sample period (Table 10R-11.11).

This site's condition as mule deer winter range has ranged between fair and good since 1997; winter range condition was considered to be fair in 2025. Factors that negatively influence condition as deer winter range include reduced preferred browse cover and recruitment, and reduced perennial forb cover (Table 10R-11.6, Table 10R-11.7, Table 10R-11.13, Table 10R-11.15). According to pellet transect data elk presence was moderate in 2025. Despite some downed fencing, the exclosure is likely having some effect on reducing the presence of wildlife with few sagebrush plants having shown signs of moderate utilization. On-site observations state that there was little utilization of the herbaceous community during the most recent sample year (2025). However, the perennial forb and preferred browse communities appeared to be adversely affected by drought (Photos, Table 10R-11.9, Table 10R-11.10, Table 10R-11.11, Table 10R-11.12, Table 10R-11.13).

## Trend Summary Tables

**Table 10R-11.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 19.4 | 0.6 | - | - | - | - |
| 2000 | 20.0 | 1.1 | 0.0 | - | - | - |
| 2005 | 22.0 | 2.8 | 0.0 | 20.6 | 3.3 | - |
| 2015 | 14.0 | 1.3 | 0.1 | 23.7 | 1.0 | - |
| 2020 | 17.3 | 1.7 | 0.3 | 19.1 | 1.2 | 0.5 |
| 2025 | 14.1 | 0.7 | 0.0 | 14.8 | 1.4 | - |

**Table 10R-11.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | - | 421 | 19 | 213 | - | 18.6 | 0.1 | 3.7 |
| 2000 | - | 445 | 18 | 166 | - | 36.0 | 0.2 | 4.1 |
| 2005 | - | 430 | 5 | 166 | - | 33.8 | 0.0 | 3.5 |
| 2015 | - | 423 | 43 | 234 | - | 30.7 | 0.4 | 5.9 |
| 2020 | - | 417 | 24 | 246 | - | 26.4 | 0.1 | 7.5 |
| 2025 | - | 420 | 18 | 213 | - | 30.5 | 0.1 | 3.9 |

**Table 10R-11.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 21.5 | 13.0 | 33.4 | 0.2 | 0.1 | 40.4 |
| 2000 | 15.0 | 20.8 | 41.9 | 0.1 | 0.1 | 58.1 |
| 2005 | 24.8 | 3.9 | 32.1 | 0.0 | 0.1 | 54.2 |
| 2015 | 16.3 | 8.4 | 49.3 | 0.3 | 0.1 | 50.6 |
| 2020 | 25.3 | 4.7 | 44.8 | 0.0 | 0.7 | 49.6 |
| 2025 | 25.4 | 4.1 | 39.9 | 0.1 | 1.3 | 47.3 |

**Table 10R-11.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|
| | Quadrat Frequency | | |
| 1997 | - | - | 5 |
| 2000 | - | 2 | 3 |
| 2005 | - | - | 15 |
| 2020 | - | - | 3 |
| 2025 | 16 | - | 1 |
| Year | Days Use Per Acre (ha) | | |
| 1997 | - | - | - |
| 2000 | - | - | - |
| 2005 | - | - | - |
| 2020 | - | - | - |
| 2025 | 20.8 (51.3) | - | - |

**Table 10R-11.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Bouteloua gracilis (blue grama) | Carex (sedge) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1997 | 30 | - | 21 | 195 | 259 | 290 | 47 |
| 2000 | 42 | - | 17 | 114 | 287 | 352 | 99 |
| 2005 | 35 | - | 108 | 211 | 227 | 266 | 7 |
| 2015 | 36 | 5 | 220 | 182 | 297 | 48 | 74 |
| 2020 | 26 | - | 181 | 126 | 268 | 77 | 34 |
| 2025 | 36 | - | 185 | 116 | 307 | 79 | 29 |
| year | Average Cover (%) | | | | | | |
| 1997 | 1.0 | - | 0.2 | 4.2 | 1.8 | 10.9 | 0.5 |
| 2000 | 2.2 | - | 0.1 | 3.6 | 4.1 | 24.8 | 1.2 |
| 2005 | 1.0 | - | 4.5 | 10.1 | 3.1 | 14.9 | 0.2 |
| 2015 | 1.6 | 0.0 | 12.4 | 5.5 | 8.7 | 1.2 | 1.3 |
| 2020 | 1.0 | - | 11.0 | 4.4 | 6.9 | 2.6 | 0.6 |
| 2025 | 1.8 | - | 11.8 | 3.7 | 10.0 | 2.9 | 0.3 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-11.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Antennaria dimorpha (low pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum brevicaule (shortstem buckwheat) | Lygodesmia grandiflora (largeflower skeletonplant) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | 18 | 19 | 27 | - | 32 | 7 | 4 | 5 | - | - | 8 | - | - | 8 | 125 | 54 | - |
| 2000 | 6 | 14 | 19 | - | 6 | - | - | 15 | - | - | 3 | - | - | 3 | 119 | 14 | 3 |
| 2005 | 2 | 5 | 38 | 4 | 17 | 4 | 3 | - | 1 | - | - | 4 | 1 | 8 | 65 | 19 | 3 |
| 2015 | 15 | 29 | 40 | - | 52 | 4 | 7 | - | 23 | 1 | - | 4 | 4 | 13 | 104 | 52 | 25 |
| 2020 | 18 | 22 | 44 | - | 65 | 3 | 7 | 1 | 29 | - | 8 | 3 | - | 13 | 85 | 93 | 8 |
| 2025 | 18 | 18 | 23 | - | 7 | - | 29 | 2 | 15 | - | - | - | - | 10 | 77 | 92 | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | 0.1 | 0.1 | 0.2 | - | 0.6 | 0.2 | 0.0 | 0.0 | - | - | 0.0 | - | - | 0.3 | 1.7 | 0.1 | - |
| 2000 | 0.1 | 0.1 | 0.1 | - | 0.0 | - | - | 0.0 | - | - | 0.0 | - | - | 0.0 | 3.5 | 0.0 | 0.0 |
| 2005 | 0.0 | 0.0 | 0.5 | 0.0 | 0.6 | 0.2 | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.1 | 0.8 | 0.1 | 0.0 |
| 2015 | 0.6 | 0.2 | 0.3 | - | 0.7 | 0.2 | 0.1 | - | 0.2 | 0.0 | - | 0.0 | 0.0 | 0.7 | 1.9 | 0.3 | 0.2 |
| 2020 | 0.3 | 0.1 | 0.7 | - | 1.2 | 0.0 | 0.0 | 0.0 | 0.2 | - | 0.2 | 0.0 | - | 0.5 | 1.9 | 1.2 | 0.0 |
| 2025 | 0.3 | 0.1 | 0.1 | - | 0.0 | - | 0.1 | 0.0 | 0.1 | - | - | - | - | 0.4 | 1.4 | 0.8 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) | unknown annual forb[a] (unknown forb) |
|---|---|---|---|
| year | Nested Frequency | | |
| 1997 | 52 | - | - |
| 2000 | 58 | - | 4 |
| 2005 | 64 | - | - |
| 2015 | 86 | 16 | - |
| 2020 | 89 | 3 | - |
| 2025 | 96 | - | - |
| year | Average Cover (%) | | |
| 1997 | 0.4 | - | - |
| 2000 | 0.3 | - | 0.1 |
| 2005 | 1.2 | - | - |
| 2015 | 0.7 | 0.2 | - |
| 2020 | 1.2 | 0.0 | - |
| 2025 | 0.6 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-11.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | - | 20.5 | 0.1 | 0.5 | 2.8 | - | 0 | - | 0 |
| 2015 | - | 23.3 | - | 0.5 | 0.5 | - | 0.4 | - | - |
| 2020 | - | 19.1 | - | 1 | 0.2 | - | - | - | 0.5 |
| 2025 | - | 14.7 | 0 | 1.3 | 0.1 | - | 0.1 | - | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 1997 | - | 19.2 | 0.0 | 0.5 | 0.1 | - | 0.2 | 0.1 | - |
| 2000 | - | 20.0 | 0.0 | 0.3 | 0.6 | 0.0 | 0.0 | 0.2 | 0.0 |
| 2005 | - | 21.8 | 0.0 | 0.8 | 1.8 | - | 0.1 | 0.2 | 0.0 |
| 2015 | - | 14.0 | - | 0.9 | 0.4 | - | 0.0 | 0.0 | 0.1 |
| 2020 | 2.1 | 15.2 | 0.0 | 1.1 | 0.6 | - | 0.0 | 0.0 | 0.3 |
| 2025 | - | 13.6 | 0.1 | 0.5 | 0.2 | - | 0.4 | - | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-11.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 48/55 |
| 2020 | - | - | - | - | - | - | - | - | 78/76 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1997 | 5740 | 40 | 6 | 70 | 24 | 1 | 0 | 11 | 70/88 |
| 2000 | 7460 | 60 | 6 | 42 | 52 | 1 | 0 | 11 | 75/78 |
| 2005 | 5360 | - | 2 | 60 | 37 | 1 | 0 | 19 | 71/81 |
| 2015 | 4580 | 80 | 10 | 42 | 49 | 17 | 1 | 42 | 68/78 |
| 2020 | 3820 | 20 | 6 | 38 | 56 | 13 | 0 | 59 | 77/90 |
| 2025 | 3580 | 840 | 6 | 57 | 37 | 7 | 3 | 37 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1997 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/23 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/26 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/30 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/30 |
| 2025 | 140 | - | 14 | 86 | 0 | 57 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | 280 | - | 7 | 86 | 7 | 0 | 0 | 0 | 35/40 |
| 2000 | 220 | 20 | 27 | 18 | 55 | 0 | 0 | 9 | 40/51 |
| 2005 | 300 | - | 7 | 93 | 0 | 0 | 0 | 0 | 35/48 |
| 2015 | 320 | - | 0 | 25 | 75 | 0 | 0 | 75 | 31/32 |
| 2020 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/36 |
| 2025 | 380 | - | 0 | 79 | 21 | 0 | 0 | 79 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/12 |
| 2000 | 4400 | 40 | 22 | 78 | 0 | 0 | 0 | 0 | 10/11 |
| 2005 | 3800 | 60 | 0 | 100 | 0 | 0 | 0 | 0 | 18/26 |
| 2015 | 1020 | 60 | 16 | 84 | 0 | 0 | 0 | 2 | 15/20 |
| 2020 | 1420 | 100 | 20 | 78 | 3 | 0 | 0 | 0 | 11/17 |
| 2025 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[I] -- (Utah juniper) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1997 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 38/34 |
| 2000 | 200 | - | 0 | 90 | 10 | 0 | 0 | 0 | 50/32 |
| 2005 | 1100 | - | 0 | 95 | 6 | 6 | 0 | 2 | 24/23 |
| 2015 | - | - | - | - | - | - | - | - | 27/20 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/17 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 5/13 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1997 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/10 |
| 2000 | 220 | - | 18 | 82 | 0 | 0 | 0 | 0 | 4/7 |
| 2005 | 340 | - | 18 | 77 | 6 | 0 | 0 | 6 | 4/7 |
| 2015 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/8 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

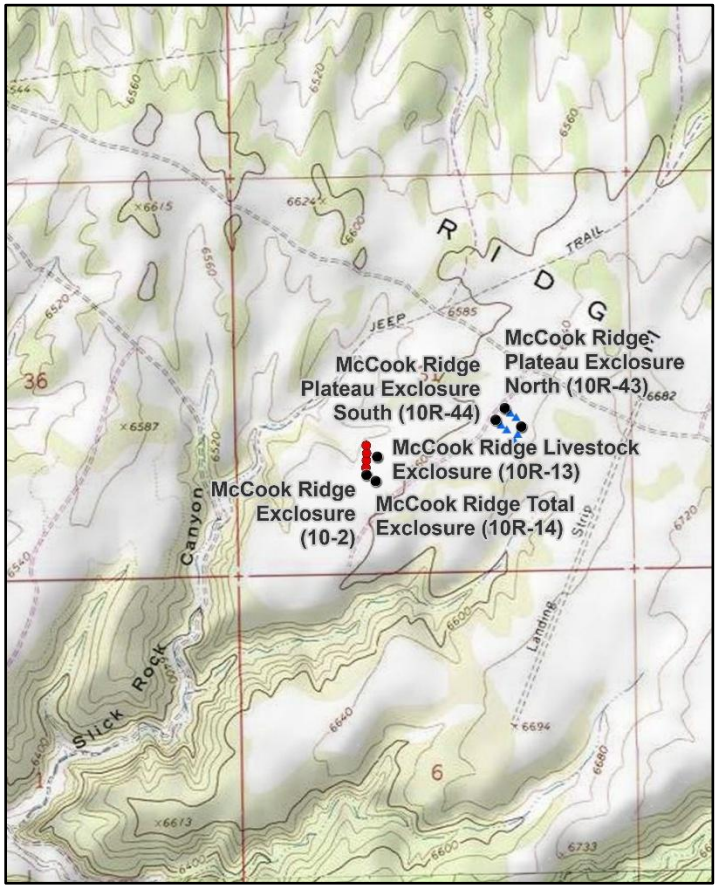
**Table 10R-11.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

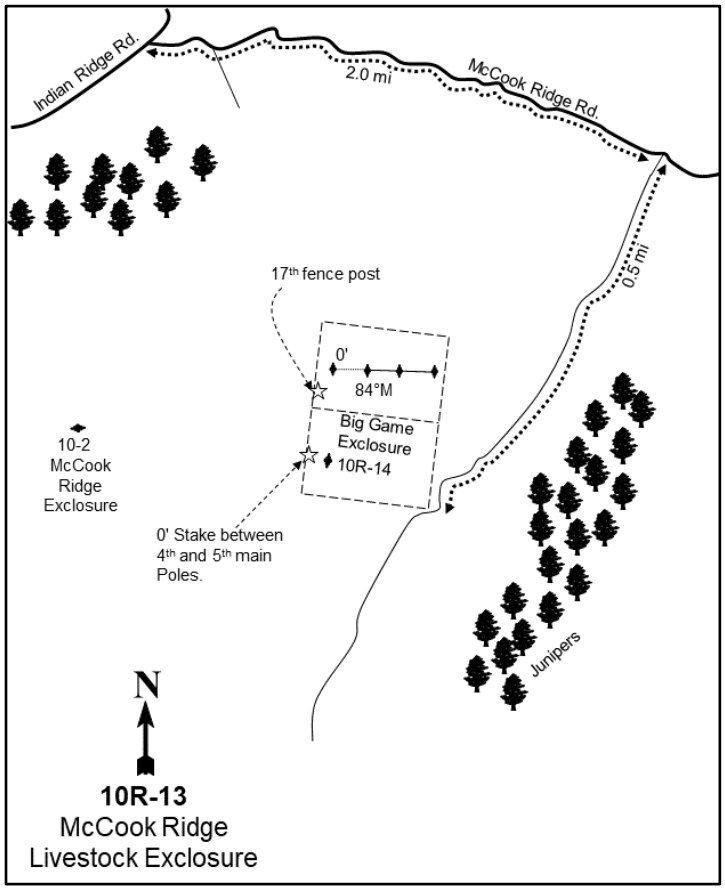
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2025 | 2 | - | 100 | - | - | - | 6.0 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 1 | - | - | 100 | - | - | 5.0 |
| 2025 | 1 | - | 100 | - | - | - | 5.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 43 | 20 | 60 | 20 | - | - | 4.6 |
| 2025 | 12 | - | 100 | - | - | - | 2.4 |

**Table 10R-11.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 24.3 | 7.8 | 2.9 | 30.0 | 0.0 | 7.5 | 0.0 | **72.5** | Good |
| 2000 | 25.0 | -0.4 | 3.1 | 30.0 | 0.0 | 8.2 | 0.0 | **65.9** | Fair |
| 2005 | 25.8 | 3.9 | 1.1 | 30.0 | 0.0 | 7.0 | 0.0 | **67.8** | Fair |
| 2015 | 29.6 | 0.4 | 4.9 | 30.0 | 0.0 | 10.0 | 0.0 | **74.9** | Good |
| 2020 | 23.9 | -1.8 | 2.9 | 30.0 | 0.0 | 10.0 | 0.0 | **65.0** | Fair |
| 2025 | 18.5 | 4.0 | 2.8 | 30.0 | 0.0 | 7.9 | 0.0 | **63.2** | Fair |

# MCCOOK RIDGE LIVESTOCK EXCLOSURE - STUDY NO. 10R-13




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cooper Canyon SE; Township 13S, Range 24E, Section 31 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 647981 East 4389250 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 84° magnetic |
| Length | 300ft |
| Belt Placement | Line 1 (11ft & 71ft), Line 2 (34ft & 95ft), Line 3 (59ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Ouray, go 38 miles south to the McCook Ridge-Indian Ridge turnoff. Turn left (east) and travel on Indian Ridge Road 9.1 miles toward Sweetwater Canyon and McCook Ridge to the intersection of Copper Canyon, Indian Ridge, and McCook Ridge. From Indian Ridge Road, turn southeast and proceed up McCook Ridge approximately 2 miles to a road on the right (a large exclosure can be seen off of the south side of the road). Turn right and drive approximately 0.5 miles to the exclosure. From the northwest side of the deer fence on the lower McCook Ridge Exclosure, the 0-foot baseline stake is near the middle of the west fence of the cattle exclosure at a bearing of 84 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | LOWER MCCOOK |
| Elevation | 6,600ft (2,012m) |
| Aspect | Northeast |
| Slope | 1-4% |
| Sample Dates | 06/12/1997, 06/08/2000, 06/07/2005, 06/08/2010, 06/03/2020, 06/24/2025 |

**Table 10R-13.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fencing - Exclosure | - | - | 1960s | - |
| Fencing - Exclosure | Fencing - Book Cliffs Three-Way Exclosure Reconstruction | 1734 | August 2010-June 2011 | - |

## Wildlife Habitat and Vegetation History

**Table 10R-13.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10R-13.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Wyoming Big Sagebrush | NA |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush/Annual Grass | Early Phase I |
| 2010 | Wyoming Big Sagebrush/Annual Grass | No Encroachment |
| 2020 | Wyoming Big Sagebrush/Annual Grass | No Encroachment |
| 2025 | Wyoming Big Sagebrush | No Encroachment |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Upland Loam (Wyoming Big Sagebrush*) |
| NRCS Ecological Site # | R034BY306UT |
| States and Transitions | 1997-2000 - Current Potential State: Community Phase Undefined<br>2005-2020 - Juniper Invasion State: Community Phase 3.1<br>2025 - Current Potential State: Community Phase Undefined |

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has been the dominant shrub species on this site throughout the study period. Cover and density of sagebrush have decreased overall, but they have increased since 2010. Other preferred browse species such as fourwing saltbush (*Atriplex canescens*), winterfat (*Krascheninnikovia lanata*), and prairie sagewort (*Artemisia frigida*) have also been present, but they have contributed comparatively little cover (Table 10R-13.12, Table 10R-13.13). The herbaceous understory has remained dominated by the introduced annual grass species cheatgrass (*Bromus tectorum*) in most sample years. Cheatgrass was a co-dominant vegetation component between 2005 and 2020, but cover and abundance decreased in 2025 (Table 10R-13.7, Table 10R-13.10). Utah juniper (*Juniperus osteosperma*) was recorded in density measurements in 2000 and 2005, but trees have not been observed in subsequent years (Table 10R-13.13). However, photos show that juniper is scattered across the adjacent area, indicating that future encroachment may be possible.

This site's condition as mule deer winter range has ranged between very poor and fair since 1995; winter range condition was considered fair in 2025. Factors that negatively influence condition as deer winter range include a lack of perennial grass and forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 10R-14.6, Table 10R-14.7, Table 10R-14.15). According to pellet transect data, deer presence has been variable over the course of the study and has fluctuated between low and high; deer presence was at its highest in 2005. The highest combined utilization percentages for Wyoming big sagebrush, winterfat, and fourwing saltbush utilization correspond with higher deer presence in 2005 (Table 10R-13.9, Table 10R-13.13).

## Trend Summary Tables

**Table 10R-13.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 22.6 | 0.3 | - | - | - | - |
| 2000 | 33.3 | 0.6 | - | - | - | - |
| 2005 | 18.8 | 0.1 | - | 16.0 | - | - |
| 2010 | 16.6 | 0.2 | - | 15.4 | 0.2 | - |
| 2020 | 15.9 | 0.0 | - | 16.8 | - | - |
| 2025 | 20.6 | 0.2 | - | 22.4 | 0.2 | - |

**Table 10R-13.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | 339 | 181 | 31 | 95 | 5.8 | 2.4 | 0.1 | 0.6 |
| 2000 | 241 | 205 | 26 | 104 | 4.8 | 7.7 | 0.1 | 0.8 |
| 2005 | 221 | 217 | 108 | 45 | 10.1 | 4.8 | 1.7 | 0.5 |
| 2010 | 347 | 84 | 214 | 52 | 17.9 | 1.2 | 2.1 | 1.0 |
| 2020 | 274 | 91 | 57 | 70 | 17.2 | 1.7 | 0.4 | 0.9 |
| 2025 | 129 | 119 | 46 | 44 | 6.0 | 3.6 | 0.4 | 0.1 |

**Table 10R-13.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 20.9 | 3.6 | 34.8 | 8.7 | 0.8 | 32.2 |
| 2000 | 27.7 | 1.8 | 51.0 | 3.4 | 0.2 | 45.5 |
| 2005 | 38.9 | 2.0 | 34.8 | 3.9 | 0.3 | 32.9 |
| 2010 | 24.6 | 0.4 | 50.9 | 2.7 | 0.1 | 39.9 |
| 2020 | 22.9 | 1.1 | 55.9 | 13.4 | 0.4 | 33.6 |
| 2025 | 37.0 | 0.5 | 40.4 | 9.3 | 0.4 | 27.4 |

**Table 10R-13.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1997 | - | 36 | 18 | 10 |
| 2000 | - | 41 | 16 | 12 |
| 2005 | - | 85 | 13 | 73 |
| 2010 | - | 38 | 3 | 15 |
| 2020 | - | 27 | 7 | 17 |
| 2025 | - | 50 | 21 | 4 |
| Year | Days Use Per Acre (ha) | | | |
| 1997 | - | - | - | - |
| 2000 | - | 63.7 (157.3) | 12.1 (29.8) | - |
| 2005 | - | 166.2 (410.5) | 26.2 (64.6) | - |
| 2010 | - | 23.4 (57.9) | 14.7 (36.4) | - |
| 2020 | 1.5 (3.6) | 50.2 (124.1) | 20.1 (49.7) | - |
| 2025 | - | 50.9 (125.8) | 4.7 (11.6) | - |

**Table 10R-13.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1997 | 1 | 339 | 43 | 18 | 131 |
| 2000 | 1 | 241 | 107 | 28 | 116 |
| 2005 | 0 | 221 | 91 | 24 | 162 |
| 2010 | 3 | 347 | 10 | 3 | 69 |
| 2020 | 7 | 274 | 12 | 17 | 67 |
| 2025 | 8 | 129 | 29 | 24 | 77 |
| year | Average Cover (%) | | | | |
| 1997 | 0.1 | 5.8 | 0.4 | 0.5 | 1.3 |
| 2000 | 0.2 | 4.8 | 2.7 | 2.1 | 2.7 |
| 2005 | 0.0 | 10.1 | 1.4 | 0.2 | 3.2 |
| 2010 | 0.0 | 17.9 | 0.1 | 0.0 | 1.1 |
| 2020 | 0.2 | 17.2 | 0.2 | 0.2 | 1.1 |
| 2025 | 0.2 | 6.0 | 0.6 | 1.3 | 1.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-13.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arabis (rockcress) | Castilleja (Indian paintbrush) | Comandra umbellata (bastard toadflax) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron pumilus (shaggy fleabane) | Lappula occidentalis[a] (flatspine stickseed) | Phlox longifolia (longleaf phlox) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1997 | - | 2 | 0 | - | 23 | - | 25 | 8 | - | 19 | 57 | - |
| 2000 | - | - | 6 | - | 3 | - | 42 | 6 | 1 | - | 63 | 17 |
| 2005 | - | - | - | - | 46 | 13 | - | 72 | - | - | 45 | - |
| 2010 | - | - | - | - | 5 | - | 7 | 213 | - | 5 | 42 | - |
| 2020 | - | - | - | - | 8 | - | 10 | 49 | - | 8 | 53 | 3 |
| 2025 | 2 | 1 | - | 4 | - | - | 2 | 45 | - | 3 | 34 | 1 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1997 | - | 0.0 | 0.0 | - | 0.1 | - | 0.1 | 0.0 | - | 0.0 | 0.4 | - |
| 2000 | - | - | 0.0 | - | 0.0 | - | 0.2 | 0.0 | 0.0 | - | 0.5 | 0.1 |
| 2005 | - | - | - | - | 1.1 | 0.1 | - | 0.5 | - | - | 0.5 | - |
| 2010 | - | - | - | - | 0.0 | - | 0.0 | 2.1 | - | 0.1 | 0.9 | - |
| 2020 | - | - | - | - | 0.0 | - | 0.1 | 0.3 | - | 0.1 | 0.8 | 0.0 |
| 2025 | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | 0.3 | - | 0.0 | 0.1 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-13.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 1997 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2005 | 0.2 | 14 | 0.9 | 0 | 0.9 | - |
| 2010 | 3 | 7.7 | 3.8 | 0.2 | 0.9 | - |
| 2020 | 0.2 | 10.9 | 3.9 | 0 | 1.8 | - |
| 2025 | 1.7 | 12.3 | 6.2 | 0.2 | 2.2 | - |
| year | Quadrat Cover (%) | | | | | |
| 1997 | 2.6 | 13.3 | 3.8 | 0.2 | 3.0 | 0.1 |
| 2000 | 3.6 | 21.5 | 5.6 | 0.2 | 2.5 | 0.4 |
| 2005 | 0.2 | 15.7 | 1.3 | 0.0 | 1.6 | 0.0 |
| 2010 | 4.0 | 8.6 | 2.9 | 0.2 | 1.1 | - |
| 2020 | 0.3 | 10.7 | 2.9 | 0.0 | 2.0 | - |
| 2025 | 2.0 | 11.5 | 5.7 | 0.2 | 1.5 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-13.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1997 | 6260 | 100 | 13 | 87 | 1 | 0 | 0 | 0 | 34/25 |
| 2000 | 6500 | 10620 | 6 | 91 | 3 | 17 | 1 | 1 | 11/21 |
| 2005 | 1120 | 140 | 25 | 75 | 0 | 11 | 5 | 0 | 12/13 |
| 2010 | 6180 | 700 | 11 | 89 | 0 | 0 | 0 | 0 | 18/24 |
| 2020 | 500 | 20 | 24 | 68 | 8 | 4 | 0 | 28 | 14/20 |
| 2025 | 4380 | 120 | 13 | 87 | 0 | 1 | 0 | 0 | - / - |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1997 | 5780 | 400 | 32 | 59 | 10 | 36 | 25 | 4 | 60/74 |
| 2000 | 6900 | - | 14 | 55 | 31 | 44 | 30 | 3 | 51/64 |
| 2005 | 6600 | - | 4 | 56 | 40 | 28 | 66 | 25 | 53/67 |
| 2010 | 4860 | 400 | 43 | 50 | 7 | 27 | 23 | 6 | 57/75 |
| 2020 | 3900 | - | 14 | 71 | 15 | 47 | 13 | 24 | 56/73 |
| 2025 | 5600 | 2980 | 39 | 48 | 13 | 5 | 46 | 13 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1997 | 880 | - | 7 | 32 | 61 | 34 | 9 | 16 | 75/86 |
| 2000 | 1100 | - | 0 | 33 | 67 | 26 | 13 | 13 | 81/98 |
| 2005 | 900 | - | 4 | 13 | 82 | 33 | 38 | 47 | 61/58 |
| 2010 | 680 | - | 12 | 50 | 38 | 18 | 35 | 38 | 81/94 |
| 2020 | 1120 | - | 2 | 14 | 84 | 46 | 5 | 89 | 76/87 |
| 2025 | 1180 | - | 9 | 61 | 31 | 39 | 34 | 32 | - / - |

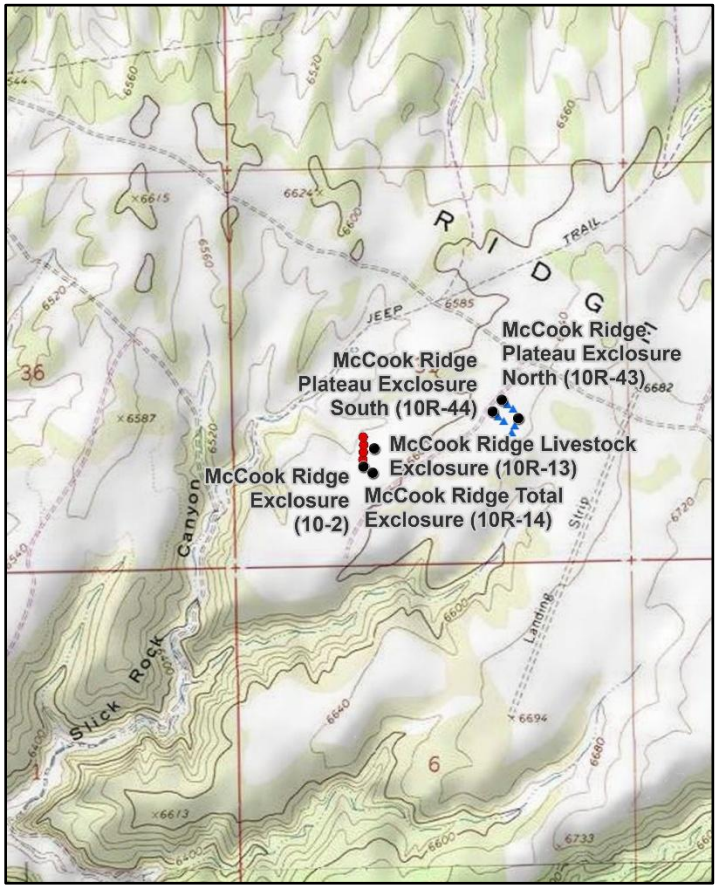
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 300 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/17 |
| 2000 | 840 | 80 | 7 | 93 | 0 | 0 | 0 | 0 | 13/17 |
| 2005 | 180 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 14/15 |
| 2010 | 720 | - | 17 | 83 | 0 | 0 | 0 | 0 | 16/17 |
| 2020 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/16 |
| 2025 | 120 | - | 0 | 83 | 17 | 0 | 0 | 17 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1997 | 4960 | 20 | 9 | 88 | 3 | 34 | 17 | 0 | 24/34 |
| 2000 | 5920 | 20 | 2 | 84 | 14 | 33 | 3 | 3 | 23/22 |
| 2005 | 6200 | - | 7 | 84 | 9 | 4 | 93 | 6 | 14/15 |
| 2010 | 3460 | 20 | 13 | 86 | 1 | 17 | 0 | 3 | 22/24 |
| 2020 | 1940 | - | 5 | 87 | 8 | 27 | 11 | 9 | 30/34 |
| 2025 | 1840 | - | 21 | 72 | 8 | 32 | 19 | 11 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/23 |
| 2000 | 180 | 20 | 11 | 89 | 0 | 0 | 0 | 0 | 8/25 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/21 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

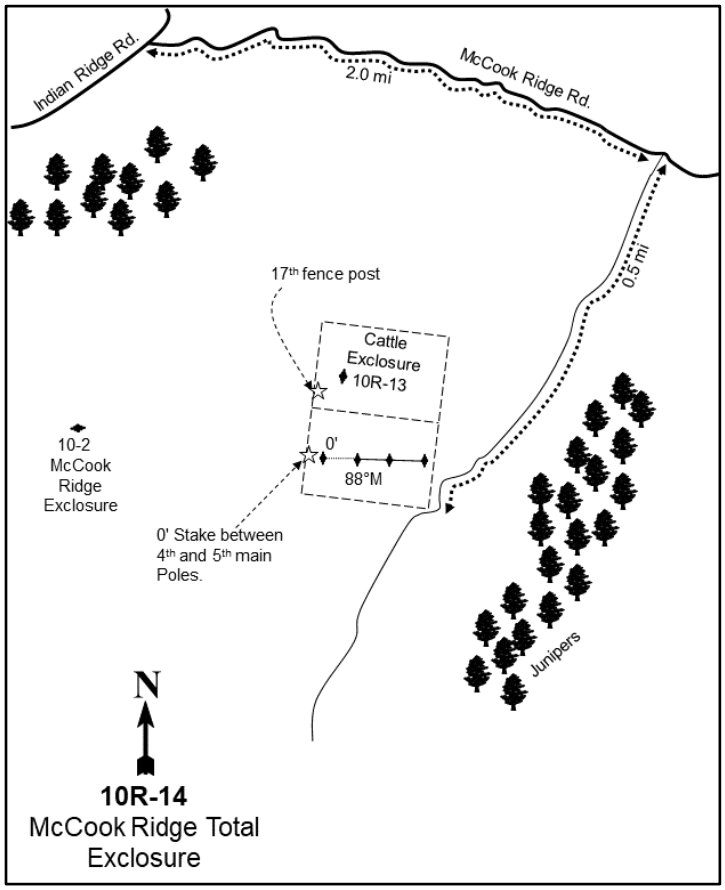
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-13.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 27.7 | 10.0 | 11.1 | 4.8 | -4.3 | 1.3 | 0.0 | **50.6** | Poor-Fair |
| 2000 | 30.0 | 5.1 | 5.1 | 15.5 | -3.6 | 1.5 | 0.0 | **53.6** | Fair |
| 2005 | 20.0 | 2.9 | 2.2 | 9.6 | -7.6 | 0.9 | 0.0 | **28.0** | Very Poor |
| 2010 | 18.5 | 11.2 | 13.7 | 2.5 | -13.4 | 2.0 | 0.0 | **34.5** | Very Poor-Poor |
| 2020 | 21.0 | 5.9 | 5.3 | 3.5 | -12.9 | 1.8 | 0.0 | **24.6** | Very Poor |
| 2025 | 27.6 | 10.0 | 13.4 | 7.3 | -4.5 | 0.2 | 0.0 | **54.0** | Fair |

# McCook Ridge Total Exclosure - Study No. 10R-14




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cooper Canyon SE; Township 13S, Range 24E, Section 31 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 647975 East 4389151 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 78 |
| Transect Bearing | 88° magnetic |
| Length | 300ft |
| Belt Placement | Line 1 (11ft & 71ft), Line 2 (34ft & 95ft), Line 3 (59ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Ouray, go 38 miles south to the McCook Ridge-Indian Ridge turnoff. Turn left (east) and travel on the Indian Ridge road 9.1 miles toward Sweetwater Canyon and McCook Ridge to the intersection of Cooper Canyon, Indian Ridge, and McCook Ridge. From Indian Ridge Road, turn southeast and proceed up McCook Ridge approximately 2 miles to a road on the right (a large exclosure can be seen off of the south side of the road). Turn right and drive approximately 0.5 miles to the exclosure. From the northwest side of the deer fence on the lower McCook Ridge Exclosure, the 0-foot baseline stake is near the middle of the west fence of the total exclosure at a bearing of 88 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | LOWER MCCOOK |
| Elevation | 6,600ft (2,012m) |
| Aspect | Northeast |
| Slope | 1-4% |
| Sample Dates | 06/12/1997, 06/08/2000, 06/07/2005, 06/08/2010, 06/02/2020, 06/25/2025 |

**Table 10R-14.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fencing - Exclosure | Fencing - Book Cliffs Three-Way Exclosure Reconstruction | 1734 | August 2010-June 2011 | - |
| Fencing - Exclosure | - | - | 1960s | - |

## Wildlife Habitat and Vegetation History

**Table 10R-14.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10R-14.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Annual Grass | NA |
| 2000 | Winterfat | Early Phase I |
| 2005 | Annual Grass/Winterfat | No Encroachment |
| 2010 | Annual Grass/Winterfat | No Encroachment |
| 2020 | Annual Grass/Winterfat | No Encroachment |
| 2025 | Perennial-Annual Grass/Fourwing Saltbush | No Encroachment |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Upland Loam (Wyoming Big Sagebrush*) |
| NRCS Ecological Site # | R034BY306UT |
| States and Transitions | 1997-2025 - Invasive Annuals State: Community Phase Undefined |

Since study establishment in 1997, the plant community on this site has been dominated by winterfat (*Krascheninnikovia lanata*) and fourwing saltbush (*Atriplex canescens*) with a mixture of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and prairie sagewort (*Artemisia frigida*) also present. Winterfat has the highest browse density as of 2025, but density has decreased overall since 2000. Furthermore, fourwing saltbush has also decreased in density since 1997 (Table 10R-14.6, Table 10R-14.12, Table 10R-14.13). Perennial grasses have generally been limited within the community and the herbaceous component has remained dominated by the introduced annual grass species cheatgrass (*Bromus tectorum*). Cheatgrass nested frequency and cover decreased substantially in 2000, but they have been high in all other sample years. However, cover of the native perennial grass species thickspike wheatgrass (*Elymus lanceolatus*) has increased and perennial grasses were co-dominant in 2025 (Table 10R-14.7, Table 10R-14.10). Perennial forbs have remained limited with the most abundant species being scarlet globemallow (*Sphaeralcea coccinea*) (Table 10R-14.11).

This site's condition as mule deer winter range has fluctuated between very poor and fair since 1995; winter range condition was considered fair in 2025. Factors that negatively influence condition as deer winter range include a lack of perennial grass and forb cover. Attention should be given to the presence of annual grass, which can decrease the resistance and resilience of the site to disturbance (Table 10R-14.10, Table 10R-14.11, Table 10R-14.15).

## Trend Summary Tables

**Table 10R-14.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 24.3 | - | - | - | - | - |
| 2000 | 34.0 | - | - | - | - | - |
| 2005 | 8.9 | - | - | 11.7 | - | - |
| 2010 | 16.9 | - | - | 22.1 | - | - |
| 2020 | 14.5 | 0.0 | - | 16.0 | 0.1 | - |
| 2025 | 17.3 | - | - | 22.4 | - | - |

**Table 10R-14.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | 473 | 15 | 25 | 25 | 28.6 | 0.5 | 0.3 | 0.3 |
| 2000 | 178 | 39 | 130 | 31 | 2.2 | 1.1 | 1.6 | 0.4 |
| 2005 | 369 | 45 | 171 | 20 | 23.6 | 0.5 | 3.6 | 0.1 |
| 2010 | 422 | 84 | 180 | 42 | 26.6 | 4.7 | 2.0 | 1.0 |
| 2020 | 359 | 162 | 57 | 68 | 20.0 | 14.5 | 0.6 | 1.8 |
| 2025 | 253 | 201 | 46 | 59 | 15.2 | 19.1 | 0.7 | 0.2 |

**Table 10R-14.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 7.0 | 3.5 | 60.9 | 1.8 | 0.1 | 51.2 |
| 2000 | 10.8 | 0.2 | 75.8 | 0.7 | 0.0 | 38.6 |
| 2005 | 27.4 | 0.1 | 45.2 | 1.8 | 0.1 | 37.0 |
| 2010 | 5.2 | 0.1 | 75.9 | 0.7 | - | 47.7 |
| 2020 | 9.7 | 0.6 | 66.3 | 5.1 | 0.0 | 46.7 |
| 2025 | 18.5 | 0.3 | 56.6 | 4.4 | 0.2 | 47.8 |

**Table 10R-14.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|
| | Quadrat Frequency | | |
| 1997 | - | - | 2 |
| 2000 | - | - | 6 |
| 2005 | 16 | 1 | 82 |
| 2010 | - | - | 26 |
| 2020 | - | - | 50 |
| 2025 | - | - | 8 |
| Year | Days Use Per Acre (ha) | | |
| 1997 | - | - | - |
| 2000 | - | - | - |
| 2005 | - | - | - |
| 2010 | - | - | - |
| 2020 | - | - | - |
| 2025 | - | - | - |

**Table 10R-14.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1997 | - | 473 | 1 | 5 | 9 |
| 2000 | - | 178 | 6 | 23 | 11 |
| 2005 | - | 369 | 4 | 26 | 15 |
| 2010 | 4 | 422 | 4 | 71 | 5 |
| 2020 | 1 | 359 | 4 | 154 | 5 |
| 2025 | 1 | 253 | 7 | 187 | 6 |
| year | Average Cover (%) | | | | |
| 1997 | - | 28.6 | 0.0 | 0.1 | 0.4 |
| 2000 | - | 2.2 | 0.2 | 0.8 | 0.1 |
| 2005 | - | 23.6 | 0.1 | 0.3 | 0.1 |
| 2010 | 0.1 | 26.6 | 0.0 | 4.5 | 0.1 |
| 2020 | 0.0 | 20.0 | 0.2 | 14.2 | 0.1 |
| 2025 | 0.1 | 15.2 | 0.3 | 18.6 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-14.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Orobanche fasciculata (clustered broomrape) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1997 | - | 16 | - | - | 3 | - | - | - | - | 25 | 0 | 9 |
| 2000 | - | 25 | 2 | 61 | 5 | - | - | - | 1 | 31 | - | 45 |
| 2005 | - | 52 | - | - | 137 | - | - | 4 | 1 | 16 | - | - |
| 2010 | - | 5 | - | 7 | 178 | - | 2 | 1 | - | 39 | - | - |
| 2020 | 3 | 5 | - | - | 34 | - | - | 29 | 2 | 44 | - | 16 |
| 2025 | 12 | 2 | - | - | 40 | 1 | - | 7 | - | 53 | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1997 | - | 0.2 | - | - | 0.0 | - | - | - | - | 0.3 | 0.0 | 0.1 |
| 2000 | - | 0.1 | 0.0 | 0.9 | 0.0 | - | - | - | 0.0 | 0.4 | - | 0.6 |
| 2005 | - | 0.9 | - | - | 2.6 | - | - | 0.0 | 0.0 | 0.1 | - | - |
| 2010 | - | 0.0 | - | 0.0 | 1.9 | - | 0.0 | 0.0 | - | 1.0 | - | - |
| 2020 | 0.0 | 0.0 | - | - | 0.1 | - | - | 0.3 | 0.0 | 1.4 | - | 0.4 |
| 2025 | 0.1 | 0.2 | - | - | 0.5 | 0.0 | - | 0.0 | - | 0.2 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-14.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 1997 | - | - | - | - | - |
| 2000 | - | - | - | - | - |
| 2005 | 0.6 | 3.1 | 3.6 | 4.4 | - |
| 2010 | 4.1 | 4.6 | 9.8 | 3.6 | - |
| 2020 | 0.2 | 2.7 | 8.9 | 4.2 | 0.1 |
| 2025 | 1.8 | 3.3 | 14.5 | 2.8 | - |
| year | Quadrat Cover (%) | | | | |
| 1997 | 2.4 | 1.3 | 7.3 | 13.3 | - |
| 2000 | 5.3 | 2.6 | 12.4 | 13.7 | - |
| 2005 | 0.6 | 2.5 | 2.0 | 3.8 | - |
| 2010 | 3.8 | 3.1 | 7.0 | 2.9 | - |
| 2020 | 0.4 | 3.3 | 6.9 | 3.9 | 0.0 |
| 2025 | 1.6 | 4.4 | 7.3 | 3.9 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-14.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1997 | 2320 | - | 10 | 90 | 1 | 0 | 0 | 0 | 39/40 |
| 2000 | 4620 | 2060 | 13 | 80 | 7 | 0 | 0 | 0 | 17/36 |
| 2005 | 3140 | 60 | 22 | 78 | 1 | 26 | 0 | 1 | 12/16 |
| 2010 | 4120 | 140 | 25 | 75 | 0 | 0 | 0 | 0 | 25/34 |
| 2020 | 580 | 20 | 28 | 41 | 31 | 0 | 0 | 41 | 13/18 |
| 2025 | 1600 | 120 | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1997 | 640 | 2480 | 81 | 19 | 0 | 0 | 0 | 0 | 92/107 |
| 2000 | 1200 | 80 | 68 | 32 | 0 | 0 | 0 | 0 | 81/79 |
| 2005 | 700 | - | 6 | 86 | 9 | 14 | 0 | 0 | 93/102 |
| 2010 | 1260 | 40 | 64 | 29 | 8 | 0 | 0 | 8 | 101/131 |
| 2020 | 700 | - | 0 | 89 | 11 | 0 | 0 | 11 | 63/67 |
| 2025 | 860 | 80 | 28 | 49 | 23 | 0 | 0 | 30 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1997 | 1280 | - | 2 | 58 | 41 | 0 | 0 | 14 | 88/104 |
| 2000 | 1160 | - | 0 | 60 | 40 | 2 | 0 | 5 | 98/138 |
| 2005 | 920 | 20 | 2 | 7 | 91 | 2 | 2 | 72 | 99/111 |
| 2010 | 680 | - | 6 | 77 | 18 | 3 | 0 | 18 | 89/130 |
| 2020 | 740 | - | 11 | 19 | 70 | 5 | 0 | 73 | 101/148 |
| 2025 | 860 | 60 | 5 | 74 | 21 | 0 | 2 | 26 | - / - |

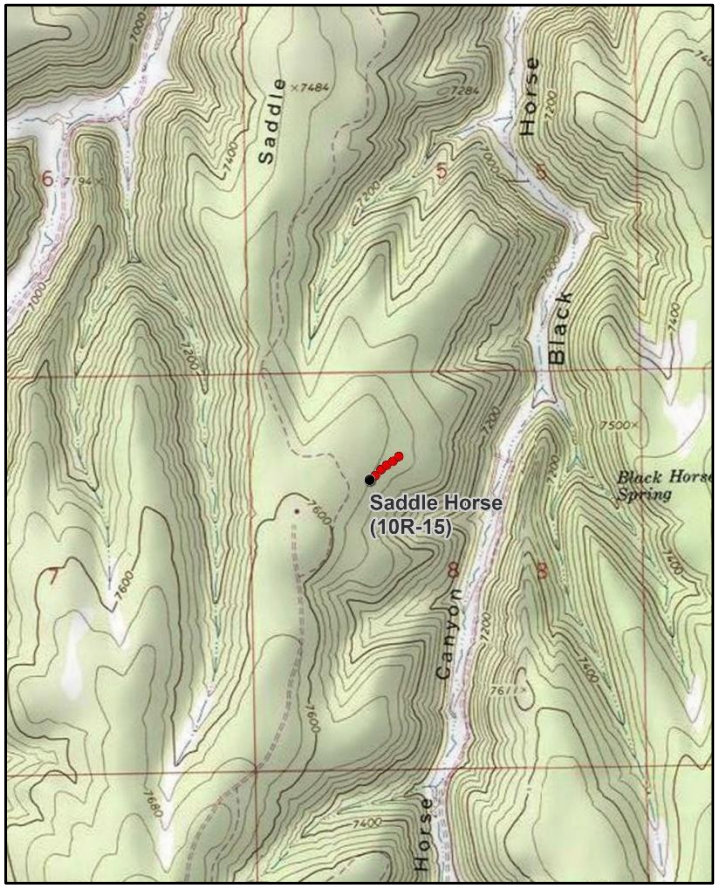
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1997 | 8020 | - | 12 | 80 | 8 | 0 | 0 | 3 | 59/45 |
| 2000 | 9060 | 20 | 3 | 61 | 37 | 0 | 0 | 2 | 43/48 |
| 2005 | 8860 | - | 6 | 90 | 4 | 24 | 19 | 4 | 25/27 |
| 2010 | 4560 | 20 | 12 | 86 | 1 | 1 | 1 | 3 | 29/30 |
| 2020 | 3620 | - | 6 | 88 | 6 | 34 | 4 | 8 | 32/37 |
| 2025 | 4260 | 140 | 9 | 87 | 4 | 7 | 3 | 15 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/5 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/16 |

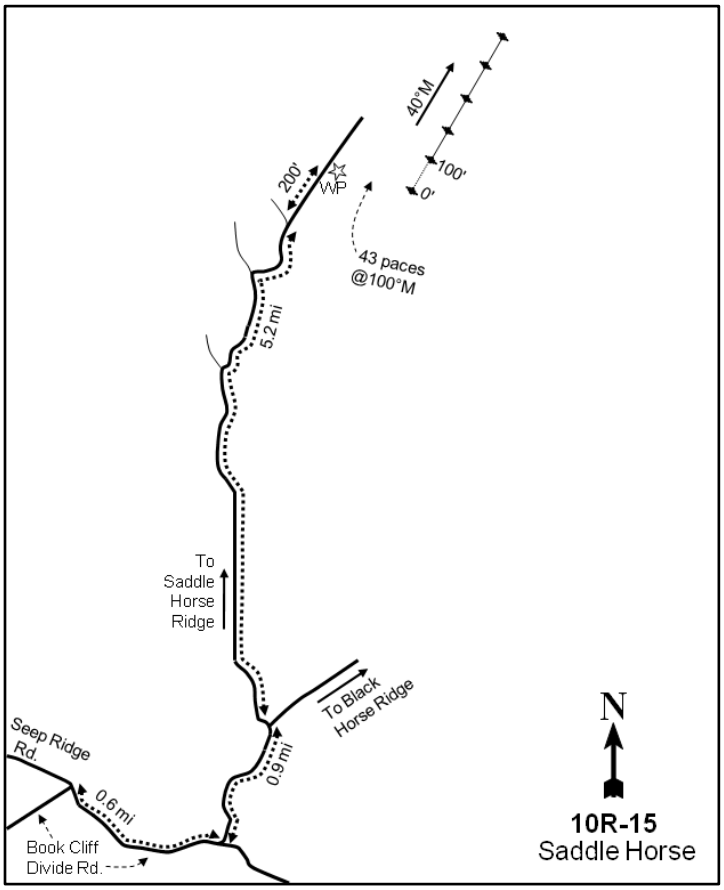
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-14.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 29.8 | 10.1 | 6.2 | 1.1 | -20.0 | 0.6 | 0.0 | **27.8** | Very Poor |
| 2000 | 30.0 | 5.8 | 4.2 | 2.3 | -1.6 | 0.7 | 0.0 | **41.4** | Poor |
| 2005 | 14.5 | 5.5 | 2.8 | 1.0 | -17.7 | 0.2 | 0.0 | **6.3** | Very Poor |
| 2010 | 26.6 | 12.1 | 11.2 | 9.4 | -20.0 | 1.9 | 0.0 | **41.2** | Poor |
| 2020 | 20.0 | 2.2 | 4.0 | 29.1 | -15.0 | 3.5 | 0.0 | **43.8** | Poor |
| 2025 | 27.6 | 9.8 | 4.9 | 30.0 | -11.4 | 0.4 | 0.0 | **61.3** | Fair |

# SADDLE HORSE - STUDY NO. 10R-15




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Seep Canyon SE; Township 15S, Range 24E, Section 08 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 649728 East 4377121 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 40° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From the intersection of Seep Ridge Road and Book Cliffs Divide Road, continue 0.6 miles to an intersection with the road to Black Horse Ridge. Turn left and go 0.9 miles to the intersection with the road to Saddle Horse Ridge. Turn left at the intersection and continue 5.2 miles to the third fork while staying right at the first two forks. From the third fork, the witness post is approximately 200 feet away from the right (east) side of the road. Walk 43 paces from the witness post to the 0-foot stake at 100 degrees magnetic.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SWEET WATER |
| Elevation | 7,539ft (2,298m) |
| Aspect | Southeast |
| Slope | 12% |
| Sample Dates | 06/25/1998, 06/06/2000, 06/09/2005, 06/16/2010, 07/13/2015, 06/10/2020, 06/11/2025 |

**Table 10R-15.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Chaining - Chain Unknown | - | - | 1960s | - |
| Seeding - Seed Unknown | - | - | 1960s | - |
| Fire - Prescribed | PR Prescribed Fire 2001 | LTDL 9067-24718 | September 2001 | 12500 |

## Wildlife Habitat and Vegetation History

**Table 10R-15.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | substantial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10R-15.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1998 | Mixed Mountain Brush/Pinyon-Juniper | Phase I |
| 2000 | Mixed Mountain Brush/Pinyon-Juniper | Phase I |
| 2005 | Mixed Mountain Brush/Pinyon-Juniper | Phase I |
| 2010 | Mixed Mountain Brush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 2015 | Mixed Mountain Brush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 2020 | Pinyon-Juniper/Mixed Mountain Brush | Phase II |
| 2025 | Pinyon-Juniper/Mixed Mountain Brush | Phase II |

## Site Notes

A small fire burned the last 100 feet of the baseline sometime between 2000 and 2005. In 2025, it was noted that a lop and scatter project had taken place just adjacent to the site, but the project did not affect the transect itself.

## Soils

**Table 10R-15.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.0 | 52.7 | 26.7 | 20.6 | 4.5 | 8.3 | 70.4 | 0.9 | 06/22/1998 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 1998, this site has existed as a mixed mountain brush community composed of species including antelope bitterbrush (*Purshia tridentata*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and alderleaf mountain mahogany (*Cercocarpus montanus*), among others (Table 10R-15.12). The introduced perennial grass species intermediate wheatgrass (*Thinopyrum intermedium*) has contributed a majority of the herbaceous cover throughout the duration of the study. Forbs have remained relatively rare (Table 10R-15.7, Table 10R-15.10, Table 10R-15.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees have increased in cover and density since 2005 and have been a co-dominant vegetation component throughout the study period; the site has been considered to be within Phase II of woodland succession since 2020 (Table 10R-15.4, Table 10R-15.12, Table 10R-15.14). Without a tree-removing disturbance, the site will likely continue to progress through the phases of woodland succession and exhibit the associated deterioration of the beneficial browse and herbaceous populations.

The grass community on this site could provide adequate forage for summering mule deer and elk, although diversity and abundance are limited as of 2025. Pellet transect data indicates that deer presence has remained low in most sample years, but it was moderate in 2005 and 2010. Elk presence was similar with most years considered to be low, except in 2005 when elk presence was high. During the 2024/25 winter season the area had occasional occurrences of collared elk (Wildlife Migration Initiative). Bison and/or cattle presence has generally remained low. On-site observations state that there was little to no utilization of the herbaceous understory during the most recent sample year (2025). Despite the understory not being adversely affected by utilization, the site was likely affected by drought (Photos, Table 10R-15.9, Table 10R-15.10, Table 10R-15.11).

## Trend Summary Tables

**Table 10R-15.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1998 | 13.0 | 0.4 | 5.8 | - | - | - |
| 2000 | 11.5 | - | 5.7 | - | - | - |
| 2005 | 9.6 | 0.1 | 6.5 | 9.9 | 0.1 | 8.3 |
| 2010 | 10.8 | 0.0 | 8.3 | 18.9 | - | 14.9 |
| 2015 | 12.4 | 0.4 | 10.5 | 20.1 | 0.7 | 13.9 |
| 2020 | 11.0 | 0.3 | 16.2 | 13.9 | 0.1 | 15.9 |
| 2025 | 11.6 | 1.1 | 11.3 | 14.1 | 0.8 | 23.4 |

**Table 10R-15.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1998 | 29 | 361 | 17 | - | 0.2 | 19.3 | 0.1 | 1.7 |
| 2000 | - | 333 | 3 | - | - | 13.7 | 0.0 | 0.8 |
| 2005 | 43 | 236 | 127 | - | 0.9 | 11.0 | 3.3 | 1.1 |
| 2010 | 72 | 267 | 75 | - | 0.9 | 12.8 | 0.3 | 1.4 |
| 2015 | 70 | 263 | 24 | - | 3.1 | 15.6 | 0.1 | 2.0 |
| 2020 | 35 | 234 | 53 | - | 0.1 | 12.7 | 0.4 | 2.8 |
| 2025 | 9 | 166 | 61 | - | 0.0 | 5.2 | 1.0 | 1.3 |

**Table 10R-15.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1998 | 16.1 | 0.2 | 57.2 | 2.0 | 3.1 | 40.8 |
| 2000 | 21.5 | 0.8 | 56.3 | 1.4 | 4.4 | 34.0 |
| 2005 | 33.3 | 1.4 | 41.4 | 1.8 | 3.4 | 30.1 |
| 2010 | 21.5 | 0.0 | 56.4 | 3.1 | 3.0 | 36.7 |
| 2015 | 20.9 | 1.1 | 52.6 | 7.7 | 4.3 | 39.4 |
| 2020 | 20.6 | 0.4 | 59.1 | 9.4 | 6.4 | 38.8 |
| 2025 | 29.4 | 1.1 | 52.5 | 3.9 | 5.9 | 29.7 |

**Table 10R-15.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1998 | 1 | 13 | 27 | 6 |
| 2000 | - | 15 | 29 | 52 |
| 2005 | - | 16 | 31 | 45 |
| 2010 | - | 12 | 19 | 4 |
| 2015 | - | 8 | 7 | 14 |
| 2020 | 1 | 12 | 5 | 5 |
| 2025 | - | 11 | 11 | 15 |
| Year | Days Use Per Acre (ha) | | | |
| 1998 | - | - | - | - |
| 2000 | - | 15.4 (38.1) | 36.2 (89.4) | - |
| 2005 | - | 36.8 (91.0) | 62.3 (153.9) | - |
| 2010 | 1.5 (3.6) | 38.9 (96.0) | 16.1 (39.7) | - |
| 2015 | - | 3.4 (8.3) | 6.7 (16.6) | - |
| 2020 | 6.5 (16.1) | 8.1 (19.9) | 14.1 (34.8) | - |
| 2025 | 0.7 (1.8) | 10.0 (24.8) | 8.7 (21.5) | - |

**Table 10R-15.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1998 | 14 | 16 | - | 29 | 63 | 18 | 29 | - | - | 332 |
| 2000 | 3 | - | - | - | 53 | - | 18 | - | - | 321 |
| 2005 | 5 | 4 | - | 43 | 23 | 16 | 10 | - | - | 213 |
| 2010 | 9 | - | 5 | 72 | 28 | 3 | 23 | - | - | 246 |
| 2015 | 3 | - | - | 70 | 37 | 20 | 18 | 5 | 3 | 233 |
| 2020 | 19 | - | 5 | 35 | 7 | 43 | 13 | 6 | - | 186 |
| 2025 | 17 | - | 5 | 9 | 21 | 11 | 3 | 4 | 1 | 133 |
| year | Average Cover (%) | | | | | | | | | |
| 1998 | 0.5 | 0.2 | - | 0.2 | 1.8 | 0.4 | 0.4 | - | - | 16.0 |
| 2000 | 0.0 | - | - | - | 1.1 | - | 0.3 | - | - | 12.3 |
| 2005 | 0.1 | 0.1 | - | 0.9 | 0.3 | 0.6 | 0.1 | - | - | 9.7 |
| 2010 | 0.1 | - | 0.0 | 0.9 | 0.1 | 0.0 | 0.1 | - | - | 12.3 |
| 2015 | 0.1 | - | - | 3.1 | 0.9 | 1.1 | 0.2 | 0.1 | 0.2 | 13.1 |
| 2020 | 0.3 | - | 0.0 | 0.1 | 0.1 | 0.9 | 0.2 | 0.2 | - | 10.9 |
| 2025 | 0.4 | - | 0.2 | 0.0 | 0.3 | 0.3 | 0.1 | 0.0 | 0.0 | 3.9 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-15.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Antennaria (pussytoes) | Arabis (rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (looseflower milkvetch) | Chenopodium fremontii[a] (Fremont's goosefoot) | Descurainia pinnata[a] (western tansymustard) | Erigeron (fleabane) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Heliomeris multiflora var. multiflora (showy goldeneye) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1998 | - | 6 | 11 | 3 | 4 | - | - | - | 0 | - | - | 3 | 15 | - | - | 2 | 3 |
| 2000 | - | 3 | 6 | - | - | - | - | - | - | - | - | 1 | 3 | - | - | 2 | 4 |
| 2005 | - | 3 | 14 | - | - | - | 11 | 62 | 2 | - | - | 3 | 93 | - | - | 3 | 7 |
| 2010 | - | 8 | 4 | - | 0 | - | 2 | 10 | 2 | - | - | - | 68 | 8 | - | 3 | 6 |
| 2015 | 11 | 16 | 32 | - | - | 2 | - | 7 | 2 | - | 2 | - | 10 | 2 | - | 2 | 15 |
| 2020 | 14 | 13 | 27 | - | - | - | - | - | - | 2 | 4 | - | 5 | 27 | - | 1 | 8 |
| 2025 | 61 | 6 | 15 | - | - | - | - | - | - | - | - | - | 13 | - | 11 | - | 7 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1998 | - | 0.2 | 0.0 | 0.1 | 0.0 | - | - | - | 0.0 | - | - | 0.0 | 0.1 | - | - | 0.0 | 0.0 |
| 2000 | - | 0.1 | 0.0 | - | - | - | - | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| 2005 | - | 0.1 | 0.0 | - | - | - | 0.1 | 1.0 | 0.0 | - | - | 0.0 | 2.2 | - | - | 0.0 | 0.0 |
| 2010 | - | 0.2 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | - | 0.2 | 0.0 | - | 0.0 | 0.2 |
| 2015 | 0.0 | 0.4 | 0.1 | - | - | 0.2 | - | 0.0 | 0.0 | - | 0.1 | - | 0.1 | 0.0 | - | 0.0 | 0.1 |
| 2020 | 0.0 | 0.9 | 0.3 | - | - | - | - | - | - | 0.0 | 0.2 | - | 0.0 | 0.4 | - | 0.0 | 0.1 |
| 2025 | 0.3 | 0.3 | 0.1 | - | - | - | - | - | - | - | - | - | 0.7 | - | 0.1 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon caespitosus (mat penstemon) | Penstemon pachyphyllus (thickleaf beardtongue) | Penstemon watsonii (Watson's penstemon) | Polygonum douglasii[a] (Douglas' knotweed) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1998 | 3 | - | 39 | - | 35 | - | 2 |
| 2000 | - | 11 | 8 | - | 28 | - | - |
| 2005 | - | 3 | 7 | 4 | 32 | - | - |
| 2010 | - | 17 | 10 | - | 55 | - | - |
| 2015 | - | 7 | 12 | - | 39 | - | - |
| 2020 | - | 14 | 11 | 7 | 26 | 3 | - |
| 2025 | - | 14 | 16 | - | 21 | - | - |
| year | Average Cover (%) | | | | | | |
| 1998 | 0.0 | - | 0.6 | - | 0.7 | - | 0.0 |
| 2000 | - | 0.1 | 0.5 | - | 0.1 | - | - |
| 2005 | - | 0.0 | 0.3 | 0.0 | 0.5 | - | - |
| 2010 | - | 0.1 | 0.0 | - | 0.7 | - | - |
| 2015 | - | 0.2 | 0.1 | - | 0.7 | - | - |
| 2020 | - | 0.1 | 0.3 | 0.0 | 1.0 | 0.0 | - |
| 2025 | - | 0.2 | 0.3 | - | 0.3 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-15.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Ericameria nauseosa (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Juniperus osteosperma[t] (Utah juniper) | Opuntia fragilis (brittle pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 5.1 | 1.9 | - | 0.1 | 4.1 | 0.1 | 4.2 | 2.7 | 0.1 |
| 2010 | - | 8 | 3.4 | - | - | 7.1 | - | 7.8 | 7.4 | 0.1 |
| 2015 | - | 7.4 | 4.3 | 0.7 | - | 5.1 | 0 | 8.8 | 8.2 | 0.2 |
| 2020 | - | 6.6 | 3.5 | - | - | 7.8 | 0.1 | 8.1 | 3.7 | 0.1 |
| 2025 | - | 6.4 | 3.3 | 0.6 | - | 7.2 | 0.2 | 16.2 | 4.2 | 0.2 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1998 | 0.0 | 4.3 | 2.3 | - | 0.3 | 4.4 | 0.4 | 1.4 | 6.0 | 0.2 |
| 2000 | - | 3.1 | 2.1 | - | 0.1 | 3.5 | - | 2.3 | 5.5 | 0.7 |
| 2005 | 0.0 | 3.3 | 1.7 | - | 0.2 | 4.0 | 0.1 | 2.5 | 4.3 | 0.0 |
| 2010 | - | 4.9 | 1.9 | - | 0.0 | 4.6 | 0.0 | 3.7 | 4.0 | 0.0 |
| 2015 | - | 4.3 | 2.3 | 0.2 | - | 3.9 | 0.2 | 6.7 | 5.8 | 0.0 |
| 2020 | - | 4.9 | 2.5 | 0.2 | 0.0 | 7.0 | 0.1 | 9.2 | 3.6 | 0.0 |
| 2025 | - | 6.3 | 1.7 | 0.8 | - | 4.4 | 0.3 | 6.8 | 3.7 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-15.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1998 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 21/34 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 11/29 |
| 2010 | - | - | - | - | - | - | - | - | 18/25 |
| 2015 | - | - | - | - | - | - | - | - | 16/32 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1998 | 1480 | 180 | 46 | 54 | 0 | 7 | 0 | 0 | 73/103 |
| 2000 | 1080 | 60 | 39 | 57 | 4 | 9 | 0 | 0 | 59/83 |
| 2005 | 1280 | 420 | 28 | 64 | 8 | 27 | 0 | 3 | 50/74 |
| 2010 | 1340 | 180 | 10 | 82 | 8 | 34 | 0 | 8 | 56/86 |
| 2015 | 1520 | 20 | 17 | 58 | 25 | 26 | 45 | 33 | 47/74 |
| 2020 | 1400 | 80 | 31 | 44 | 24 | 17 | 7 | 31 | 56/85 |
| 2025 | 2320 | 1640 | 28 | 46 | 27 | 10 | 0 | 26 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1998 | 260 | - | 0 | 100 | 0 | 39 | 62 | 0 | 132/123 |
| 2000 | 60 | - | 0 | 100 | 0 | 100 | 0 | 0 | 133/133 |
| 2005 | 180 | - | 11 | 56 | 33 | 22 | 56 | 0 | 113/107 |
| 2010 | 200 | - | 0 | 90 | 10 | 40 | 50 | 10 | 100/94 |
| 2015 | 280 | - | 14 | 79 | 7 | 29 | 29 | 7 | 114/128 |
| 2020 | 220 | - | 18 | 82 | 0 | 55 | 0 | 0 | 132/136 |
| 2025 | 180 | 100 | 0 | 67 | 33 | 0 | 11 | 33 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1998 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 50/45 |
| 2000 | 40 | - | 0 | 50 | 50 | 100 | 0 | 0 | 27/35 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/27 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 57/62 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 53/68 |
| 2020 | - | - | - | - | - | - | - | - | 39/44 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 120 | - | 50 | 50 | 0 | 0 | 0 | 17 | 54/70 |
| 2020 | 40 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 60/84 |
| 2025 | 180 | - | 78 | 22 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1998 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 43/48 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | 46/44 |
| 2005 | 60 | - | 0 | 67 | 33 | 0 | 0 | 0 | 43/60 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 60/80 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 64/77 |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1998 | 160 | - | 75 | 13 | 13 | 0 | 13 | 13 | - / - |
| 2000 | 180 | - | 67 | 22 | 11 | 0 | 0 | 0 | - / - |
| 2005 | 160 | - | 0 | 63 | 38 | 0 | 0 | 25 | - / - |
| 2010 | 280 | - | 36 | 64 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 160 | - | 13 | 88 | 0 | 0 | 0 | 25 | - / - |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1998 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/74 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/34 |
| 2005 | 420 | - | 14 | 38 | 48 | 0 | 0 | 48 | 8/19 |
| 2010 | 40 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 260 | - | 15 | 85 | 0 | 0 | 0 | 0 | 7/23 |
| 2020 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/18 |
| 2025 | 280 | - | 0 | 86 | 14 | 0 | 0 | 14 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1998 | 140 | - | 57 | 43 | 0 | 0 | 0 | 14 | - / - |
| 2000 | 160 | - | 75 | 25 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 180 | - | 22 | 78 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 200 | 20 | 10 | 90 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1998 | 980 | 40 | 27 | 74 | 0 | 37 | 18 | 4 | 63/168 |
| 2000 | 800 | - | 15 | 73 | 13 | 15 | 63 | 3 | 44/127 |
| 2005 | 980 | - | 22 | 47 | 31 | 31 | 45 | 14 | 37/81 |
| 2010 | 900 | 40 | 9 | 89 | 2 | 47 | 20 | 2 | 41/87 |
| 2015 | 880 | 20 | 0 | 96 | 5 | 25 | 57 | 0 | 46/123 |
| 2020 | 600 | 20 | 7 | 87 | 7 | 60 | 10 | 7 | 48/101 |
| 2025 | 800 | - | 10 | 75 | 15 | 5 | 13 | 18 | - / - |

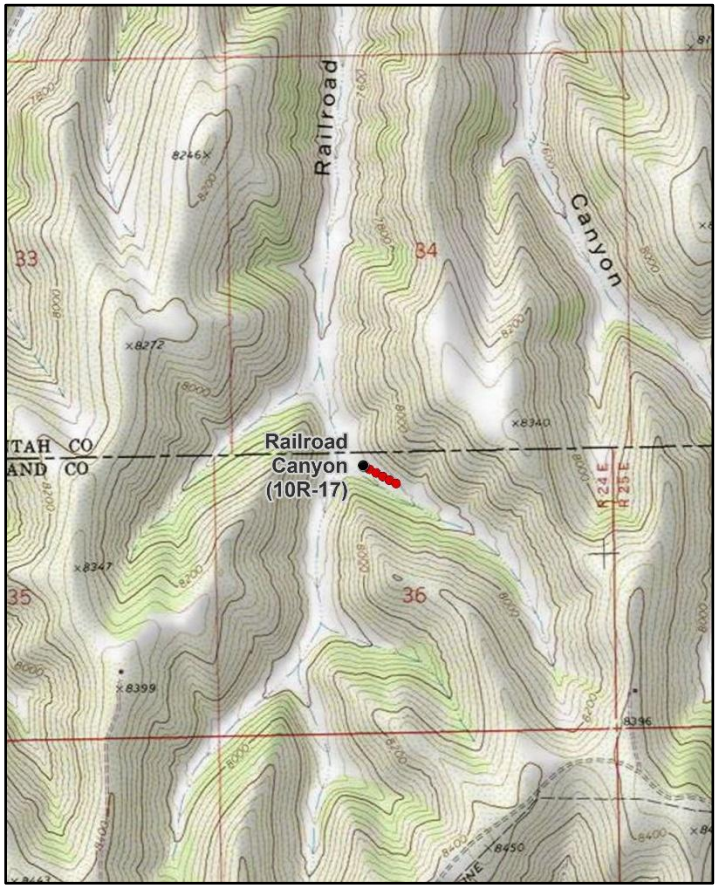
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Sambucus[p] -- (elderberry) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 54/29 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1998 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 112/172 |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 70/145 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 58/103 |
| 2010 | 20 | - | 100 | 0 | 0 | 100 | 0 | 0 | 42/96 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 57/105 |
| 2020 | 60 | - | 67 | 0 | 33 | 0 | 33 | 33 | 49/164 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

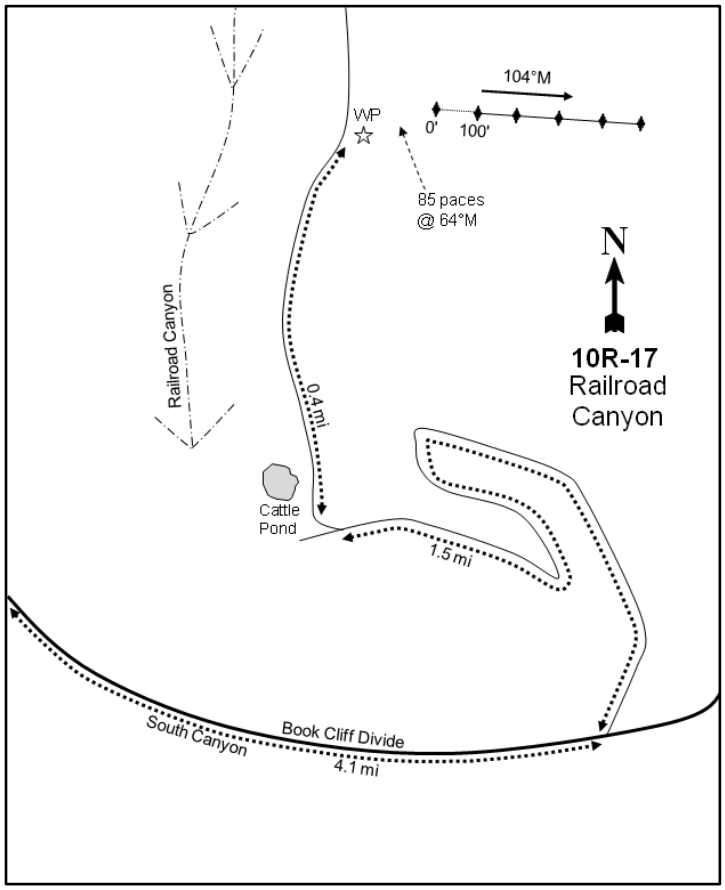
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-15.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 128 | - | - | - | - | - | 8.6 |
| 2005 | 40 | - | - | 58 | 17 | 25 | 13.8 |
| 2010 | 78 | - | 11 | 32 | 58 | - | 9.6 |
| 2015 | 82 | - | 5 | 32 | 47 | 16 | 12.5 |
| 2020 | 79 | - | 6 | 17 | 56 | 22 | 18.1 |
| 2025 | 78 | - | - | 29 | 53 | 18 | 26.8 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2000 | 9 | - | - | - | - | - | 8.7 |
| 2025 | 3 | - | - | - | - | 100 | 26.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 122 | - | - | - | - | - | 4.7 |
| 2005 | 34 | - | 50 | 50 | - | - | 5.9 |
| 2010 | 69 | - | 53 | 41 | 6 | - | 5.8 |
| 2015 | 76 | 6 | 6 | 67 | 22 | - | 7.0 |
| 2020 | 71 | - | 6 | 44 | 33 | 17 | 12.3 |
| 2025 | 72 | - | 11 | 33 | 50 | 6 | 11.6 |

# RAILROAD CANYON - STUDY NO. 10R-17




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | San Arroyo Ridge NW; Township 15S, Range 24E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 653107 East 4369525 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 103 |
| Transect Bearing | 104° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From the intersection of South Canyon Road and Book Cliffs Divide Road, follow Book Cliffs Divide Road east for 4.1 miles to an intersection. Turn left and follow the road into Railroad Canyon for 1.5 miles to a faint road before a cattle pond. Turn right onto the faint road and follow it for 0.4 miles to a witness post on the right (east) side of the road. Walk 85 paces from the witness post to the 0-foot stake at 64 degrees magnetic. The 0-foot stake is marked by browse tag #103.

| Site Information | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SWEET WATER |
| Elevation | 7,691ft (2,344m) |
| Aspect | West |
| Slope | 7% |
| Sample Dates | 07/06/1998, 06/07/2000, 06/22/2010, 06/11/2015, 06/04/2020, 06/25/2025 |

**Table 10R-17.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Prescribed | Upper Bookcliffs Prescribed Fire 1998 | LTDL 12168-32921 | September 1998 | 484 |

## Wildlife Habitat and Vegetation History

**Table 10R-17.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10R-17.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1998 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2000 | Perennial Grass | No Encroachment |
| 2010 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2015 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2020 | Perennial Grass/Mixed Shrub | No Encroachment |
| 2025 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 10R-17.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 6.7 | 72.7 | 14.7 | 12.6 | 2.4 | 13.6 | 92.8 | 0.9 | 07/06/1998 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1998 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1<br>2000-2010 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.2<br>2015-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

When the study was established in 1998, the plant community on this site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Much of the browse component was removed following the prescribed fire in 1998 (Table 10R-17.1). Since 2000, native and introduced perennial grasses such as needle and thread (*Hesperostipa comata*) and intermediate wheatgrass (*Thinopyrum intermedium*) have been a dominant site component. Prior to the fire, however, the herbaceous understory was dominated by the perennial grass Kentucky bluegrass (*Poa pratensis*). Throughout the sample period, forbs have remained rare in comparison with grasses (Table 10R-17.7, Table 10R-17.10, Table 10R-17.11). The shrub community began to re-establish as early as 2010 and mixed shrub species such as mountain big sagebrush and mountain snowberry (*Symphoricarpos oreophilus*) were a co-dominant vegetation component from that time through the 2020 year. However, mountain big sagebrush cover and density notably increased between the two most recent sample years, and mountain big sagebrush was co-dominant with perennial grasses in 2025 (Table 10R-17.12, 10R-17.13).

The diverse and abundant grass community on this site could provide adequate forage for summering mule deer. However, pellet transect data indicates that deer presence has remained very low in most sample years. Elk presence was moderate in all years sampled except 2000 when it was considered to be high. During the 2024/25 winter season the area had occasional occurrences of nearby collared elk (Wildlife Migration Initiative). Bison and/or cattle presence was high between 2010 and 2020 (Photos, Table 10R-17.9, Table 10R-17.10, Table 10R-17.11). On-site observations state that there was light utilization (10-20%) of the herbaceous understory during the most recent sample year (2025).

## Trend Summary Tables

**Table 10R-17.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1998 | 29.2 | 1.0 | - | - | - | - |
| 2000 | 1.6 | - | - | - | - | - |
| 2010 | 6.3 | 1.5 | - | 7.5 | 2.1 | - |
| 2015 | 10.8 | 2.5 | - | 12.6 | 3.8 | - |
| 2020 | 15.0 | 3.1 | - | 15.5 | 3.0 | - |
| 2025 | 35.6 | 4.8 | - | 33.7 | 6.5 | - |

**Table 10R-17.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1998 | 7 | 453 | 28 | 91 | 0.0 | 35.1 | 0.2 | 1.7 |
| 2000 | 1 | 435 | 65 | 130 | 0.0 | 28.8 | 1.1 | 2.8 |
| 2010 | 154 | 417 | 259 | 130 | 3.8 | 32.4 | 3.6 | 1.3 |
| 2015 | 172 | 440 | 141 | 74 | 3.7 | 45.0 | 1.1 | 1.3 |
| 2020 | 94 | 430 | 157 | 114 | 0.3 | 38.3 | 1.3 | 1.9 |
| 2025 | - | 391 | 54 | 69 | - | 28.9 | 0.2 | 1.1 |

**Table 10R-17.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1998 | 8.1 | 1.0 | 67.9 | 2.3 | 0.1 | 68.1 |
| 2000 | 35.0 | 0.0 | 30.4 | 7.2 | 1.2 | 37.5 |
| 2010 | 18.4 | 0.0 | 52.1 | 3.3 | 0.2 | 56.9 |
| 2015 | 21.9 | 0.2 | 33.5 | 4.3 | 0.4 | 61.6 |
| 2020 | 25.4 | 0.0 | 33.6 | 9.5 | 0.3 | 53.2 |
| 2025 | 18.8 | 0.0 | 38.9 | 1.5 | 0.4 | 61.9 |

**Table 10R-17.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1998 | 4 | - | 3 | - |
| 2000 | 2 | 1 | 27 | 1 |
| 2010 | 15 | 10 | 9 | 2 |
| 2015 | 14 | 1 | 22 | - |
| 2020 | 6 | 11 | 13 | 3 |
| 2025 | 3 | 15 | 30 | 8 |
| Year | Days Use Per Acre (ha) | | | |
| 1998 | - | - | - | - |
| 2000 | - | 12.1 (29.8) | 54.9 (135.7) | - |
| 2010 | 47.9 (118.4) | 26.2 (64.6) | 8.1 (19.9) | - |
| 2015 | 43.6 (107.6) | 2.7 (6.6) | 29.5 (72.8) | - |
| 2020 | 42.8 (105.8) | 2.0 (5.0) | 26.8 (66.2) | - |
| 2025 | - | 4.0 (9.9) | 25.5 (62.9) | - |

**Table 10R-17.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bouteloua gracilis (blue grama) | Bromus porteri (Porter brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Leymus cinereus (basin wildrye) | Poa bulbosa[i] (bulbous bluegrass) | Poa pratensis[i] (Kentucky bluegrass) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1998 | 11 | - | 24 | - | 7 | 3 | 15 | - | 102 | 9 | - | 410 | - | 50 |
| 2000 | 4 | - | 17 | - | 1 | 2 | 6 | - | 84 | 8 | - | 394 | - | 143 |
| 2010 | 4 | - | 15 | 5 | 154 | 13 | - | - | 231 | 7 | - | 197 | 28 | 215 |
| 2015 | 18 | 7 | 8 | - | 172 | - | - | - | 251 | 11 | 1 | 152 | 6 | 264 |
| 2020 | 1 | 3 | 20 | - | 94 | 3 | 6 | - | 313 | 10 | - | 55 | 56 | 258 |
| 2025 | 16 | - | 26 | - | - | 9 | - | 33 | 277 | 8 | - | 16 | 59 | 166 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1998 | 0.5 | - | 0.7 | - | 0.0 | 0.1 | 0.1 | - | 6.9 | 1.0 | - | 25.1 | - | 0.6 |
| 2000 | 0.3 | - | 0.1 | - | 0.0 | 0.1 | 0.1 | - | 4.2 | 1.6 | - | 18.8 | - | 3.7 |
| 2010 | 0.2 | - | 0.4 | 0.1 | 3.8 | 0.5 | - | - | 15.2 | 0.8 | - | 7.6 | 0.2 | 7.2 |
| 2015 | 1.2 | 0.3 | 0.6 | - | 3.7 | - | - | - | 22.9 | 2.4 | 0.0 | 6.5 | 0.1 | 10.9 |
| 2020 | 0.0 | 0.0 | 1.6 | - | 0.3 | 0.0 | 0.0 | - | 24.2 | 1.8 | - | 0.7 | 1.3 | 8.5 |
| 2025 | 1.3 | - | 1.1 | - | - | 0.1 | - | 0.1 | 21.1 | 1.0 | - | 0.1 | 1.4 | 2.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-17.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Astragalus convallarius (lesser rushy milkvetch) | Castilleja (Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Corydalis aurea[a] (scrambled eggs) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum umbellatum (sulphur-flower buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Lithospermum incisum (narrowleaf stoneseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1998 | 4 | - | - | 17 | 7 | 2 | 14 | - | - | - | 10 | - | - | - | - | - | - |
| 2000 | 10 | 3 | - | 4 | 6 | - | 13 | - | 5 | - | 3 | - | 3 | - | - | - | - |
| 2010 | 2 | - | - | - | 3 | - | - | 9 | - | - | - | - | 8 | 3 | 253 | - | - |
| 2015 | - | - | - | 4 | - | - | - | - | - | 5 | - | - | 2 | 4 | 134 | 1 | - |
| 2020 | - | - | 42 | - | - | - | - | - | - | - | - | - | 1 | 7 | 99 | - | 3 |
| 2025 | - | 2 | 22 | - | - | - | - | - | - | - | - | 2 | - | 1 | 3 | - | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1998 | 0.1 | - | - | 0.0 | 0.0 | 0.0 | 0.1 | - | - | - | 0.1 | - | - | - | - | - | - |
| 2000 | 0.5 | 0.0 | - | 0.0 | 0.1 | - | 0.0 | - | 0.0 | - | 0.1 | - | 0.0 | - | - | - | - |
| 2010 | 0.0 | - | - | - | 0.0 | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | 3.5 | - | - |
| 2015 | - | - | - | 0.0 | - | - | - | - | - | 0.1 | - | - | 0.0 | 0.0 | 1.0 | 0.0 | - |
| 2020 | - | - | 0.1 | - | - | - | - | - | - | - | - | - | 0.0 | 0.1 | 0.3 | - | 0.0 |
| 2025 | - | 0.0 | 0.0 | - | - | - | - | - | - | - | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera grindelioides (rayless tansyaster) | Oenothera pallida ssp. trichocalyx[a] (pale evening primrose) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon comarrhenus (dusty beardtongue) | Penstemon watsonii (Watson's penstemon) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1998 | - | 3 | 38 | 19 | - | - | 3 | - | 2 | 2 | - | 12 | 10 |
| 2000 | - | 46 | 18 | 22 | - | - | 77 | - | 3 | - | 4 | 13 | 10 |
| 2010 | - | - | 18 | 17 | - | - | 75 | - | 7 | - | - | 21 | 2 |
| 2015 | - | 4 | 37 | 11 | - | - | - | - | 7 | - | - | 19 | 6 |
| 2020 | 6 | - | 11 | 20 | - | - | 75 | 48 | 5 | - | - | 10 | 17 |
| 2025 | 4 | 23 | 11 | - | 15 | 12 | 27 | 7 | 4 | - | - | 9 | - |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1998 | - | 0.1 | 0.2 | 0.8 | - | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.0 |
| 2000 | - | 1.0 | 0.3 | 0.8 | - | - | 0.6 | - | 0.0 | - | 0.0 | 0.3 | 0.0 |
| 2010 | - | - | 0.1 | 0.5 | - | - | 0.5 | - | 0.0 | - | - | 0.2 | 0.0 |
| 2015 | - | 0.1 | 0.4 | 0.0 | - | - | - | - | 0.0 | - | - | 0.6 | 0.0 |
| 2020 | 0.1 | - | 0.2 | 1.0 | - | - | 0.3 | 0.2 | 0.1 | - | - | 0.1 | 0.7 |
| 2025 | 0.1 | 0.1 | 0.1 | - | 0.1 | 0.6 | 0.1 | 0.0 | 0.0 | - | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-17.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus (yellow rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. speciosa[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Peraphyllum ramosissimum[p] (wild crab apple) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2010 | - | 0.8 | 2.5 | 0.4 | - | 1.7 | - | - | - | 4.2 |
| 2015 | - | 2.6 | 5.9 | 0.6 | 0.1 | 3.1 | - | - | 0.3 | 3.8 |
| 2020 | 1.3 | 0.3 | 9.1 | - | 0.2 | 2.8 | 0.8 | - | 0.2 | 3.8 |
| 2025 | - | 0.9 | 25.2 | - | 0.6 | 5.7 | - | 0.2 | 0.1 | 7.5 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1998 | - | - | 21.5 | 0.1 | - | 0.9 | - | - | - | 7.7 |
| 2000 | - | - | 0.2 | - | - | - | - | - | - | 1.5 |
| 2010 | - | 0.8 | 1.6 | 0.0 | - | 1.4 | - | 0.0 | - | 3.9 |
| 2015 | - | 3.3 | 4.2 | 0.0 | 0.0 | 2.5 | - | - | 0.1 | 3.2 |
| 2020 | 1.9 | 0.8 | 8.4 | - | 0.4 | 2.7 | 0.8 | 0.0 | 0.0 | 3.2 |
| 2025 | - | 0.9 | 26.4 | - | 1.2 | 3.6 | - | 0.1 | 0.0 | 8.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

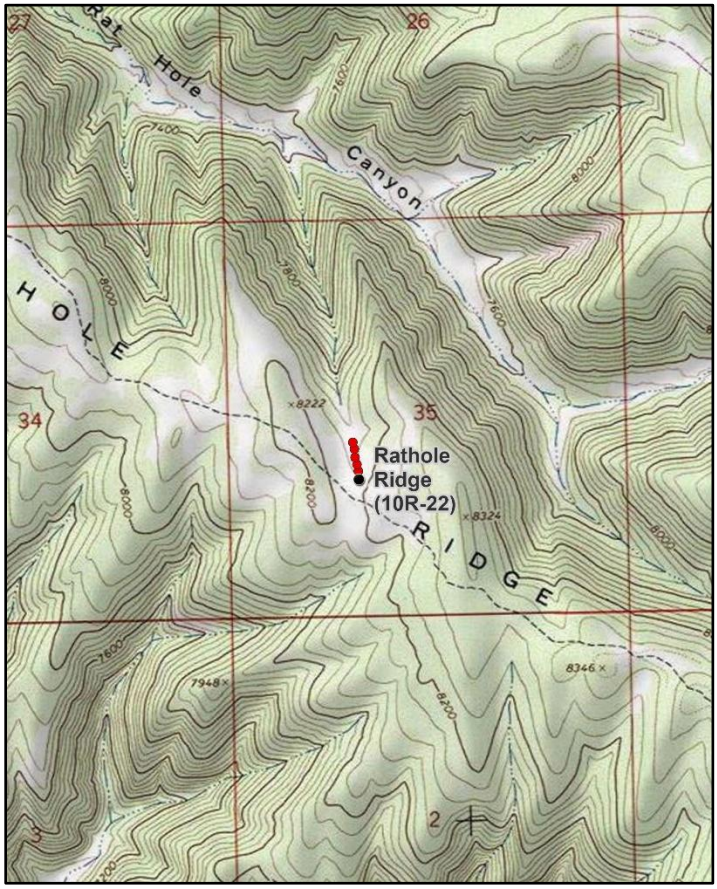
**Table 10R-17.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

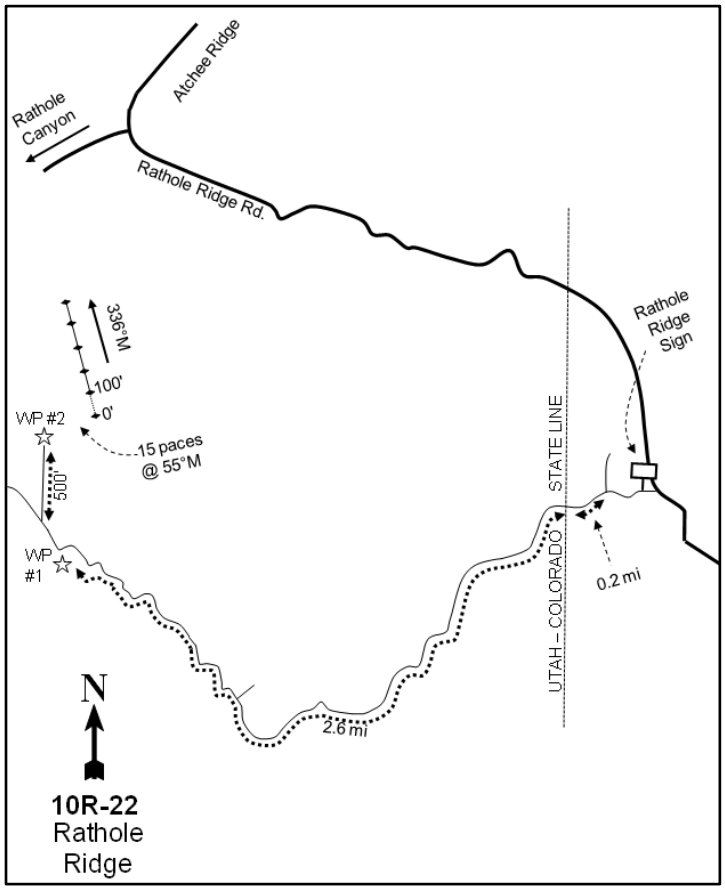
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 41/70 |
| 2020 | 580 | 40 | 62 | 28 | 10 | 14 | 0 | 10 | 58/86 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 5380 | 980 | 38 | 62 | 0 | 0 | 0 | 0 | 11/15 |
| 2015 | 10560 | 1360 | 35 | 65 | 0 | 28 | 0 | 2 | 17/22 |
| 2020 | 2100 | 200 | 36 | 57 | 7 | 21 | 1 | 8 | 14/21 |
| 2025 | 3080 | 40 | 14 | 85 | 1 | 4 | 1 | 3 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1998 | 3740 | 60 | 8 | 68 | 24 | 16 | 1 | 21 | 101/116 |
| 2000 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | 12/22 |
| 2010 | 1180 | 40 | 44 | 56 | 0 | 2 | 0 | 0 | 59/92 |
| 2015 | 940 | - | 43 | 55 | 2 | 51 | 0 | 4 | 46/71 |
| 2020 | 3060 | 18200 | 75 | 24 | 1 | 2 | 0 | 2 | 57/84 |
| 2025 | 32040 | 1720 | 68 | 31 | 0 | 11 | 3 | 0 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 38/56 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 63/66 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1998 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 51/40 |
| 2000 | 60 | - | 100 | 0 | 0 | 67 | 0 | 0 | 12/12 |
| 2010 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 27/39 |
| 2015 | 60 | - | 0 | 100 | 0 | 67 | 0 | 0 | 24/33 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 220 | 20 | 0 | 100 | 0 | 18 | 73 | 27 | 30/37 |
| 2020 | 80 | 20 | 25 | 75 | 0 | 0 | 0 | 0 | 24/34 |
| 2025 | 220 | - | 0 | 100 | 0 | 36 | 18 | 0 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1998 | 580 | - | 14 | 83 | 3 | 0 | 0 | 0 | 94/100 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 60/68 |
| 2010 | 200 | - | 30 | 70 | 0 | 10 | 10 | 0 | 85/129 |
| 2015 | 320 | - | 44 | 56 | 0 | 19 | 6 | 13 | 80/121 |
| 2020 | 200 | - | 0 | 20 | 80 | 40 | 40 | 80 | 74/111 |
| 2025 | 500 | - | 8 | 88 | 4 | 36 | 16 | 4 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa ssp. nauseosa var. speciosa[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 100 | 0 | 100 | - / - |
| 2020 | 100 | - | 20 | 80 | 0 | 20 | 0 | 20 | 102/136 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/23 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 40 | 40 | 50 | 0 | 50 | 0 | 0 | 50 | 14/24 |
| 2025 | 120 | 60 | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 33 | 67 | 0 | 100 | 0 | 0 | - / - |
| 2010 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 14/19 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 12/36 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Peraphyllum ramosissimum[p] -- (wild crab apple) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 17/40 |
| 2015 | 320 | - | 38 | 63 | 0 | 13 | 19 | 0 | 25/25 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 38/63 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1998 | 2580 | 40 | 31 | 62 | 7 | 14 | 10 | 8 | 69/94 |
| 2000 | 1360 | - | 54 | 46 | 0 | 50 | 28 | 0 | 18/38 |
| 2010 | 1280 | - | 27 | 73 | 0 | 13 | 0 | 0 | 41/76 |
| 2015 | 1260 | - | 24 | 75 | 2 | 51 | 37 | 5 | 49/82 |
| 2020 | 740 | - | 11 | 89 | 0 | 27 | 3 | 0 | 59/100 |
| 2025 | 1380 | 100 | 19 | 77 | 4 | 23 | 19 | 4 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 20/30 |
| 2015 | - | - | - | - | - | - | - | - | 18/32 |
| 2020 | - | - | - | - | - | - | - | - | 21/40 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# RATHOLE RIDGE - STUDY NO. 10R-22




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Rat Hole Ridge SW; Township 14S, Range 25E, Section 35 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 664191 East 4380011 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 111 |
| Transect Bearing | 336° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the junction of Atchee Ridge Road, Rathole Canyon, and Rathole Ridge Road, follow Rathole Ridge Road up to a sign pointing to Rathole Ridge: take this road to the first fork. Make a left turn at the fork and continue down the canyon 0.2 miles to the state line. Continue 2.6 miles (staying left) to a witness post on the left (south) side of the road. Just past the witness post an old road breaks off to the right: follow it about 500 feet to another witness post on the right (east) side of the road. From this second witness post the 0-foot stake is 15 paces at 55 degrees magnetic and is marked with browse tag #111.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | ATCHEE RIDGE AMP |
| Elevation | 8,186ft (2,495m) |
| Aspect | Northwest |
| Slope | 6% |
| Sample Dates | 07/09/1998, 06/13/2000, 06/08/2005, 06/09/2010, 06/03/2015, 08/11/2020, 06/11/2025 |

**Table 10R-22.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Prescribed | Bookcliffs Mountain Browse Prescribed Fire 1999 | LTDL 1316-3715 | October 1999 | 1311 |

## Wildlife Habitat and Vegetation History

**Table 10R-22.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |

**Table 10R-22.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1998 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Perennial Grass | Early Phase I |
| 2005 | Perennial Grass | No Encroachment |
| 2010 | Perennial Grass | Early Phase I |
| 2015 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10R-22.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 6.3 | 40.0 | 37.4 | 22.6 | 3.6 | 11.9 | 124.8 | 0.9 | 07/09/1998 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 1998 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1<br>2000-2010 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.2<br>2015-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

When the study was established in 1998, the plant community on this site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Much of the browse component was removed following the prescribed fire in 1999 (Table 10R-22.1), causing a transition to a perennial grass plant community that has included needle and thread (*Hesperostipa comata*), Kentucky bluegrass (*Poa pratensis*), and obtuse sedge (*Carex obtusata*), among others. Forbs within the understory have remained abundant since the fire (Table 10R-22.10, Table 10R-22.11). Mountain big sagebrush began to re-establish in 2005 and became a co-dominant site component with perennial grasses in 2015 (Table 10R-22.12). Due to the relatively high resilience of this community type, sagebrush and its community allies on this site will likely continue to recover. Rocky Mountain juniper (*Juniperus scopulorum*) and Utah juniper (*J. osteosperma*) have been observed in low amounts nearly every sample year (Table 10R-22.13, Table 10R-22.14). There may be potential for further tree infilling, but the site has remained within Early Phase I of woodland succession in most years since 1998 (Table 10R-22.4): this indicates that infilling is likely not an immediate concern.

The diverse and abundant grass and browse communities on this site could provide adequate forage for summering mule deer. However, pellet transect data indicates that deer presence has remained low in most sample years but was high in 2010. Elk presence was moderate in all sample years since 2000, except in 2005 and 2025 when presence was considered to be high. Bison and/or cattle presence has generally remained moderate in most sample years, but presence was high in 2020 (Photos, Table 10R-22.9, Table 10R-22.10, Table 10R-22.11). On-site observations state that there was light utilization (10-20%) of the herbaceous understory during the most recent sample year (2025).

## Trend Summary Tables

**Table 10R-22.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1998 | 24.4 | 0.8 | - | - | - | - |
| 2000 | 5.1 | 0.2 | - | - | - | - |
| 2005 | 5.8 | 1.0 | - | 7.2 | 2.4 | - |
| 2010 | 5.4 | 1.4 | - | 7.1 | 1.4 | - |
| 2015 | 12.5 | 2.0 | - | 14.4 | 3.8 | - |
| 2020 | 26.8 | 3.8 | - | 27.8 | 4.3 | - |
| 2025 | 35.3 | 5.5 | - | 39.5 | 4.7 | - |

**Table 10R-22.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1998 | 2 | 425 | 61 | 355 | 0.0 | 18.2 | 0.5 | 21.1 |
| 2000 | - | 397 | 8 | 390 | - | 15.4 | 0.0 | 21.5 |
| 2005 | - | 449 | 132 | 316 | - | 37.3 | 1.1 | 14.1 |
| 2010 | - | 446 | 68 | 311 | - | 23.2 | 0.9 | 11.2 |
| 2015 | - | 471 | 145 | 290 | - | 40.7 | 1.3 | 10.9 |
| 2020 | - | 424 | 187 | 248 | - | 27.3 | 2.7 | 8.9 |
| 2025 | - | 447 | 127 | 322 | - | 35.0 | 2.1 | 14.0 |

**Table 10R-22.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1998 | 14.8 | 1.0 | 58.5 | 0.3 | 0.1 | 62.5 |
| 2000 | 28.3 | 0.1 | 50.7 | 0.3 | 0.2 | 45.9 |
| 2005 | 20.5 | - | 34.5 | 0.1 | 0.4 | 56.3 |
| 2010 | 17.8 | - | 44.9 | 0.0 | 0.0 | 52.1 |
| 2015 | 14.3 | 0.1 | 41.7 | 0.2 | 0.2 | 66.3 |
| 2020 | 12.9 | 0.8 | 49.3 | 0.1 | 0.2 | 57.9 |
| 2025 | 11.8 | 0.1 | 61.0 | 0.4 | 0.2 | 71.7 |

**Table 10R-22.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1998 | 8 | - | 14 | - |
| 2000 | - | 8 | 34 | 4 |
| 2005 | 8 | 15 | 58 | 14 |
| 2010 | 9 | 1 | 45 | 1 |
| 2015 | 10 | 6 | 21 | - |
| 2020 | 23 | 9 | 13 | 1 |
| 2025 | 4 | 7 | 32 | 3 |
| Year | Days Use Per Acre (ha) | | | |
| 1998 | - | - | - | - |
| 2000 | 0.7 (1.8) | 2.0 (5.0) | 32.8 (81.1) | - |
| 2005 | 13.8 (34.1) | 16.1 (39.7) | 55.6 (137.4) | - |
| 2010 | 16.0 (39.5) | 49.6 (122.5) | 14.7 (36.4) | - |
| 2015 | 20.3 (50.2) | 9.4 (23.2) | 27.5 (67.9) | - |
| 2020 | 42.8 (105.8) | 7.4 (18.2) | 20.1 (49.7) | - |
| 2025 | 26.8 (66.3) | 6.0 (14.9) | 51.6 (127.5) | - |

**Table 10R-22.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bouteloua gracilis (blue grama) | Bromus marginatus (mountain brome) | Bromus tectorum[ai] (cheatgrass) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1998 | - | 15 | - | 29 | 2 | 3 | - | 13 | 184 | 183 | 42 | - | 69 | 156 | - |
| 2000 | - | 76 | 1 | 5 | - | 54 | - | - | 222 | 137 | 36 | - | 43 | 162 | 14 |
| 2005 | - | 64 | - | - | - | 56 | - | 1 | 225 | 193 | 13 | - | 29 | 202 | 115 |
| 2010 | - | 13 | - | - | - | 139 | - | - | 228 | 81 | 22 | - | 44 | 235 | 60 |
| 2015 | - | 5 | - | - | - | 281 | - | - | 193 | 19 | 15 | - | 95 | 245 | 7 |
| 2020 | 10 | 25 | - | 1 | - | 108 | - | - | 190 | 257 | 12 | - | 3 | 66 | 10 |
| 2025 | 21 | 29 | - | - | - | 206 | 9 | 7 | 55 | 217 | 10 | 227 | 54 | 33 | 60 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1998 | - | 0.3 | - | 0.3 | 0.0 | 0.0 | - | 0.1 | 2.0 | 6.7 | 0.5 | - | 1.4 | 6.8 | - |
| 2000 | - | 1.1 | 0.0 | 0.1 | - | 0.7 | - | - | 3.2 | 5.7 | 0.4 | - | 0.9 | 3.1 | 0.2 |
| 2005 | - | 3.8 | - | - | - | 0.6 | - | 0.0 | 5.9 | 12.7 | 0.5 | - | 0.7 | 10.6 | 2.4 |
| 2010 | - | 0.7 | - | - | - | 2.7 | - | - | 3.9 | 2.5 | 0.3 | - | 1.1 | 9.3 | 2.7 |
| 2015 | - | 0.0 | - | - | - | 16.2 | - | - | 4.7 | 0.6 | 0.2 | - | 4.4 | 14.5 | 0.1 |
| 2020 | 0.4 | 1.8 | - | 0.0 | - | 2.3 | - | - | 4.8 | 16.3 | 0.1 | - | 0.0 | 1.4 | 0.1 |
| 2025 | 1.2 | 1.3 | - | - | - | 4.1 | 0.3 | 0.1 | 1.5 | 14.8 | 0.1 | 7.9 | 1.3 | 0.5 | 1.9 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-22.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Arenaria congesta (ballhead sandwort) | Astragalus cibarius (browse milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Astragalus tenellus (looseflower milkvetch) | Astragalus wingatanus (Fort Wingate milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1998 | 18 | - | - | 11 | 27 | - | - | 8 | 227 | - | 13 | 155 | - | - | 3 | 97 | - |
| 2000 | 25 | 41 | 1 | - | 21 | - | - | - | 209 | - | 33 | 168 | - | - | - | 82 | - |
| 2005 | 10 | 57 | - | 32 | 13 | - | - | - | 173 | - | 4 | 79 | - | - | 0 | 3 | - |
| 2010 | 14 | 159 | - | 9 | 16 | - | - | - | - | - | 10 | 52 | - | - | 4 | - | 6 |
| 2015 | 11 | 20 | - | 79 | 20 | - | - | 4 | 69 | 3 | 7 | 51 | 2 | - | - | 2 | - |
| 2020 | 5 | 4 | - | - | 14 | - | - | - | 108 | - | 8 | 45 | - | - | - | 21 | - |
| 2025 | 5 | 37 | - | 5 | - | 26 | 5 | 5 | 77 | - | 13 | 50 | - | 1 | - | 25 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1998 | 0.2 | - | - | 0.1 | 0.7 | - | - | 0.0 | 3.2 | - | 0.2 | 6.2 | - | - | 0.0 | 2.0 | - |
| 2000 | 0.6 | 0.2 | 0.0 | - | 0.6 | - | - | - | 4.2 | - | 0.3 | 5.8 | - | - | - | 1.6 | - |
| 2005 | 0.2 | 1.1 | - | 0.3 | 0.7 | - | - | - | 2.9 | - | 0.0 | 1.2 | - | - | 0.0 | 0.0 | - |
| 2010 | 0.3 | 3.1 | - | 0.2 | 0.3 | - | - | - | - | - | 0.1 | 0.9 | - | - | 0.0 | - | 0.2 |
| 2015 | 0.1 | 0.1 | - | 0.3 | 1.1 | - | - | 0.0 | 0.6 | 0.0 | 0.0 | 1.6 | 0.0 | - | - | 0.0 | - |
| 2020 | 0.1 | 0.0 | - | - | 0.8 | - | - | - | 1.5 | - | 0.1 | 1.6 | - | - | - | 0.7 | - |
| 2025 | 0.1 | 0.1 | - | 0.0 | - | 1.7 | 0.2 | 0.0 | 1.0 | - | 0.2 | 1.6 | - | 0.0 | - | 0.7 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Chenopodium atrovirens[a] (pinyon goosefoot) | Cirsium pulcherrimum (Wyoming thistle) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum (buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Geranium richardsonii (Richardson's geranium) | Hackelia patens (spotted stickseed) | Heliomeris multiflora var. multiflora (showy goldeneye) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1998 | - | - | - | 100 | 4 | - | 1 | 12 | - | 2 | 25 | - | 36 | 1 | 9 | - | - |
| 2000 | - | - | - | 125 | - | - | 1 | 39 | - | - | 8 | 1 | 52 | 21 | - | - | - |
| 2005 | 6 | - | - | 75 | 25 | - | 3 | 9 | - | - | 28 | 16 | 24 | 8 | - | - | - |
| 2010 | 15 | - | - | 19 | 12 | - | 4 | 23 | 6 | - | 3 | 2 | 26 | 4 | - | 5 | - |
| 2015 | 1 | - | 9 | 94 | - | 9 | - | 31 | 3 | - | 16 | 4 | 24 | 2 | - | 2 | - |
| 2020 | - | - | 1 | 15 | - | - | - | 19 | - | - | 13 | - | 25 | - | - | 4 | - |
| 2025 | 2 | 1 | 13 | 57 | - | - | - | 30 | - | - | 19 | 8 | 22 | - | 2 | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1998 | - | - | - | 1.4 | 0.0 | - | 0.0 | 0.1 | - | 0.0 | 0.6 | - | 1.8 | 0.0 | 0.3 | - | - |
| 2000 | - | - | - | 1.7 | - | - | 0.0 | 0.2 | - | - | 0.1 | 0.0 | 1.2 | 0.1 | - | - | - |
| 2005 | 0.0 | - | - | 1.4 | 0.1 | - | 0.0 | 0.0 | - | - | 0.6 | 0.0 | 0.8 | 0.1 | - | - | - |
| 2010 | 0.3 | - | - | 0.2 | 0.1 | - | 0.0 | 0.3 | 0.0 | - | 0.0 | 0.0 | 0.9 | 0.0 | - | 0.0 | - |
| 2015 | 0.0 | - | 0.0 | 1.0 | - | 0.0 | - | 0.1 | 0.0 | - | 0.3 | 0.0 | 0.6 | 0.0 | - | 0.0 | - |
| 2020 | - | - | 0.0 | 0.1 | - | - | - | 0.2 | - | - | 0.2 | - | 0.3 | - | - | 0.1 | - |
| 2025 | 0.0 | 0.0 | 0.3 | 0.7 | - | - | - | 0.6 | - | - | 0.7 | 0.0 | 0.6 | - | 0.1 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lupinus argenteus (silvery lupine) | Mertensia ciliata (tall fringed bluebells) | Microsteris gracilis[a] (slender phlox) | Penstemon caespitosus (mat penstemon) | Penstemon watsonii (Watson's penstemon) | Penstemon whippleanus (Whipple's penstemon) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Potentilla hippiana (woolly cinquefoil) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Thalictrum fendleri (Fendler's meadow-rue) | Tragopogon dubius[ai] (yellow salsify) | unknown perennial forb (unknown forb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1998 | 28 | - | - | 18 | 64 | - | 15 | 44 | - | 19 | 5 | - | - | 15 | - | 2 | - |
| 2000 | 29 | - | - | 27 | 58 | - | 46 | 2 | 14 | 27 | - | - | 45 | 29 | 1 | 3 | - |
| 2005 | - | - | - | 24 | 43 | - | 58 | 77 | 24 | 13 | 19 | - | 17 | 22 | - | - | 30 |
| 2010 | 5 | - | - | 13 | 51 | - | 61 | 4 | 28 | - | 34 | - | 44 | 16 | - | - | - |
| 2015 | 0 | - | 40 | 25 | 28 | - | 97 | 38 | 17 | 14 | 36 | - | 67 | 67 | - | 24 | - |
| 2020 | 3 | - | - | 15 | 17 | - | 72 | 176 | 13 | 9 | 15 | - | 54 | 14 | - | - | - |
| 2025 | 11 | 8 | 100 | 24 | 18 | 14 | 166 | 13 | 25 | 5 | 31 | 3 | 30 | 17 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1998 | 1.2 | - | - | 0.4 | 1.6 | - | 0.1 | 0.4 | - | 0.9 | 0.0 | - | - | 0.2 | - | 0.0 | - |
| 2000 | 1.0 | - | - | 0.3 | 1.0 | - | 0.1 | 0.0 | 1.0 | 0.8 | - | - | 0.6 | 0.2 | 0.0 | 0.0 | - |
| 2005 | - | - | - | 0.9 | 1.4 | - | 0.3 | 0.2 | 1.2 | 0.6 | 0.6 | - | 0.3 | 0.2 | - | - | 0.1 |
| 2010 | 0.0 | - | - | 0.4 | 1.4 | - | 0.8 | 0.0 | 0.8 | - | 0.4 | - | 1.2 | 0.3 | - | - | - |
| 2015 | 0.0 | - | 0.2 | 0.3 | 0.6 | - | 0.7 | 0.1 | 0.5 | 0.5 | 0.6 | - | 1.8 | 0.8 | - | 0.1 | - |
| 2020 | 0.0 | - | - | 0.2 | 0.7 | - | 0.5 | 2.2 | 0.5 | 0.2 | 0.4 | - | 1.1 | 0.1 | - | - | - |
| 2025 | 0.1 | 0.1 | 1.5 | 0.3 | 1.1 | 0.4 | 1.5 | 0.0 | 1.0 | 0.0 | 0.5 | 0.0 | 0.8 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-22.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Mahonia repens (creeping barberry) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.8 | 3.3 | - | - | 2.3 | - | 0.2 | 0 | 2.9 | 0.1 |
| 2010 | 0.8 | 4.3 | - | - | 1.3 | - | 0.4 | 0 | 1.6 | 0.1 |
| 2015 | 0.8 | 10.9 | - | 0.2 | 3.6 | - | 0.4 | - | 2.1 | 0.2 |
| 2020 | 1.5 | 22 | - | 0.3 | 4.1 | 0.1 | 0.5 | - | 3.5 | 0.1 |
| 2025 | 1.6 | 34.1 | - | - | 4.2 | - | 0.7 | - | 3.1 | 0.5 |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1998 | 0.8 | 21.7 | - | - | 0.7 | - | 0.0 | - | 1.9 | 0.1 |
| 2000 | 0.6 | 2.3 | - | - | 0.2 | - | 0.1 | 0.1 | 2.0 | 0.0 |
| 2005 | 0.8 | 2.4 | - | 0.1 | 0.9 | - | 0.0 | 0.4 | 2.1 | 0.1 |
| 2010 | 0.4 | 3.0 | - | 0.1 | 1.3 | - | 0.1 | 0.1 | 1.6 | 0.1 |
| 2015 | 0.7 | 9.9 | - | 0.1 | 2.0 | - | 0.1 | 0.0 | 1.6 | 0.1 |
| 2020 | 1.0 | 22.3 | - | 0.3 | 3.6 | 0.0 | 0.4 | - | 2.8 | 0.2 |
| 2025 | 0.9 | 29.7 | 0.0 | - | 5.4 | - | 0.6 | 0.1 | 3.9 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-22.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1998 | 180 | - | 44 | 56 | 0 | 56 | 0 | 11 | 168/127 |
| 2000 | 240 | - | 67 | 25 | 8 | 8 | 0 | 0 | 189/160 |
| 2005 | 200 | - | 60 | 40 | 0 | 20 | 0 | 0 | 76/85 |
| 2010 | 100 | - | 80 | 20 | 0 | 0 | 20 | 0 | 56/67 |
| 2015 | 100 | - | 0 | 100 | 0 | 60 | 40 | 20 | 85/92 |
| 2020 | 140 | - | 43 | 57 | 0 | 29 | 0 | 0 | 97/99 |
| 2025 | 160 | 20 | 13 | 88 | 0 | 13 | 50 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1998 | 4060 | 520 | 20 | 69 | 11 | 2 | 3 | 6 | 89/118 |
| 2000 | 540 | 80 | 30 | 48 | 22 | 11 | 0 | 0 | 65/62 |
| 2005 | 1100 | 1020 | 47 | 46 | 7 | 20 | 7 | 6 | 45/56 |
| 2010 | 2560 | - | 38 | 56 | 6 | 31 | 6 | 10 | 38/53 |
| 2015 | 7700 | 1200 | 52 | 48 | 0 | 43 | 0 | 2 | 40/59 |
| 2020 | 9740 | 3540 | 61 | 39 | 0 | 9 | 12 | 5 | 56/77 |
| 2025 | 8300 | 440 | 28 | 68 | 5 | 26 | 14 | 5 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 5/25 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/22 |
| 2010 | 1480 | - | 74 | 26 | 0 | 0 | 0 | 0 | 4/18 |
| 2015 | 100 | - | 0 | 100 | 0 | 100 | 0 | 0 | 7/19 |
| 2020 | 140 | - | 14 | 86 | 0 | 57 | 43 | 43 | 22/28 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1998 | 920 | - | 24 | 76 | 0 | 0 | 0 | 0 | 34/38 |
| 2000 | 820 | - | 32 | 68 | 0 | 0 | 5 | 0 | 25/26 |
| 2005 | 940 | 520 | 13 | 85 | 2 | 11 | 4 | 2 | 26/40 |
| 2010 | 2120 | - | 28 | 72 | 0 | 0 | 3 | 0 | 26/43 |
| 2015 | 2500 | 120 | 22 | 74 | 4 | 20 | 2 | 5 | 28/43 |
| 2020 | 2060 | - | 3 | 96 | 1 | 15 | 7 | 10 | 33/50 |
| 2025 | 2860 | - | 11 | 88 | 1 | 55 | 14 | 4 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 54/68 |
| 2010 | - | - | - | - | - | - | - | - | 59/66 |
| 2015 | - | - | - | - | - | - | - | - | 60/108 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1998 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 100 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/13 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/8 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

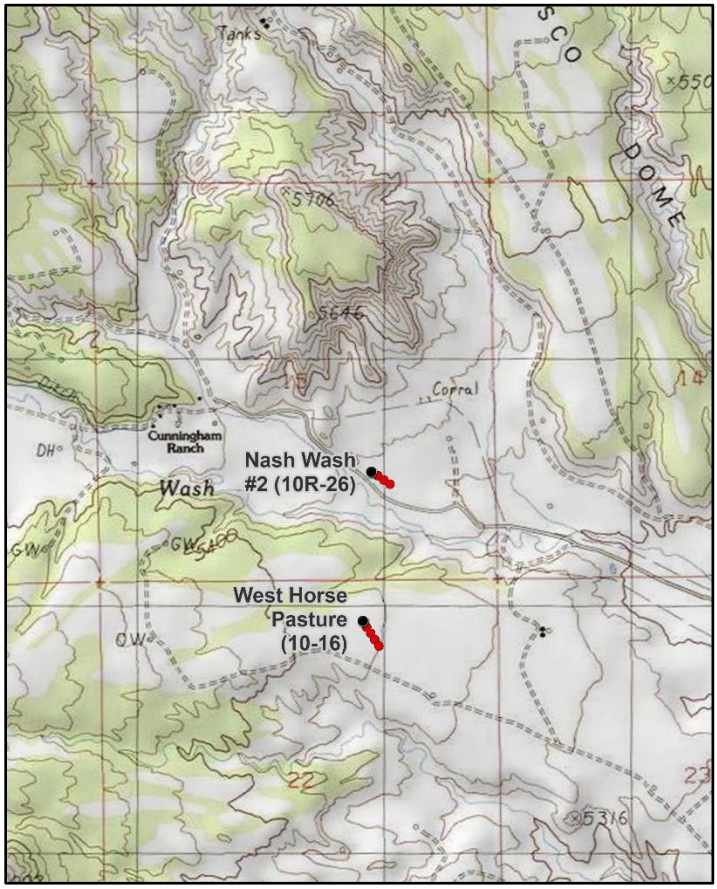
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1998 | 60 | - | 67 | 33 | 0 | 33 | 0 | 0 | 57/157 |
| 2000 | 140 | - | 86 | 14 | 0 | 0 | 0 | 0 | 35/65 |
| 2005 | 40 | - | 0 | 100 | 0 | 50 | 50 | 0 | 25/56 |
| 2010 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | 31/70 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | 36/82 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | 54/112 |
| 2025 | 140 | 60 | 57 | 29 | 14 | 43 | 29 | 14 | - / - |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 64/25 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 50/29 |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | 78/97 |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1998 | 1200 | 100 | 52 | 48 | 0 | 20 | 0 | 0 | 46/82 |
| 2000 | 1640 | - | 85 | 15 | 0 | 0 | 0 | 0 | 33/46 |
| 2005 | 1120 | - | 27 | 73 | 0 | 2 | 43 | 0 | 23/39 |
| 2010 | 1480 | - | 8 | 92 | 0 | 57 | 16 | 0 | 34/51 |
| 2015 | 1280 | - | 3 | 95 | 2 | 38 | 23 | 2 | 29/44 |
| 2020 | 1020 | - | 14 | 86 | 0 | 67 | 2 | 8 | 30/51 |
| 2025 | 1280 | 60 | 6 | 94 | 0 | 34 | 27 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1998 | 100 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 160 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 140 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 15/20 |
| 2010 | 160 | 60 | 75 | 25 | 0 | 0 | 0 | 0 | 16/17 |
| 2015 | 120 | - | 0 | 100 | 0 | 0 | 83 | 0 | 18/23 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 75 | 75 | 20/26 |
| 2025 | 100 | - | 0 | 100 | 0 | 20 | 0 | 0 | - / - |

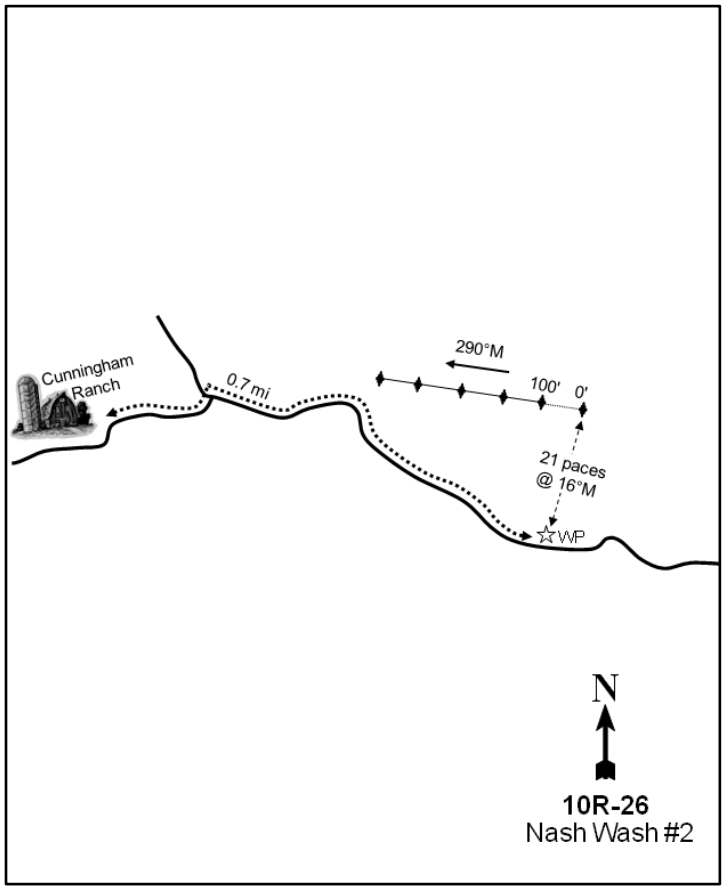
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-22.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 1 | - | 100 | - | - | - | 2.0 |
| 2025 | 1 | - | 100 | - | - | - | 3.0 |

# NASH WASH #2 - STUDY NO. 10R-26




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Calf Canyon NW; Township 20S, Range 21E, Section 15 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 622886 East 4324744 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 459 |
| Transect Bearing | 295° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of Cunningham Ranch (DWR cabin) and the main Nash Wash Road, turn toward the Cisco exit off of I-70 (south) and travel for 0.5 miles. The site is located 200 feet off of the north side of the road and the 0-foot stake is marked by browse tag #459.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | CISCO |
| Elevation | 5,268ft (1,606m) |
| Aspect | Southeast |
| Slope | 3% |
| Sample Dates | 08/25/1998, 05/26/2015, 05/26/2020, 06/04/2025 |

## Wildlife Habitat and Vegetation History

**Table 10R-26.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Pronghorn | crucial | year-long |

**Table 10R-26.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1998 | Annual Grass | No Encroachment |
| 2015 | Annual Grass/Fourwing Saltbush | No Encroachment |
| 2020 | Annual Grass | No Encroachment |
| 2025 | Fourwing Saltbush/Annual Grass | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 10R-26.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.6 | 44.7 | 32.7 | 22.6 | 1.9 | 70.4 | 608.0 | 1.8 | 08/25/1998 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Sandy loam (Fourwing Saltbush) |
| NRCS Ecological Site # | R034XY216UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1998, the plant community on this site was a stand of fourwing saltbush (*Atriplex canescens*) with a depleted herbaceous understory dominated by the introduced annual grass species cheatgrass (*Bromus tectorum*) and annual wheatgrass (*Eremopyrum triticeum*). Fourwing saltbush increased substantially in both cover and density and it was a co-dominant vegetation component in 2015, but saltbush decreased in 2020. However, saltbush cover and density increased again in 2025, and it was co-dominant with annual grasses in that year. The herbaceous understory has fluctuated in cover, but has remained dominated by annual grasses throughout the duration of the study. Annual grass cover was notably lower in 2025 than in 2020, but flushes could be possible in future sample years (Table 10R-26.10, Table 10R-26.11, Table 10R-26.12, Table 10R-26.13).

This site's condition as mule deer winter range has varied between very poor and fair since 1998; winter range condition was considered to be poor-fair in 2025. Factors that negatively influence condition as deer winter range include reduced preferred browse cover; a lack of perennial grass and forb cover; and elevated annual grass cover (Table 10R-26.6, Table 10R-26.7, Table 10R-26.15). According to pellet transect data deer presence has been moderate to high over the course of the study, while elk presence has been low. During the 2024/25 winter season the area had common occurrences of collared deer (Wildlife Migration Initiative). Between 54% and 47% of fourwing saltbush plants sampled in density strips showed signs of moderate to heavy use in 2015 and 2020, respectively. Forage kochia has had 95% and 66% of plants showing signs of moderate to heavy use in 2015 and 2020, respectively. However, a majority of plants for both species had little to no utilization in 2025 (Table 10R-26.9, Table 10R-26.13). On-site observations state that there was little to no utilization of the herbaceous community during the most recent sample year (2025).

## Trend Summary Tables

**Table 10R-26.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1998 | 3.8 | 0.1 | - | - | - | - |
| 2015 | 17.9 | 1.2 | - | 22.8 | 0.8 | - |
| 2020 | 7.2 | 2.0 | - | 8.8 | 4.3 | - |
| 2025 | 8.6 | 3.2 | - | 10.4 | 6.7 | - |

**Table 10R-26.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1998 | 462 | 6 | 183 | - | 40.7 | 0.0 | 10.2 | - |
| 2015 | 419 | 13 | 44 | - | 23.8 | 0.4 | 1.0 | - |
| 2020 | 474 | 67 | 104 | - | 63.1 | 1.2 | 3.0 | - |
| 2025 | 323 | 35 | 22 | - | 10.8 | 0.2 | 0.1 | - |

**Table 10R-26.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1998 | 15.0 | - | 40.5 | - | - | 65.0 |
| 2015 | 23.2 | 0.0 | 61.3 | 0.0 | - | 39.0 |
| 2020 | 1.2 | - | 75.2 | - | 0.0 | 69.3 |
| 2025 | 28.1 | 0.0 | 64.0 | 0.0 | 0.0 | 20.7 |

**Table 10R-26.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1998 | - | - | 11 | - | 7 |
| 2015 | 1 | - | 47 | 2 | 29 |
| 2020 | 2 | - | 9 | - | 1 |
| 2025 | 19 | - | 41 | 7 | 59 |
| Year | Days Use Per Acre (ha) | | | | |
| 1998 | - | - | 53.6 (132.4) | - | - |
| 2015 | 4.4 (10.8) | 17.4 (43.0)* | 36.2 (89.4) | 4.0 (9.9) | - |
| 2020 | - | - | 22.8 (56.3) | 2.0 (5.0) | - |
| 2025 | 39.9 (98.6) | 8.7 (21.5)* | 42.9 (105.9) | 2.0 (5.0) | - |

*Pellets per acre (ha)

**Table 10R-26.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Bromus tectorum[ai] (cheatgrass) | Eremopyrum triticeum[ai] (annual wheatgrass) | Hordeum jubatum (foxtail barley) | unknown perennial grass (unknown grass) |
|---|---|---|---|---|
| year | Nested Frequency | | | |
| 1998 | 415 | 255 | - | 6 |
| 2015 | 294 | 264 | 13 | - |
| 2020 | 435 | 257 | 67 | - |
| 2025 | 181 | 254 | 35 | - |
| year | Average Cover (%) | | | |
| 1998 | 29.9 | 10.8 | - | 0.0 |
| 2015 | 14.3 | 9.5 | 0.4 | - |
| 2020 | 47.9 | 15.2 | 1.2 | - |
| 2025 | 3.8 | 7.1 | 0.2 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-26.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Ambrosia[a] (ragweed) | Bassia scoparia[ai] (burningbush) | Chenopodium[a] (goosefoot) | Chorispora tenella[ai] (crossflower) | Descurainia pinnata[a] (western tansymustard) | Erodium cicutarium[ai] (redstem stork's bill) | Halogeton glomeratus[ai] (saltlover) | Malcolmia africana[ai] (African mustard) | Salsola tragus[ai] (prickly Russian thistle) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1998 | - | 4 | 10 | 147 | - | - | - | - | 32 |
| 2015 | 3 | 2 | - | - | 4 | 26 | 3 | 6 | 3 |
| 2020 | - | - | - | - | 5 | 11 | - | 91 | - |
| 2025 | - | - | - | - | 3 | 17 | - | 2 | - |
| year | Average Cover (%) | | | | | | | | |
| 1998 | - | 0.3 | 0.5 | 8.3 | - | - | - | - | 1.1 |
| 2015 | 0.0 | 0.0 | - | - | 0.0 | 0.8 | 0.0 | 0.1 | 0.2 |
| 2020 | - | - | - | - | 0.0 | 0.6 | - | 2.4 | - |
| 2025 | - | - | - | - | 0.0 | 0.1 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-26.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Atriplex canescens[p] (fourwing saltbush) | Atriplex confertifolia[p] (shadscale saltbush) | Bassia prostrata[pi] (forage kochia) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Sarcobatus vermiculatus (greasewood) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 1998 | - | - | - | - | - |
| 2015 | 22.2 | 0.3 | 0.3 | - | 0.8 |
| 2020 | 8.7 | - | 0.1 | - | 4.3 |
| 2025 | 10.1 | - | 0.3 | - | 6.7 |
| year | Quadrat Cover (%) | | | | |
| 1998 | 3.8 | - | - | 0.1 | - |
| 2015 | 17.6 | 0.0 | 0.3 | - | 1.2 |
| 2020 | 6.9 | 0.0 | 0.3 | - | 2.0 |
| 2025 | 8.2 | - | 0.4 | - | 3.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-26.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

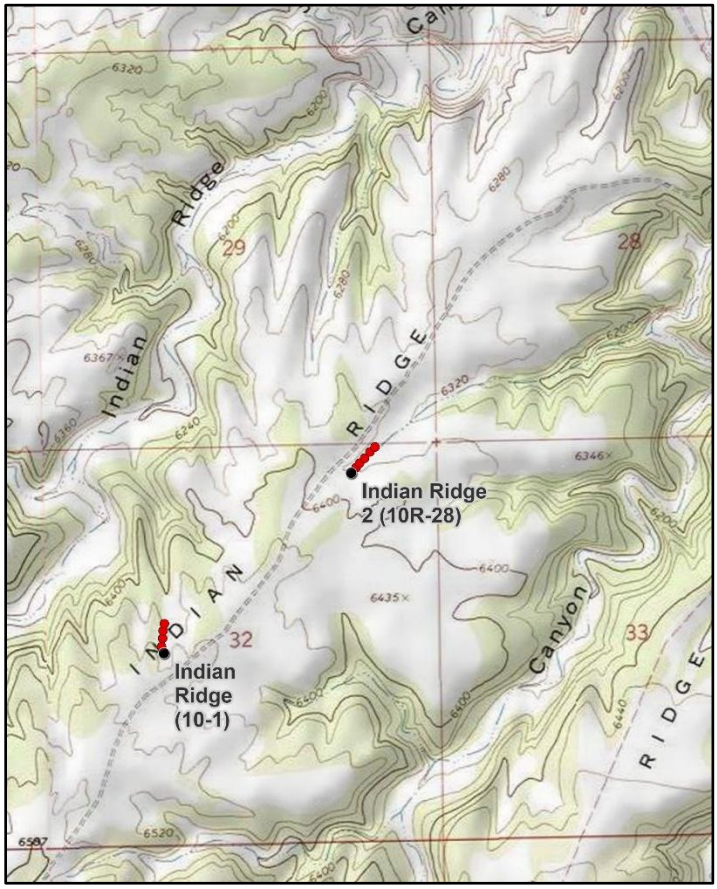
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1998 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | 78/153 |
| 2015 | 3420 | 280 | 27 | 70 | 4 | 35 | 19 | 11 | 81/117 |
| 2020 | 1960 | - | 8 | 25 | 67 | 22 | 25 | 85 | 73/93 |
| 2025 | 2060 | 80 | 15 | 79 | 7 | 15 | 2 | 7 | - / - |
| Atriplex confertifolia[p] -- (shadscale saltbush) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 31/67 |
| 2020 | - | - | - | - | - | - | - | - | 20/16 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Bassia prostrata[pi] -- (forage kochia) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 380 | 820 | 21 | 79 | 0 | 37 | 58 | 0 | 24/34 |
| 2020 | 240 | - | 8 | 92 | 0 | 33 | 33 | 0 | 24/41 |
| 2025 | 660 | - | 39 | 61 | 0 | 18 | 0 | 0 | - / - |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1998 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 500 | 20 | 16 | 84 | 0 | 60 | 28 | 12 | 90/110 |
| 2020 | 800 | - | 5 | 75 | 20 | 48 | 8 | 25 | 82/118 |
| 2025 | 900 | - | 20 | 80 | 0 | 4 | 0 | 0 | - / - |

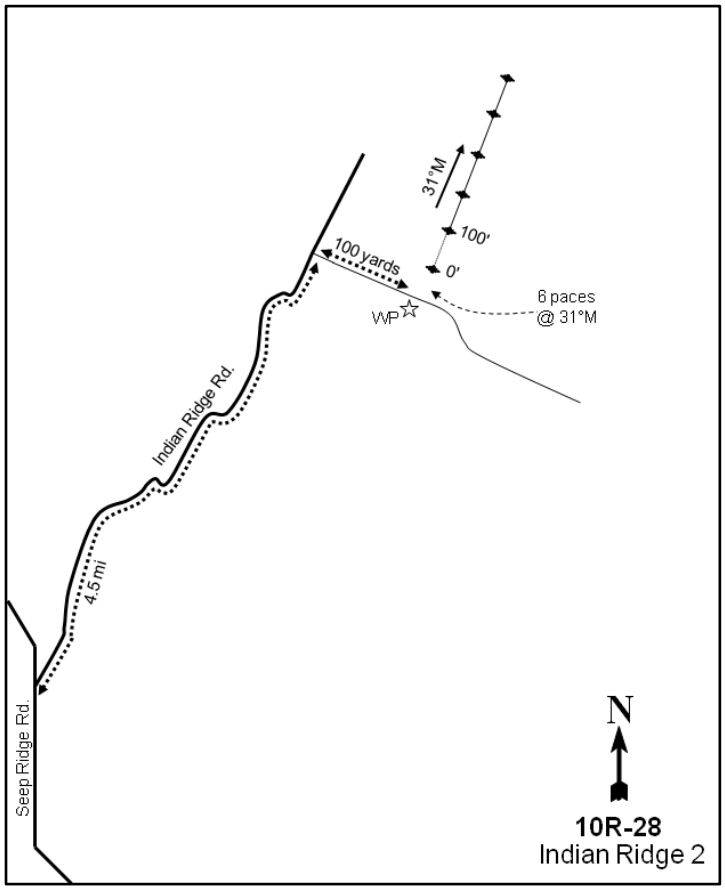
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-26.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1998 | 4.7 | 0.0 | 0.0 | 0.1 | -20.0 | 0.0 | 0.0 | **-15.2** | Very Poor |
| 2015 | 28.5 | 14.0 | 13.2 | 0.7 | -17.9 | 0.0 | 0.0 | **38.5** | Fair |
| 2020 | 11.0 | 3.3 | 4.1 | 2.3 | -20.0 | 0.0 | 0.0 | **0.7** | Very Poor |
| 2025 | 13.1 | 13.0 | 7.7 | 0.5 | -8.1 | 0.0 | 0.0 | **26.2** | Poor-Fair |

# INDIAN RIDGE 2 - STUDY NO. 10R-28




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Cooper Canyon SW; Township 13S, Range 23E, Section 32 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 640612 East 4390112 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 402 |
| Transect Bearing | 31° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard; Line 2: 75 ft Long |

## Directions to Site

From the intersection of Seep Ridge Road and Indian Ridge Road, follow Indian Ridge Road 4.5 miles to where a road breaks off to the right. Take this road for 100 yards to a witness post on the left (north) side of the road. From the witness post walk 6 paces to the 0-foot stake at 31 degrees magnetic. The 0-foot stake is marked with browse tag #402.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SUNDAY SCHOOL CANYON |
| Elevation | 6,383ft (1,946m) |
| Aspect | Northeast |
| Slope | 6% |
| Sample Dates | 06/30/1999, 08/03/2011, 06/03/2015, 06/01/2020, 06/09/2025 |

**Table 10R-28.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Seep Ridge Maintenance Lop and Scatter | 5517 | September-October 2021 | 3813 |
| Hand Crew - Lop and Scatter | Indian Ridge Lop and Scatter | 1079 | June 2009 | 1001 |
| Fire - Wildfire | - | - | Historic | - |
| Herbicide - Imazapic | Indian Ridge Sagebrush | 1952 | October 2011 | 224 |
| Seeding - Rangeland Drill | Indian Ridge Sagebrush | 1952 | September 2011 | 224 |

**Table 10R-28.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Indian Ridge Sagebrush | | | Drill | Sep 2011 | 218 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Emery UT | 1.15 | 0.95 |
| G | Agropyron cristatum | Crested Wheatgrass | Nordan | 1.38 | 1.16 |
| G | Elymus elymoides | Bottlebrush Squirreltail | Millard UT | 0.46 | 0.36 |
| G | Elymus lanceolatus | Thickspike Wheatgrass | Critana | 1.15 | 1.06 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Secar | 0.92 | 0.73 |
| G | Poa secunda | Sandberg Bluegrass | UP/Colorado Plateau | 0.23 | 0.21 |
| G | Poa secunda | Canby Bluegrass | Canbar | 0.23 | 0.11 |
| G | Psathyrostachys juncea | Russian Wildrye | | 0.92 | 0.72 |
| G | Pseudoroegneria spicata | Bluebunch Wheatgrass | Anatone | 1.15 | 1.04 |
| F | Linum perenne | Blue Flax | Appar | 0.46 | 0.34 |
| F | Medicago sativa | Alfalfa | Ranger | 0.69 | 0.62 |
| F | Medicago sativa | Alfalfa | Nomad | 0.92 | 0.82 |
| S | Atriplex canescens | Fourwing Saltbush | Emery/Grand UT | 1.15 | 0.26 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Indian Ridge Sagebrush - Fluffy Mix | | | Drill | Sep 2011 | 218 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Sevier UT | 1.15 | 0.24 |
| S | Bassia prostrata | Forage Kochia | Beaver UT | 1.15 | 0.54 |
| S | Krascheninnikovia lanata | Winterfat | | 0.18 | 0.04 |

## Wildlife Habitat and Vegetation History

**Table 10R-28.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Pronghorn | substantial | year-long |

**Table 10R-28.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1999 | Annual Grass/Fourwing Saltbush | No Encroachment |
| 2011 | Annual-Perennial Grass/Fourwing Saltbush | No Encroachment |
| 2015 | Annual Grass/Fourwing Saltbush | No Encroachment |
| 2020 | Annual Grass/Fourwing Saltbush | No Encroachment |
| 2025 | Perennial Grass/Fourwing Saltbush | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 10R-28.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.9 | 34.9 | 36.6 | 28.6 | 2.7 | 12.0 | 256.0 | 0.6 | 06/30/1999 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Upland Silt Loam (Fourwing Saltbush-Winterfat) |
| NRCS Ecological Site # | R034BY329UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1999, the plant community on this site was a mixed stand of fourwing saltbush (*Atriplex canescens*) and winterfat (*Krascheninnikovia lanata*) with a depleted herbaceous understory dominated by the introduced annual grass species cheatgrass (*Bromus tectorum*) and the native perennial grass species western wheatgrass (*Pascopyrum smithii*). Fourwing saltbush and winterfat decreased in cover between 2011 and 2020 while the herbaceous understory remained dominated by cheatgrass with a lesser component of western wheatgrass. However, cheatgrass cover decreased in 2025 while that of native perennial grasses increased. Fourwing saltbush cover also increased in 2025, and it was co-dominant with perennial grasses during the most recent sample year. However, decadence within the fourwing saltbush population has also increased overall (Table 10R-28.10, Table 10R-28.12, Table 10R-28.13). Although cover and frequency of cheatgrass were low in 2025, there may be a threat to the ecological resilience of the plant community if cheatgrass increases again in the future.

Condition of mule deer winter range on this site has varied between poor and good since 1995; winter range condition was considered to be fair in 2025. Negative factors contributing to this fair condition include low cover and a lack of recruitment of young within the preferred browse community; the presence of annual grass; and a lack of perennial forb cover (Table 10R-28.6, Table 10R-28.7, Table 10R-28.13, Table 10R-28.15). Pellet transect data indicates that deer and elk presence has been low in all sample years since 2011. During the 2024/25 winter season the area had infrequent occurrences of nearby collared mule deer (Wildlife Migration Initiative). Cattle and/or bison had high presence in 2020, and horse presence has been low to moderate (Table 10R-28.9). It was estimated that 70% of fourwing saltbush plants showed signs of moderate to heavy use between 2015 and 2020. It is reasonable to assume that sustained moderate-heavy utilization by deer in combination with other factors (climatic, etc.) has contributed to the overall increasing decadence within the saltbush population (Table 10R-28.9, Table 10R-28.13). On-site observations for 2025 note that little to no utilization was evident on herbaceous species, and shrubs appeared to be affected by drought.

## Trend Summary Tables

**Table 10R-28.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1999 | 9.5 | 0.3 | - | - | - | - |
| 2011 | 17.8 | 0.0 | - | 23.4 | 0.3 | - |
| 2015 | 7.8 | 0.2 | - | 7.8 | 0.1 | - |
| 2020 | 8.3 | 0.1 | - | 7.1 | - | - |
| 2025 | 14.1 | 1.1 | - | 12.2 | 0.7 | - |

**Table 10R-28.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1999 | 387 | 235 | 7 | 55 | 24.5 | 10.7 | 0.0 | 0.6 |
| 2011 | 364 | 397 | 25 | 74 | 25.1 | 37.4 | 0.4 | 3.9 |
| 2015 | 422 | 352 | 70 | 45 | 33.3 | 23.1 | 0.5 | 0.8 |
| 2020 | 415 | 279 | 187 | 51 | 18.7 | 11.9 | 2.5 | 1.4 |
| 2025 | 180 | 359 | 223 | 72 | 2.5 | 26.3 | 1.9 | 0.7 |

**Table 10R-28.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1999 | 9.1 | 0.0 | 63.4 | 1.4 | 0.0 | 48.3 |
| 2011 | 21.8 | 0.2 | 37.7 | 3.9 | 0.1 | 65.2 |
| 2015 | 20.1 | 0.2 | 44.0 | 1.6 | 0.1 | 60.5 |
| 2020 | 11.6 | 0.1 | 68.5 | 2.0 | 0.3 | 40.1 |
| 2025 | 24.6 | 0.0 | 43.2 | 2.3 | 0.3 | 42.9 |

**Table 10R-28.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1999 | 9 | 2 | 13 | - | 4 |
| 2011 | 6 | 12 | - | - | 3 |
| 2015 | 4 | 7 | 2 | 10 | 15 |
| 2020 | 21 | 15 | 4 | 5 | 18 |
| 2025 | 3 | 25 | 14 | 3 | 9 |
| Year | Days Use Per Acre (ha) | | | | |
| 1999 | - | - | - | - | - |
| 2011 | 23.2 (57.4) | 10.7 (26.5) | 3.4 (8.3) | - | - |
| 2015 | 17.4 (43.0) | 8.7 (21.5) | 2.0 (5.0) | 10.4 (25.8) | - |
| 2020 | 40.6 (100.4) | 15.4 (38.1) | 1.3 (3.3) | 15.1 (37.3) | - |
| 2025 | 1.5 (3.6) | 19.4 (48.0) | 13.4 (33.1) | 4.7 (11.5) | - |

**Table 10R-28.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Koeleria macrantha (prairie Junegrass) | Pascopyrum smithii (western wheatgrass) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Sporobolus cryptandrus (sand dropseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1999 | - | - | 11 | 387 | - | - | 201 | 4 | - | 5 | - | 21 |
| 2011 | 1 | - | 46 | 364 | - | 10 | 254 | - | - | 6 | - | 173 |
| 2015 | - | 20 | 57 | 422 | - | 1 | 291 | 6 | 9 | 19 | - | 49 |
| 2020 | 3 | 2 | 43 | 415 | - | 6 | 209 | - | - | 27 | 5 | 80 |
| 2025 | - | - | 37 | 180 | 3 | - | 250 | - | - | 12 | 1 | 157 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1999 | - | - | 0.1 | 24.5 | - | - | 10.3 | 0.0 | - | 0.0 | - | 0.3 |
| 2011 | 0.0 | - | 3.4 | 25.1 | - | 0.7 | 20.0 | - | - | 0.0 | - | 13.2 |
| 2015 | - | 0.7 | 2.0 | 33.3 | - | 0.0 | 18.4 | 0.2 | 0.1 | 0.7 | - | 1.1 |
| 2020 | 0.0 | 0.0 | 1.4 | 18.7 | - | 0.1 | 8.1 | - | - | 0.6 | 0.0 | 1.7 |
| 2025 | - | - | 2.3 | 2.5 | 0.1 | - | 17.7 | - | - | 0.1 | 0.0 | 6.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-28.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Bassia scoparia[ai] (burningbush) | Camelina microcarpa[ai] (littlepod false flax) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Machaeranthera canescens (hoary tansyaster) | Orobanche fasciculata (clustered broomrape) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1999 | - | - | - | - | - | 7 | - | 3 | - | - | - | - | - | 55 | - | - |
| 2011 | - | 7 | - | - | 10 | 9 | - | - | 1 | - | - | - | - | 74 | - | - |
| 2015 | 15 | - | - | - | - | 22 | - | - | 38 | - | - | 2 | 1 | 42 | 1 | 2 |
| 2020 | 49 | - | 4 | 41 | 9 | 3 | - | 1 | 88 | 5 | 4 | - | 28 | 44 | 3 | 17 |
| 2025 | 97 | - | 9 | 125 | 2 | 17 | 8 | - | 46 | - | 7 | - | 1 | 68 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1999 | - | - | - | - | - | 0.0 | - | 0.0 | - | - | - | - | - | 0.6 | - | - |
| 2011 | - | 0.1 | - | - | 0.2 | 0.1 | - | - | 0.0 | - | - | - | - | 3.9 | - | - |
| 2015 | 0.1 | - | - | - | - | 0.0 | - | - | 0.4 | - | - | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| 2020 | 0.6 | - | 0.0 | 0.3 | 0.0 | 0.0 | - | 0.0 | 1.1 | 0.0 | 0.3 | - | 0.1 | 1.1 | 0.0 | 0.2 |
| 2025 | 0.9 | - | 0.1 | 0.6 | 0.0 | 0.0 | 0.0 | - | 0.3 | - | 0.0 | - | 0.0 | 0.6 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-28.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia polyacantha (plains pricklypear) | Picrothamnus desertorum (bud sagebrush) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1999 | - | - | - | - | - | - | - |
| 2011 | 0.5 | - | 12.7 | 0.3 | 10.2 | - | - |
| 2015 | 1.2 | - | 4.4 | 0.1 | 2.2 | - | - |
| 2020 | 1 | - | 5.2 | - | 0.9 | - | - |
| 2025 | 0.4 | - | 9.1 | 0.3 | 2.7 | 0.4 | - |
| year | Quadrat Cover (%) | | | | | | |
| 1999 | - | 0.1 | 6.6 | 0.2 | 2.8 | 0.0 | 0.1 |
| 2011 | 1.0 | - | 7.2 | 0.0 | 9.6 | - | - |
| 2015 | 1.0 | - | 4.6 | 0.0 | 2.1 | 0.1 | - |
| 2020 | 0.4 | - | 6.3 | 0.1 | 1.6 | - | - |
| 2025 | 0.7 | - | 9.8 | 0.5 | 3.5 | 0.6 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-28.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

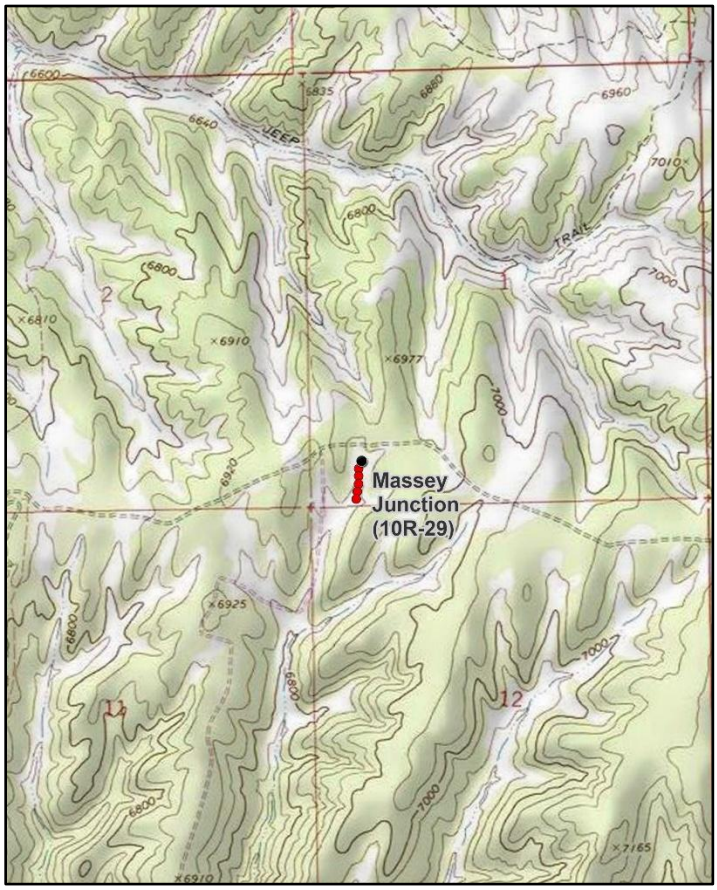
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1999 | - | - | - | - | - | - | - | - | -/- |
| 2011 | 540 | 40 | 11 | 89 | 0 | 0 | 0 | 0 | 44/39 |
| 2015 | 3560 | 2380 | 21 | 79 | 0 | 0 | 0 | 0 | 22/21 |
| 2020 | 1620 | - | 19 | 82 | 0 | 12 | 0 | 3 | 11/17 |
| 2025 | 1300 | 820 | 20 | 75 | 5 | 0 | 0 | 5 | - / - |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1999 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 35/72 |
| 2011 | - | - | - | - | - | - | - | - | 28/46 |
| 2015 | - | - | - | - | - | - | - | - | 27/67 |
| 2020 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | 22/64 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1999 | 1240 | - | 27 | 68 | 5 | 40 | 11 | 3 | 79/115 |
| 2011 | 1120 | 40 | 27 | 70 | 4 | 7 | 0 | 0 | 83/113 |
| 2015 | 1320 | 40 | 26 | 56 | 18 | 21 | 49 | 12 | 52/75 |
| 2020 | 1240 | 20 | 23 | 37 | 40 | 32 | 40 | 52 | 75/99 |
| 2025 | 1660 | - | 17 | 49 | 34 | 36 | 6 | 34 | - / - |
| Cercocarpus ledifolius[p] -- (curl-leaf mountain mahogany) | | | | | | | | | |
| 1999 | - | - | - | - | - | - | - | - | -/- |
| 2011 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 26/26 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1999 | 460 | - | 0 | 100 | 0 | 0 | 0 | 4 | 18/23 |
| 2011 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/34 |
| 2015 | 240 | - | 17 | 83 | 0 | 0 | 0 | 0 | 14/15 |
| 2020 | 520 | 20 | 81 | 19 | 0 | 0 | 4 | 0 | 8/11 |
| 2025 | 820 | 100 | 2 | 93 | 5 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1999 | 10260 | - | 9 | 90 | 1 | 36 | 20 | 1 | 23/21 |
| 2011 | 7400 | - | 15 | 85 | 0 | 1 | 1 | 0 | 45/46 |
| 2015 | 5580 | - | 20 | 80 | 1 | 23 | 12 | 2 | 24/26 |
| 2020 | 4120 | 40 | 14 | 85 | 1 | 25 | 22 | 1 | 17/20 |
| 2025 | 6060 | 20 | 20 | 80 | 1 | 20 | 0 | 1 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1999 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/7 |
| 2011 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/27 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/20 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Picrothamnus desertorum -- (bud sagebrush) | | | | | | | | | |
| 1999 | 660 | - | 0 | 82 | 18 | 36 | 55 | 18 | 11/12 |

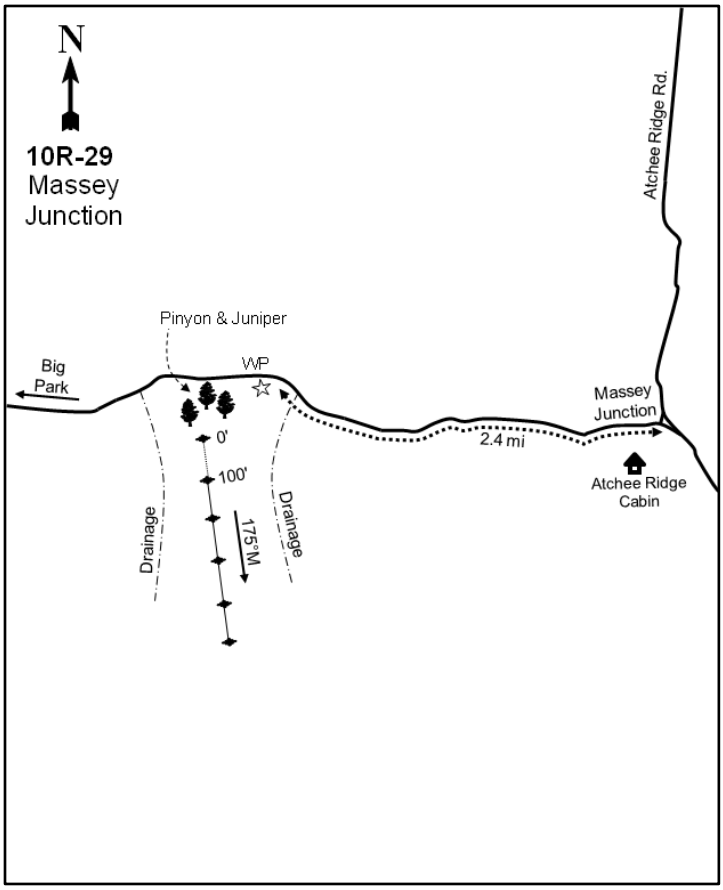
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-28.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1999 | 11.9 | 13.9 | 10.9 | 21.5 | -18.4 | 1.2 | 0.0 | **41.0** | Poor |
| 2011 | 29.1 | 14.4 | 10.6 | 30.0 | -18.8 | 7.8 | 0.0 | **73.1** | Good |
| 2015 | 9.5 | 11.9 | 11.7 | 30.0 | -20.0 | 1.5 | 0.0 | **44.6** | Poor |
| 2020 | 8.6 | 6.1 | 10.5 | 23.9 | -14.0 | 2.9 | 0.0 | **38.0** | Poor |
| 2025 | 15.2 | 7.3 | 8.8 | 30.0 | -1.9 | 1.3 | 0.0 | **60.7** | Fair |

# MASSEY JUNCTION - STUDY NO. 10R-29




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Burnt Timber Canyon ; Township 13S, Range 24E, Section 01 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 655510 East 4397165 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 403 |
| Transect Bearing | 175° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From Seep Ridge Road about 10 miles north of Pine Spring, turn onto Bitter Creek Road near McCoy Reservoir. Drive easterly on this road for 10.9 miles to where the road tops out and turn right off of the main road. Go 7.7 miles, staying on the main road, to a fork. Turn right (east) and drive 0.2 miles to another fork. Proceed to the left and drive 1.0 miles to the witness post on the right (south) side of the road. From the witness post, the 0-foot stake is located down the canyon near the tip of the pinyon-juniper island separating the two drainages. The baseline continues down the draw.

Alternate Route: From Massey Junction off of Atchee Ridge Road, follow the road east towards Big Park 2.4 miles to a witness post on the left (south) side of the road. From the witness post, the 0-foot stake is located down the canyon near the tip of the pinyon-juniper island separating the two drainages. The baseline continues down the draw.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | ATCHEE RIDGE AMP |
| Elevation | 6,960ft (2,121m) |
| spect | South |
| Slope | 3-5% |
| Sample Dates | 05/30/1999, 06/08/2005, 06/09/2010, 06/03/2015, 06/03/2020, 06/09/2025 |

**Table 10R-29.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Hand Planter | Atchee Ridge Burn Reseeding 1955 | LTDL 379-1009 | October 1955-May 1956 | 100 |
| Fire - Wildfire | - | - | 1980s | - |

**Table 10R-29.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| | | | Hand Seeding | Oct 1955 | 100 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | | 10.00 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 10R-29.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 10R-29.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1999 | Perennial Grass/Fourwing Saltbush | Early Phase I |
| 2005 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2010 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2015 | Annual Grass/Fourwing Saltbush | Early Phase I |
| 2020 | Fourwing Saltbush/Perennial Grass | Early Phase I |
| 2025 | Perennial-Annual Grass/Fourwing Saltbush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 10R-29.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.5 | 28.9 | 34.6 | 36.6 | 5.4 | 17.1 | 336.0 | 0.8 | 05/30/1999 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Upland Silt Loam (Fourwing Saltbush-Winterfat) |
| NRCS Ecological Site # | R034BY329UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1999, the plant community on this site was dominated by the perennial grass species western wheatgrass (*Pascopyrum smithii*) with fourwing saltbush (*Atriplex canescens*) contributing the most browse cover. However, the herbaceous component transitioned to one dominated by the introduced annual grass species cheatgrass (*Bromus tectorum*); fourwing saltbush exhibited a decrease. Fourwing saltbush had started to recover by the 2015 sample year and it was again a dominant vegetation component along with perennial grasses in 2020 as cover of cheatgrass decreased. However, cheatgrass cover increased in 2025, and it was again a co-dominant component during the most recent sample year (Table 10R-29.10, Table 10R-12).

This site's condition as mule deer winter range has varied between very poor and good since 1999; winter range condition was considered to be good in 2025. Factors that negatively influence condition as deer winter range include reduced perennial forb cover and the presence of annual grass (Table 10R-29.7, Table 10R-29.15). According to pellet transect data deer presence has ranged between low and high with an increasing trend over the course of the study, while elk presence has ranged from moderate to high. During the 2024/25 winter season the area had common occurrences of collared mule deer (Wildlife Migration Initiative). Horse presence was first detected in 2025 (Table 10R-29.9). Over 70% of sagebrush plants sampled in density strips have shown signs of moderate to heavy use in most sample years. On-site observations state that there was light utilization (10-20%) on western wheatgrass during the most recent sample year (2025). However, the perennial forb and preferred browse communities appeared to be adversely affected by drought as evidenced by stunted growth and restricted flowering (Photos, Table 10R-29.11, Table 10R-29.12, Table 10R-29.13). Prolonged exposure to heavy utilization in combination with drought could reduce the long term utility of the site for wildlife.

## Trend Summary Tables

**Table 10R-29.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1999 | 14.9 | - | - | - | - | - |
| 2005 | 7.4 | 0.2 | - | 8.3 | 0.2 | - |
| 2010 | 5.9 | 0.2 | - | 8.6 | 0.2 | - |
| 2015 | 10.8 | 0.8 | - | 12.7 | 0.5 | - |
| 2020 | 20.8 | 0.5 | - | 21.7 | 0.2 | - |
| 2025 | 24.6 | 0.4 | - | 35.6 | 0.4 | - |

**Table 10R-29.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1999 | 335 | 432 | 12 | 85 | 7.2 | 27.0 | 0.0 | 1.0 |
| 2005 | 425 | 140 | 288 | 133 | 28.9 | 2.4 | 10.6 | 2.6 |
| 2010 | 330 | 212 | 224 | 239 | 10.8 | 4.9 | 3.1 | 5.3 |
| 2015 | 412 | 361 | 79 | 212 | 22.7 | 12.1 | 1.1 | 3.3 |
| 2020 | 247 | 253 | 224 | 211 | 3.6 | 6.4 | 3.6 | 6.2 |
| 2025 | 297 | 342 | 193 | 87 | 14.5 | 21.0 | 2.6 | 1.0 |

**Table 10R-29.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1999 | 12.9 | 0.0 | 49.6 | 3.8 | 0.1 | 52.5 |
| 2005 | 28.3 | 0.3 | 28.6 | 3.0 | 0.2 | 50.2 |
| 2010 | 32.5 | 0.0 | 43.7 | 2.2 | - | 32.6 |
| 2015 | 20.8 | 0.0 | 41.7 | 2.0 | 0.0 | 53.7 |
| 2020 | 27.2 | 0.0 | 47.4 | 7.9 | 0.2 | 39.3 |
| 2025 | 21.8 | 0.0 | 40.9 | 5.9 | 0.2 | 52.7 |

**Table 10R-29.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1999 | 6 | 19 | 25 | - | 16 |
| 2005 | 6 | 24 | 38 | - | 63 |
| 2010 | 20 | 22 | 17 | - | 4 |
| 2015 | 6 | 22 | 21 | - | 8 |
| 2020 | 14 | 37 | 18 | - | 17 |
| 2025 | 1 | 20 | 21 | 3 | 7 |
| Year | Days Use Per Acre (ha) | | | | |
| 1999 | - | - | - | - | - |
| 2005 | 16.0 (39.5) | 12.1 (29.8) | 42.2 (104.3) | - | - |
| 2010 | 36.3 (89.7) | 28.8 (71.2) | 30.2 (74.5) | - | - |
| 2015 | 16.7 (41.2) | 29.5 (72.8) | 28.1 (69.5) | - | - |
| 2020 | 8.0 (19.7) | 73.7 (182.1) | 23.4 (57.9) | - | - |
| 2025 | 2.2 (5.4) | 53.0 (130.8) | 49.6 (122.5) | 2.3 (5.7) | - |

**Table 10R-29.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Pascopyrum smithii (western wheatgrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1999 | 15 | 335 | 1 | 428 | - |
| 2005 | 27 | 425 | - | 125 | 20 |
| 2010 | 29 | 330 | - | 203 | 26 |
| 2015 | 11 | 412 | - | 356 | 11 |
| 2020 | 38 | 247 | 12 | 240 | 30 |
| 2025 | 14 | 297 | 8 | 333 | 27 |
| year | Average Cover (%) | | | | |
| 1999 | 0.4 | 7.2 | 0.0 | 26.6 | - |
| 2005 | 0.4 | 28.9 | - | 1.5 | 0.4 |
| 2010 | 0.4 | 10.8 | - | 4.3 | 0.1 |
| 2015 | 0.2 | 22.7 | - | 11.9 | 0.0 |
| 2020 | 0.5 | 3.6 | 0.0 | 5.6 | 0.3 |
| 2025 | 0.7 | 14.5 | 0.3 | 19.8 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-29.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Camelina microcarpa[ai] (littlepod false flax) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chorispora tenella[ai] (crossflower) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Lappula occidentalis[a] (flatspine stickseed) | Medicago sativa[i] (alfalfa) | Phlox longifolia (longleaf phlox) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1999 | - | - | - | - | - | 12 | - | - | - | - | - | 85 | - | - |
| 2005 | - | 7 | - | 3 | 2 | 92 | - | 263 | - | - | 3 | 133 | 3 | 1 |
| 2010 | - | 5 | - | 3 | - | 40 | - | 212 | - | 2 | 8 | 234 | 14 | 0 |
| 2015 | - | 7 | - | 1 | - | 7 | 2 | 17 | 5 | 1 | 48 | 197 | 29 | 4 |
| 2020 | - | 30 | - | 3 | 5 | 12 | - | 203 | - | 15 | 18 | 181 | 57 | 12 |
| 2025 | 105 | 38 | 42 | - | 23 | 47 | - | 3 | - | 15 | 6 | 72 | 4 | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1999 | - | - | - | - | - | 0.0 | - | - | - | - | - | 1.0 | - | - |
| 2005 | - | 0.1 | - | 0.0 | 0.1 | 3.1 | - | 7.1 | - | - | 0.2 | 2.6 | 0.0 | 0.0 |
| 2010 | - | 0.0 | - | 0.0 | - | 0.3 | - | 2.7 | - | 0.0 | 0.2 | 5.0 | 0.3 | 0.0 |
| 2015 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.9 | 2.8 | 0.5 | 0.0 |
| 2020 | - | 0.1 | - | 0.0 | 0.0 | 0.0 | - | 3.1 | - | 0.0 | 0.2 | 5.0 | 1.2 | 0.1 |
| 2025 | 1.4 | 0.2 | 0.1 | - | 0.4 | 0.5 | - | 0.0 | - | 0.1 | 0.0 | 0.8 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-29.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. tridentata[p] (basin big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Cercocarpus ledifolius[p] (curl-leaf mountain mahogany) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1999 | - | - | - | - | - | - | - |
| 2005 | 1.1 | - | 3.1 | - | - | 0.2 | 4.1 |
| 2010 | 0.2 | 0.4 | 7.2 | - | - | 0.2 | 0.8 |
| 2015 | 8 | - | 2.8 | - | - | 0.5 | 1.9 |
| 2020 | 7 | - | 13.2 | - | - | 0.2 | 1.5 |
| 2025 | 5.5 | - | 26.7 | - | 0.1 | 0.3 | 3.4 |
| year | Quadrat Cover (%) | | | | | | |
| 1999 | 2.0 | - | 8.9 | - | - | - | 4.0 |
| 2005 | 0.3 | - | 2.4 | - | - | 0.2 | 4.7 |
| 2010 | 0.7 | 0.0 | 3.9 | - | - | 0.2 | 1.4 |
| 2015 | 7.6 | - | 2.0 | 0.0 | 0.2 | 0.6 | 1.2 |
| 2020 | 8.4 | 0.1 | 9.9 | - | 0.1 | 0.3 | 2.4 |
| 2025 | 8.0 | 0.2 | 12.1 | 0.4 | 0.4 | 0.0 | 4.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-29.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1999 | 7000 | 20 | 4 | 96 | 0 | 24 | 13 | 0 | 16/18 |
| 2005 | 2420 | 140 | 6 | 94 | 0 | 29 | 18 | 0 | 19/22 |
| 2010 | 1960 | 380 | 55 | 45 | 0 | 21 | 3 | 6 | 13/20 |
| 2015 | 23080 | 2180 | 29 | 71 | 0 | 11 | 0 | 3 | 13/17 |
| 2020 | 14840 | 1880 | 51 | 49 | 0 | 4 | 0 | 0 | 15/20 |
| 2025 | 15200 | 80 | 26 | 74 | 0 | 4 | 3 | 0 | - / - |
| Artemisia tridentata ssp. tridentata[p] -- (basin big sagebrush) | | | | | | | | | |
| 1999 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 87/80 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 73/78 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 89/99 |
| 2015 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 63/82 |
| 2020 | 60 | - | 33 | 67 | 0 | 0 | 67 | 0 | 81/89 |
| 2025 | 100 | - | 60 | 40 | 0 | 0 | 60 | 0 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1999 | 2100 | - | 7 | 71 | 22 | 43 | 29 | 7 | 83/105 |
| 2005 | 2320 | 40 | 9 | 28 | 63 | 31 | 57 | 28 | 69/84 |
| 2010 | 2060 | 520 | 15 | 74 | 12 | 38 | 28 | 11 | 65/84 |
| 2015 | 2000 | 100 | 5 | 8 | 87 | 14 | 56 | 92 | 58/71 |
| 2020 | 2460 | 120 | 20 | 75 | 5 | 46 | 39 | 7 | 66/80 |
| 2025 | 3660 | 60 | 12 | 74 | 14 | 31 | 30 | 15 | - / - |

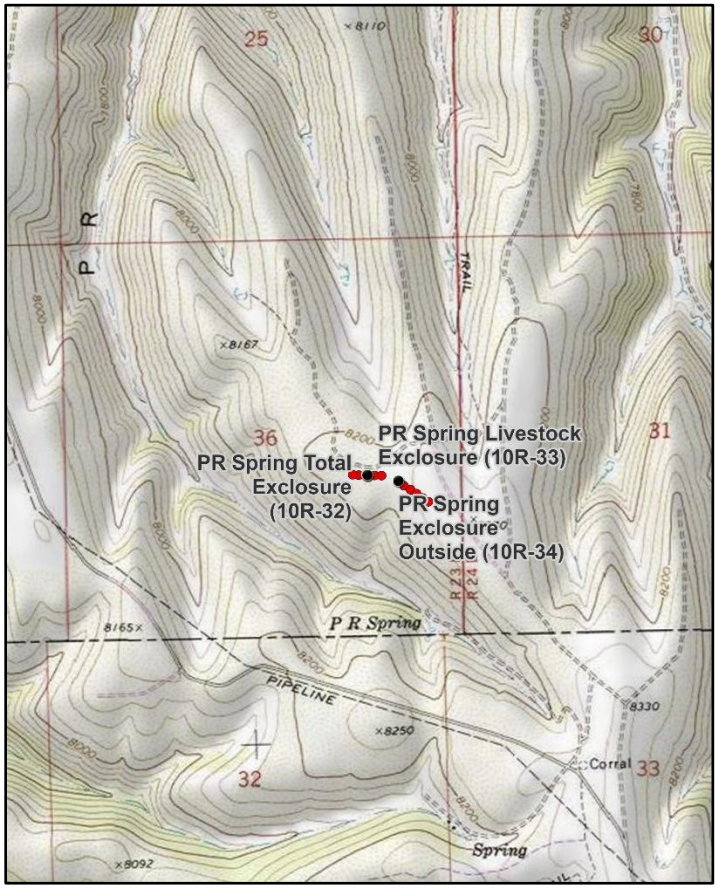
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1999 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/14 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1999 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 30/38 |
| 2010 | - | - | - | - | - | - | - | - | 94/147 |
| 2015 | 380 | - | 90 | 11 | 0 | 42 | 21 | 5 | 51/71 |
| 2020 | 60 | - | 67 | 33 | 0 | 67 | 0 | 0 | 55/74 |
| 2025 | 60 | - | 67 | 33 | 0 | 0 | 33 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1999 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 16/15 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/20 |
| 2010 | 740 | - | 16 | 84 | 0 | 0 | 0 | 0 | 11/13 |
| 2015 | 1860 | - | 69 | 31 | 0 | 0 | 0 | 0 | 14/12 |
| 2020 | 1300 | 20 | 59 | 42 | 0 | 0 | 0 | 0 | 15/22 |
| 2025 | 600 | - | 17 | 80 | 3 | 0 | 0 | 3 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1999 | 10780 | - | 7 | 93 | 0 | 7 | 3 | 0 | 25/21 |
| 2005 | 11640 | 40 | 8 | 92 | 0 | 5 | 88 | 0 | 19/21 |
| 2010 | 5600 | 140 | 49 | 51 | 0 | 29 | 57 | 0 | 12/15 |
| 2015 | 5380 | 60 | 14 | 84 | 2 | 66 | 26 | 8 | 15/16 |
| 2020 | 4880 | 20 | 32 | 68 | 0 | 15 | 46 | 14 | 17/18 |
| 2025 | 5380 | 60 | 13 | 87 | 0 | 44 | 21 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1999 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 86/120 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 119/121 |

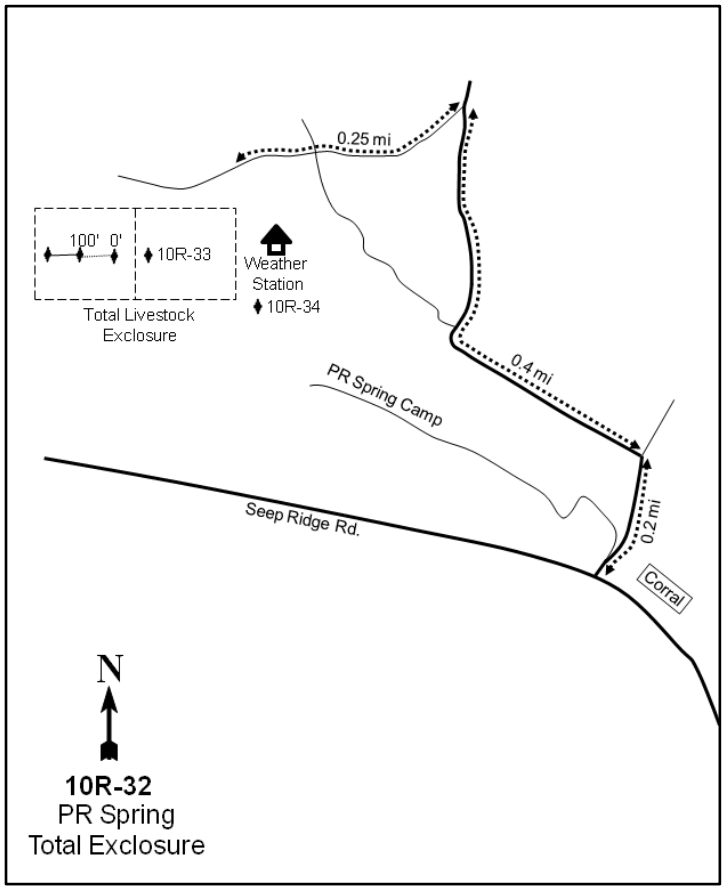
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-29.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1999 | 18.1 | 11.0 | 3.1 | 30.0 | -5.4 | 2.0 | 0.0 | **58.8** | Fair |
| 2005 | 10.1 | 8.0 | 3.9 | 4.7 | -20.0 | 5.2 | 0.0 | **11.9** | Very Poor |
| 2010 | 10.7 | 12.0 | 9.0 | 9.7 | -8.1 | 10.0 | 0.0 | **43.3** | Poor |
| 2015 | 13.9 | 9.2 | 10.7 | 24.3 | -17.0 | 6.5 | 0.0 | **47.6** | Poor |
| 2020 | 25.4 | 14.0 | 15.0 | 12.9 | -2.7 | 10.0 | 0.0 | **74.6** | Good |
| 2025 | 30.0 | 11.8 | 7.1 | 30.0 | -10.9 | 2.0 | 0.0 | **70.0** | Good |

# PR SPRING TOTAL EXCLOSURE - STUDY NO. 10R-32




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | P R Spring NE; Township 15S, Range 23E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 647370 East 4370119 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 435 |
| Transect Bearing | 260° magnetic |
| Length | 200ft |
| Belt Placement | Line 1 (34ft, 59ft, & 95ft), Line 2 (11ft & 71ft) |
| Belt Marker Placement | Standard; Line 2: 86ft Long |

## Directions to Site

From Seep Ridge Road, travel to the PR Spring turnoff and turn left (north). Travel 0.2 miles staying right (do not go down the road to PR Spring and campground), then continue left for 0.4 miles. Turn left again and travel approximately 0.25 miles to a weather station and to the exclosure. The 0-foot stake in the total exclosure is located near the fence separating the total and livestock exclosures. The 0-foot stake is five fence posts from the north fence. The first baseline is 100 feet long and the second baseline is 86 feet long. The 0-foot stake is marked by browse tag #435.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SWEET WATER |
| Elevation | 8,200ft (2,499m) |
| Aspect | South-Southeast |
| Slope | 3% |
| Sample Dates | 06/19/2002, 06/15/2005, 06/15/2010, 06/02/2015, 06/09/2020, 06/23/2025 |

## ildlife Habitat and Vegetation History

**Table 10R-32.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10R-32.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2002 | Mixed Mountain Brush | No Encroachment |
| 2005 | Mixed Mountain Brush | No Encroachment |
| 2010 | Mixed Mountain Brush | No Encroachment |
| 2015 | Mixed Mountain Brush | No Encroachment |
| 2020 | Mixed Mountain Brush | No Encroachment |
| 2025 | Mixed Mountain Brush | No Encroachment |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Loam (Browse*) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 2002, this site has remained stable as a mixed mountain brush plant community including mountain snowberry (*Symphoricarpos oreophilus*), alderleaf mountain mahogany (*Cercocarpus montanus*), and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), among others (Table 10R-32.12, Table 10R-32.13). The herbaceous understory has remained in good condition with the perennial grass species Ross' sedge (*Carex rossii*) and muttongrass (*Poa fendleriana*) and the perennial forb species timber milkvetch (*Astragalus miser*) contributing the most cover. The introduced and noxious annual forb species nodding plumeless thistle (*Carduus nutans*) was observed for the first time in 2025, but with low abundance (Table 10R-32.10, Table 10R--32.11). Barring a major disturbance, this site will likely remain in this or a similar state in future sample years.

The diverse and abundant grass and preferred browse communities on this site could provide adequate forage for summering mule deer, though this habitat is found within a wildlife exclosure. However, during the 2024/25 winter season the area had frequent occurrences of nearby collared elk (Wildlife Migration Initiative). As expected, pellet transect data indicates the absence of deer, elk, and cattle and/or bison since 2005 (Table 10R-32.9). On-site observations state that there was little to no utilization of the herbaceous understory during the most recent sample year (2025) (Photos, Table 10R-32.10, Table 10R-32.11).

## Trend Summary Tables

**Table 10R-32.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2002 | 51.7 | 3.7 | - | 59.8 | 1.9 | - |
| 2005 | 45.5 | 3.8 | - | 66.9 | 2.7 | - |
| 2010 | 53.5 | 5.2 | - | 73.8 | 3.7 | - |
| 2015 | 43.5 | 3.6 | - | 62.1 | 2.6 | - |
| 2020 | 71.1 | 6.5 | - | 90.4 | 5.7 | - |
| 2025 | 60.5 | 6.8 | - | 73.6 | 4.4 | - |

**Table 10R-32.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2002 | - | 326 | 9 | 243 | - | 12.5 | 0.0 | 6.5 |
| 2005 | - | 350 | 75 | 221 | - | 13.1 | 0.3 | 8.1 |
| 2010 | - | 327 | 15 | 168 | - | 18.1 | 0.1 | 6.7 |
| 2015 | - | 346 | 94 | 209 | - | 13.6 | 0.7 | 5.4 |
| 2020 | - | 313 | 79 | 197 | - | 14.4 | 0.5 | 7.6 |
| 2025 | - | 307 | 40 | 168 | - | 12.6 | 1.9 | 5.6 |

**Table 10R-32.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2002 | 9.2 | 0.3 | 58.6 | 7.2 | 0.2 | 58.1 |
| 2005 | 3.2 | 0.1 | 50.2 | 8.3 | 0.0 | 58.7 |
| 2010 | 4.7 | 0.2 | 57.8 | 5.9 | 0.0 | 74.7 |
| 2015 | 6.3 | 0.3 | 62.1 | 3.6 | 0.0 | 62.2 |
| 2020 | 3.3 | 0.2 | 54.7 | 2.2 | 0.1 | 76.5 |
| 2025 | 3.4 | 0.0 | 59.4 | 2.0 | 0.4 | 65.3 |

**Table 10R-32.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2002 | 1 | 15 | 9 | 12 |
| 2005 | 1 | 3 | - | 42 |
| 2010 | - | - | - | 4 |
| 2015 | - | - | - | 46 |
| 2020 | - | - | - | 14 |
| 2025 | - | - | - | 13 |
| Year | Days Use Per Acre (ha) | | | |
| 2002 | 7.2 (17.9) | 38.9 (96.0) | 22.8 (56.3) | - |
| 2005 | - | - | - | - |
| 2010 | - | - | - | - |
| 2015 | - | - | - | - |
| 2020 | - | - | - | - |
| 2025 | - | - | - | - |

**Table 10R-32.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Carex geyeri (Geyer's sedge) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 2002 | - | - | - | 148 | 193 | 6 | 74 | 16 | 5 |
| 2005 | - | - | - | 92 | 189 | - | 113 | 68 | 4 |
| 2010 | - | - | - | 103 | 148 | 3 | 95 | 64 | 4 |
| 2015 | - | - | - | 142 | 156 | - | 106 | 114 | 5 |
| 2020 | - | - | - | 201 | 199 | 42 | 15 | 59 | 3 |
| 2025 | 3 | 64 | 18 | 171 | 106 | 6 | 51 | 89 | - |
| year | Average Cover (%) | | | | | | | | |
| 2002 | - | - | - | 5.3 | 3.8 | 0.2 | 2.8 | 0.3 | 0.1 |
| 2005 | - | - | - | 3.1 | 2.8 | - | 4.3 | 2.8 | 0.0 |
| 2010 | - | - | - | 4.8 | 2.8 | 0.0 | 6.5 | 3.8 | 0.1 |
| 2015 | - | - | - | 4.9 | 1.0 | - | 4.8 | 2.9 | 0.0 |
| 2020 | - | - | - | 8.6 | 2.6 | 1.2 | 0.6 | 1.4 | 0.0 |
| 2025 | 0.0 | 1.1 | 0.7 | 6.7 | 1.4 | 0.1 | 1.7 | 0.9 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-32.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Arenaria (sandwort) | Astragalus miser (timber milkvetch) | Astragalus purshii (woollypod milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Carduus nutans[ani] (nodding plumeless thistle) | Castilleja flava (yellow Indian paintbrush) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2002 | 4 | - | 4 | 5 | 91 | 6 | 1 | - | 31 | 19 | 2 | - | 5 | - | 75 | 18 | 20 |
| 2005 | - | 12 | 3 | 11 | 77 | 1 | - | - | 16 | 14 | 9 | - | 0 | 3 | 80 | 4 | 14 |
| 2010 | 2 | - | - | - | 76 | 1 | - | - | 10 | 20 | - | - | 6 | - | 44 | - | 13 |
| 2015 | 6 | 35 | - | 9 | 82 | 5 | - | - | 2 | 41 | 45 | 1 | 9 | 5 | 34 | 2 | 38 |
| 2020 | - | - | 1 | 13 | 82 | - | - | - | 11 | 57 | 58 | 8 | 2 | - | 9 | 4 | 34 |
| 2025 | 6 | - | 3 | 1 | 83 | 2 | - | 31 | 9 | - | 7 | - | 9 | - | 24 | 6 | 37 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2002 | 0.0 | - | 0.0 | 0.0 | 2.8 | 0.2 | 0.0 | - | 0.5 | 0.2 | 0.0 | - | 0.0 | - | 0.5 | 0.1 | 0.4 |
| 2005 | - | 0.1 | 0.0 | 0.1 | 3.0 | 0.0 | - | - | 0.1 | 0.7 | 0.0 | - | 0.0 | 0.0 | 1.0 | 0.0 | 0.7 |
| 2010 | 0.1 | - | - | - | 3.6 | 0.0 | - | - | 0.2 | 1.2 | - | - | 0.0 | - | 0.4 | - | 0.1 |
| 2015 | 0.1 | 0.2 | - | 0.2 | 2.1 | 0.0 | - | - | 0.0 | 1.1 | 0.2 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.3 |
| 2020 | - | - | 0.0 | 0.1 | 3.8 | - | - | - | 0.0 | 1.5 | 0.3 | 0.2 | 0.1 | - | 0.0 | 0.0 | 1.2 |
| 2025 | 0.0 | - | 0.0 | 0.0 | 3.0 | 0.0 | - | 1.9 | 0.1 | - | 0.0 | - | 0.1 | - | 0.1 | 0.3 | 1.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Ipomopsis aggregata (scarlet gilia) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Packera dimorphophylla (splitleaf groundsel) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Streptanthus cordatus (heartleaf twistflower) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 2002 | 4 | 3 | 11 | 4 | - | - | 129 | 7 | - | - | - | - | - | - | 14 | 4 |
| 2005 | 2 | 11 | 9 | 4 | - | - | 104 | 18 | 54 | - | 2 | - | - | 1 | 24 | 1 |
| 2010 | - | 1 | 12 | 4 | - | - | 40 | 9 | 5 | 5 | 9 | - | 1 | 10 | 5 | - |
| 2015 | 8 | 5 | 17 | - | - | 3 | 59 | 12 | 16 | 3 | 10 | - | 3 | - | 16 | 1 |
| 2020 | 17 | 1 | 6 | - | - | - | 45 | - | 14 | - | 10 | - | - | 12 | 5 | 4 |
| 2025 | 5 | - | 15 | - | 1 | - | 31 | 12 | 5 | - | 1 | 2 | - | - | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 2002 | 0.0 | 0.0 | 0.1 | 0.0 | - | - | 1.6 | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 |
| 2005 | 0.0 | 0.0 | 0.2 | 0.0 | - | - | 1.8 | 0.1 | 0.2 | - | 0.0 | - | - | 0.0 | 0.3 | 0.0 |
| 2010 | - | 0.0 | 0.2 | 0.2 | - | - | 0.4 | 0.1 | 0.0 | 0.0 | 0.1 | - | 0.0 | 0.1 | 0.0 | - |
| 2015 | 0.1 | 0.0 | 0.1 | - | - | 0.1 | 0.7 | 0.0 | 0.1 | 0.0 | 0.2 | - | 0.0 | - | 0.1 | 0.0 |
| 2020 | 0.2 | 0.0 | 0.0 | - | - | - | 0.4 | - | 0.0 | - | 0.1 | - | - | 0.1 | 0.0 | 0.0 |
| 2025 | 0.0 | - | 0.2 | - | 0.0 | - | 0.4 | 0.1 | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-32.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 2002 | 13.6 | 20.1 | 5.4 | 1 | 0.9 | 0.2 | 0.2 | 20.3 | - |
| 2005 | 15.4 | 17.8 | 10.3 | 2.7 | - | 0.3 | 0.7 | 22.4 | - |
| 2010 | 14.7 | 20.9 | 11.3 | 3.7 | - | 0.7 | 1.8 | 24.4 | - |
| 2015 | 13.9 | 19.4 | 12 | 2.6 | - | 0.7 | - | 16.1 | - |
| 2020 | 12.1 | 17.3 | 24.5 | 5.7 | - | 1.1 | 2.2 | 33.2 | - |
| 2025 | 14.4 | 10 | 19.3 | 4.4 | - | 0.3 | 2.3 | 27.3 | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 2002 | 11.3 | 14.2 | 7.5 | 3.6 | 0.0 | 0.3 | 0.9 | 17.5 | 0.0 |
| 2005 | 10.3 | 12.1 | 6.9 | 3.7 | - | 0.1 | 0.4 | 15.7 | 0.0 |
| 2010 | 10.6 | 14.0 | 6.3 | 5.2 | - | 1.9 | 1.1 | 19.6 | - |
| 2015 | 9.5 | 12.5 | 5.8 | 3.6 | 0.0 | 0.6 | 0.1 | 15.0 | - |
| 2020 | 13.7 | 14.2 | 13.3 | 6.4 | 0.0 | 0.6 | 1.9 | 27.4 | - |
| 2025 | 14.3 | 9.0 | 13.0 | 6.8 | - | 0.7 | 2.3 | 21.1 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

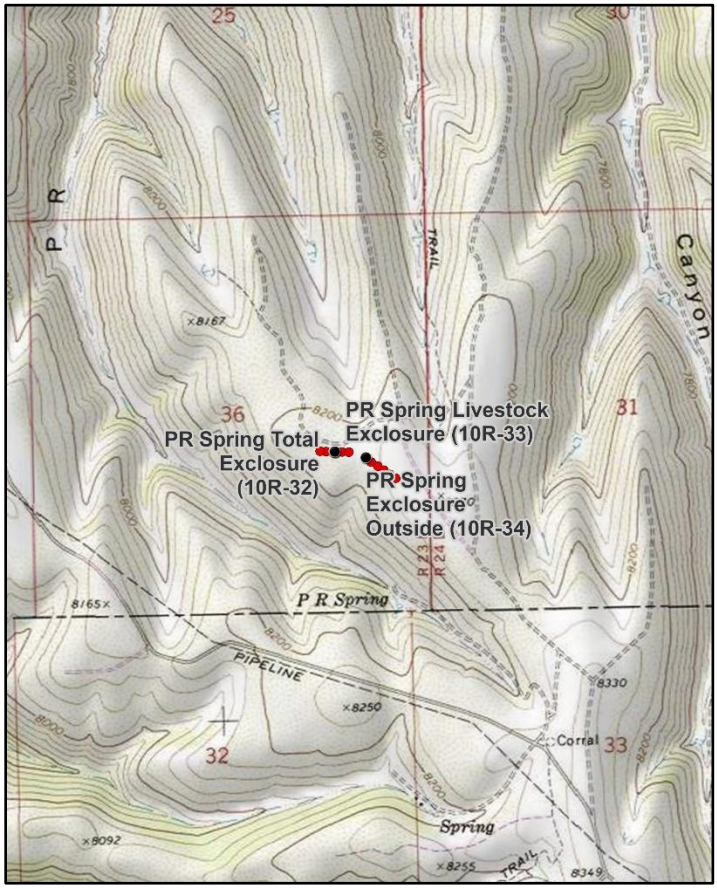
**Table 10R-32.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

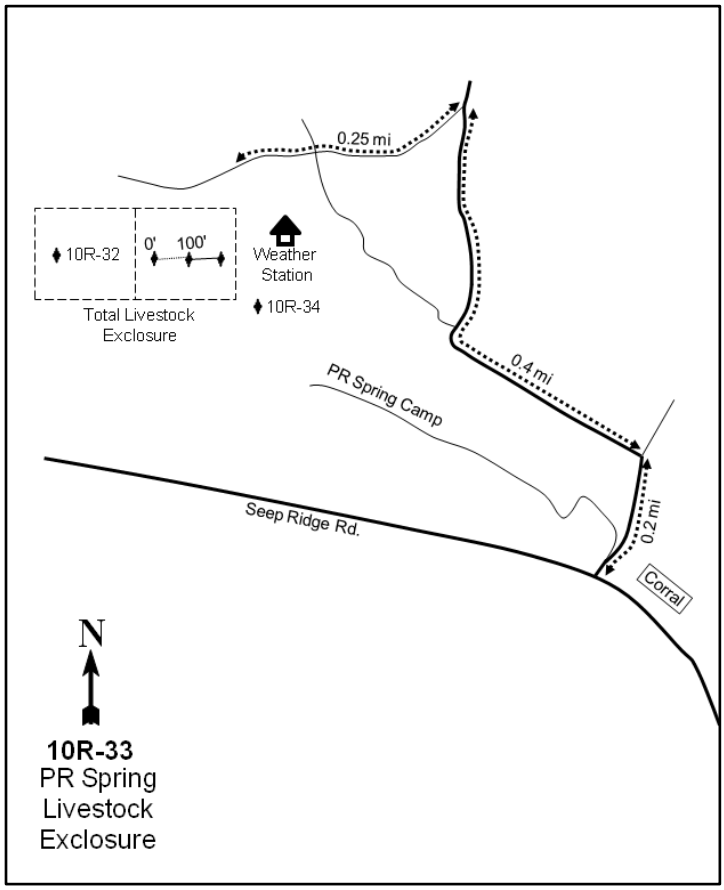
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 2002 | 1800 | 20 | 42 | 49 | 9 | 16 | 26 | 4 | 123/123 |
| 2005 | 1300 | 20 | 39 | 43 | 19 | 0 | 0 | 14 | 119/127 |
| 2010 | 1080 | 200 | 17 | 82 | 2 | 0 | 0 | 7 | 133/135 |
| 2015 | 2000 | 100 | 17 | 76 | 7 | 11 | 0 | 20 | 136/142 |
| 2020 | 1180 | 100 | 39 | 61 | 0 | 0 | 0 | 12 | 143/138 |
| 2025 | 1040 | 40 | 23 | 69 | 8 | 0 | 0 | 21 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 2002 | 3560 | 100 | 21 | 64 | 15 | 10 | 5 | 6 | 76/98 |
| 2005 | 3180 | 320 | 13 | 60 | 27 | 0 | 0 | 26 | 59/80 |
| 2010 | 3000 | - | 9 | 83 | 9 | 3 | 0 | 8 | 68/91 |
| 2015 | 2980 | - | 4 | 77 | 19 | 3 | 1 | 23 | 62/81 |
| 2020 | 2680 | - | 12 | 69 | 19 | 0 | 0 | 16 | 74/96 |
| 2025 | 2340 | - | 2 | 60 | 39 | 0 | 0 | 39 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 107/156 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2002 | 2920 | 80 | 26 | 73 | 1 | 14 | 52 | 2 | 107/90 |
| 2005 | 2600 | 220 | 30 | 59 | 11 | 0 | 0 | 12 | 118/95 |
| 2010 | 2760 | 140 | 30 | 68 | 2 | 0 | 0 | 3 | 130/101 |
| 2015 | 3460 | 400 | 24 | 70 | 6 | 1 | 2 | 7 | 114/73 |
| 2020 | 3360 | 60 | 8 | 89 | 3 | 0 | 0 | 2 | 128/94 |
| 2025 | 3180 | 280 | 13 | 79 | 8 | 0 | 0 | 8 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2002 | 2980 | 40 | 9 | 90 | 1 | 0 | 0 | 0 | 32/35 |
| 2005 | 2680 | - | 8 | 91 | 2 | 4 | 1 | 2 | 26/35 |
| 2010 | 2660 | 60 | 11 | 89 | 1 | 0 | 0 | 2 | 38/41 |
| 2015 | 3340 | 20 | 22 | 75 | 4 | 19 | 6 | 5 | 32/35 |
| 2020 | 3880 | - | 5 | 94 | 1 | 0 | 0 | 1 | 40/46 |
| 2025 | 3380 | 20 | 1 | 91 | 8 | 0 | 0 | 8 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 10/18 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2002 | 260 | - | 0 | 92 | 8 | 31 | 46 | 15 | 27/46 |
| 2005 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | 32/53 |
| 2010 | 180 | 20 | 22 | 78 | 0 | 0 | 0 | 0 | 57/72 |
| 2015 | 280 | - | 7 | 93 | 0 | 0 | 0 | 7 | 63/82 |
| 2020 | 300 | 20 | 7 | 93 | 0 | 0 | 0 | 7 | 68/85 |
| 2025 | 180 | - | 0 | 89 | 11 | 0 | 0 | 11 | - / - |
| Quercus gambelii[p] -- (Gambel oak) | | | | | | | | | |
| 2002 | 560 | 20 | 50 | 50 | 0 | 4 | 0 | 0 | - / - |
| 2005 | 920 | 40 | 94 | 7 | 0 | 0 | 0 | 0 | 35/24 |
| 2010 | 300 | 800 | 33 | 67 | 0 | 0 | 0 | 27 | 53/30 |
| 2015 | 180 | 180 | 56 | 22 | 22 | 0 | 0 | 22 | 153/63 |
| 2020 | 720 | - | 47 | 47 | 6 | 0 | 0 | 14 | 77/49 |
| 2025 | 1200 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2002 | 5320 | 140 | 18 | 82 | 0 | 0 | 0 | 0 | 43/77 |
| 2005 | 8220 | - | 19 | 81 | 0 | 0 | 0 | 0 | 37/53 |
| 2010 | 8000 | - | 22 | 78 | 0 | 0 | 0 | 1 | 45/72 |
| 2015 | 12880 | 1240 | 33 | 67 | 0 | 0 | 0 | 0 | 37/44 |
| 2020 | 9200 | 60 | 14 | 87 | 0 | 0 | 0 | 0 | 46/57 |
| 2025 | 8500 | 100 | 12 | 88 | 1 | 0 | 0 | 1 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2002 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | 18/21 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/17 |
| 2010 | 80 | - | 0 | 75 | 25 | 0 | 0 | 25 | - / - |
| 2015 | - | - | - | - | - | - | - | - | 29/26 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/23 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# PR SPRING LIVESTOCK EXCLOSURE - STUDY NO. 10R-33




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | P R Spring NE; Township 15S, Range 23E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 647372 East 4370118 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 423 |
| Transect Bearing | 80° magnetic |
| Length | 200ft |
| Belt Placement | Line 1 (34ft, 59ft, & 95ft), Line 2 (11ft & 71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Seep Ridge Road, travel to the PR Spring turnoff and turn left (north). Travel 0.2 miles staying to the right (do not go down the road to PR Spring and campground), then continue left for 0.4 miles. Turn left again and travel approximately 0.25 miles to a weather station and then to the exclosure. The 0-foot stake in the livestock exclosure is located near the fence separating the total and livestock exclosures. The 0-foot stake is marked by browse tag #423.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SWEET WATER |
| Elevation | 8,200ft (2,499m) |
| Aspect | South-Southeast |
| Slope | 3% |
| Sample Dates | 06/19/2002, 06/15/2005, 06/15/2010, 06/02/2015, 06/09/2020, 06/24/2025 |

## Wildlife Habitat and Vegetation History

**Table 10R-33.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10R-33.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2002 | Mixed Mountain Brush | No Encroachment |
| 2005 | Mixed Mountain Brush | No Encroachment |
| 2010 | Mixed Mountain Brush | No Encroachment |
| 2015 | Mixed Mountain Brush | No Encroachment |
| 2020 | Mixed Mountain Brush | No Encroachment |
| 2025 | Mixed Mountain Brush | No Encroachment |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Loam (Browse*) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 2002, this site has existed as a stable mixed mountain brush plant community with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and mountain snowberry (*Symphoricarpos oreophilus*) contributing the most shrub cover (Table 10R-33.12). The herbaceous understory has remained in good condition with high cover and diversity. In recent sample years, the perennial grass species Ross' sedge (*Carex rossii*); Kentucky bluegrass (*Poa pratensis*); prairie junegrass (*Koeleria macrantha*); thickspike wheatgrass (*Elymus lanceolatus*); and the perennial forb species timber milkvetch (*Astragalus miser*) have generally been the dominant herbaceous species. The introduced and noxious annual forb species nodding plumeless thistle (*Carduus nutans*) was observed for the first time in 2025, but with low abundance (Table 10R-33.10, Table 10R-33.11).

The diverse and abundant grass and preferred browse communities on this site could provide adequate forage for summering mule deer. Pellet transect data indicates that deer presence has ranged between low and high over the sample years but has displayed an overall decreasing trend. However, elk presence was moderate in most years sampled, except in 2010 when elk presence was considered low. During the 2024/25 winter season the area had frequent occurrences of collared elk (Wildlife Migration Initiative). Bison and/or cattle presence was moderate between 2002 and 2005 but low to absent in all other sample years (Photos, Table 10R-33.9, Table 10R-33.10, Table 10R-33.11, Table 10R-33.12). On-site observations state that there was little to no utilization of the herbaceous understory during the most recent sample year (2025).

## Trend Summary Tables

**Table 10R-33.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2002 | 34.0 | 1.6 | - | 44.0 | 1.4 | - |
| 2005 | 33.6 | 2.0 | - | 46.0 | 2.2 | - |
| 2010 | 27.4 | 1.4 | - | 44.9 | 1.4 | - |
| 2015 | 32.9 | 1.4 | - | 44.7 | 1.7 | - |
| 2020 | 34.9 | 3.6 | - | 52.1 | 2.8 | - |
| 2025 | 33.2 | 1.6 | - | 38.7 | 2.2 | - |

**Table 10R-33.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2002 | - | 333 | 10 | 326 | - | 14.0 | 0.0 | 9.3 |
| 2005 | - | 351 | 84 | 277 | - | 17.3 | 0.5 | 11.5 |
| 2010 | - | 365 | 26 | 283 | - | 17.0 | 0.2 | 7.7 |
| 2015 | - | 381 | 83 | 281 | - | 18.8 | 0.7 | 5.4 |
| 2020 | - | 391 | 94 | 303 | - | 23.1 | 0.7 | 13.5 |
| 2025 | - | 394 | 10 | 269 | - | 14.4 | 0.0 | 8.9 |

**Table 10R-33.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2002 | 20.1 | 0.0 | 46.1 | 6.3 | 1.2 | 51.8 |
| 2005 | 20.7 | 0.2 | 38.5 | 6.4 | 1.4 | 55.0 |
| 2010 | 13.9 | 0.4 | 53.3 | 4.1 | 0.4 | 56.0 |
| 2015 | 17.2 | 0.2 | 46.8 | 5.2 | 0.8 | 57.2 |
| 2020 | 13.4 | 0.3 | 50.4 | 3.9 | 1.6 | 61.7 |
| 2025 | 16.3 | 0.1 | 45.6 | 3.3 | 1.1 | 51.1 |

**Table 10R-33.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2002 | 3 | 14 | 7 | 11 |
| 2005 | 1 | 22 | 14 | 37 |
| 2010 | - | 14 | 3 | 5 |
| 2015 | - | 20 | 17 | 14 |
| 2020 | 1 | 18 | 21 | 5 |
| 2025 | - | 28 | 21 | 2 |
| Year | Days Use Per Acre (ha) | | | |
| 2002 | 13.8 (34.1) | 47.6 (117.5) | 18.7 (46.3) | - |
| 2005 | 13.8 (34.1) | 63.0 (155.6) | 21.5 (53.0) | - |
| 2010 | - | 24.8 (61.2) | 10.7 (26.5) | - |
| 2015 | 2.9 (7.2) | 22.8 (56.3) | 24.8 (61.2) | - |
| 2020 | 2.2 (5.4) | 6.7 (16.6) | 20.8 (51.3) | - |
| 2025 | - | 13.4 (33.1) | 37.5 (92.7) | - |

**Table 10R-33.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum nelsonii (Columbia needlegrass) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 2002 | - | 187 | 5 | 102 | - | 24 | 136 | - | 1 |
| 2005 | - | 139 | 1 | 124 | 8 | 31 | 185 | 9 | 41 |
| 2010 | - | 100 | - | 145 | 23 | 41 | 150 | 19 | 20 |
| 2015 | - | 145 | - | 170 | 7 | 72 | 184 | - | - |
| 2020 | - | 120 | 5 | 256 | 98 | 8 | 82 | 3 | - |
| 2025 | 37 | 133 | 13 | 311 | 25 | 5 | 50 | 5 | - |
| year | Average Cover (%) | | | | | | | | |
| 2002 | - | 8.9 | 0.0 | 1.1 | - | 0.6 | 3.4 | - | 0.0 |
| 2005 | - | 6.2 | 0.0 | 2.2 | 0.1 | 0.6 | 7.2 | 0.2 | 0.7 |
| 2010 | - | 4.8 | - | 1.2 | 0.8 | 1.1 | 7.9 | 0.8 | 0.5 |
| 2015 | - | 5.0 | - | 3.3 | 0.5 | 1.8 | 8.2 | - | - |
| 2020 | - | 4.2 | 0.1 | 10.4 | 6.1 | 0.0 | 2.2 | 0.0 | - |
| 2025 | 0.6 | 4.4 | 0.1 | 6.0 | 1.1 | 0.1 | 1.8 | 0.2 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-33.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Arenaria (sandwort) | Astragalus miser (timber milkvetch) | Astragalus utahensis (Utah milkvetch) | Carduus nutans[ani] (nodding plumeless thistle) | Castilleja flava (yellow Indian paintbrush) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Crepis acuminata (tapertip hawksbeard) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2002 | 7 | - | 12 | - | - | - | 146 | 5 | - | 25 | 8 | - | 5 | - | 130 | 22 | 14 |
| 2005 | - | 19 | 28 | - | - | - | 135 | 6 | - | 12 | 4 | 9 | 12 | - | 104 | 15 | 12 |
| 2010 | 0 | 4 | 16 | - | - | 15 | 147 | 4 | - | 3 | 2 | 1 | 2 | - | 100 | - | 12 |
| 2015 | - | 66 | 19 | - | 3 | 3 | 150 | 10 | - | 12 | 2 | 9 | 8 | - | 72 | - | 33 |
| 2020 | - | 5 | 17 | - | - | 2 | 167 | 12 | - | 11 | 7 | 42 | 9 | 4 | 78 | 5 | 11 |
| 2025 | 8 | 2 | - | 7 | 8 | - | 145 | 2 | 2 | 2 | - | - | 1 | - | 79 | - | 29 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2002 | 0.0 | - | 0.1 | - | - | - | 5.0 | 0.0 | - | 0.4 | 0.0 | - | 0.0 | - | 0.8 | 0.2 | 0.1 |
| 2005 | - | 0.1 | 0.4 | - | - | - | 5.1 | 0.1 | - | 0.1 | 0.1 | 0.0 | 0.1 | - | 1.1 | 0.1 | 0.1 |
| 2010 | 0.0 | 0.0 | 0.1 | - | - | 0.1 | 4.3 | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.6 | - | 0.1 |
| 2015 | - | 0.6 | 0.1 | - | 0.0 | 0.0 | 2.1 | 0.1 | - | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.4 | - | 0.1 |
| 2020 | - | 0.0 | 0.5 | - | - | 0.0 | 6.9 | 0.1 | - | 0.2 | 0.0 | 0.3 | 0.2 | 0.0 | 0.6 | 0.1 | 0.0 |
| 2025 | 0.0 | 0.0 | - | 0.1 | 0.0 | - | 3.8 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.6 | - | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Galium aparine[a] (stickywilly) | Ipomopsis aggregata (scarlet gilia) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Packera dimorphophylla (splitleaf groundsel) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Senecio integerrimus[a] (lambstongue ragwort) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Symphyotrichum ascendens (western aster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2002 | - | - | 5 | 9 | 2 | 13 | - | - | 3 | 217 | 90 | 5 | 1 | - | 11 | - | - |
| 2005 | - | - | 8 | 16 | 2 | 6 | - | - | 0 | 166 | 87 | 60 | 0 | 1 | 7 | - | - |
| 2010 | - | - | 6 | 11 | 4 | 9 | - | - | - | 136 | 84 | 5 | 1 | 10 | 1 | 2 | - |
| 2015 | 5 | - | 15 | 16 | - | 4 | 1 | - | 11 | 153 | 87 | - | 1 | 2 | 5 | 10 | - |
| 2020 | - | 6 | 6 | 5 | - | - | 1 | - | 3 | 137 | 87 | 62 | 6 | 12 | 6 | 1 | 1 |
| 2025 | - | 8 | - | 9 | - | - | 1 | 3 | 5 | 144 | 54 | 6 | 1 | - | 8 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2002 | - | - | 0.0 | 0.0 | 0.1 | 0.1 | - | - | 0.0 | 1.9 | 0.3 | 0.0 | 0.0 | - | 0.1 | - | - |
| 2005 | - | - | 0.0 | 0.1 | 0.0 | 0.1 | - | - | 0.0 | 3.1 | 0.6 | 0.2 | 0.0 | 0.2 | 0.2 | - | - |
| 2010 | - | - | 0.0 | 0.1 | 0.0 | 0.1 | - | - | - | 1.7 | 0.4 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - |
| 2015 | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.0 | - | 0.1 | 1.6 | 0.4 | - | 0.0 | 0.0 | 0.0 | 0.0 | - |
| 2020 | - | 0.0 | 0.0 | 0.2 | - | - | 0.1 | - | 0.0 | 3.3 | 0.5 | 0.2 | 0.0 | 0.1 | 0.3 | 0.0 | 0.0 |
| 2025 | - | 0.0 | - | 0.1 | - | - | 0.0 | 0.0 | 0.2 | 3.2 | 0.3 | 0.0 | 0.0 | - | 0.2 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|
| year | Nested | |
| 2002 | 4 | - |
| 2005 | 25 | 2 |
| 2010 | 10 | - |
| 2015 | 25 | - |
| 2020 | 24 | 4 |
| 2025 | 3 | - |
| year | Average Cover (%) | |
| 2002 | 0.0 | - |
| 2005 | 0.3 | 0.0 |
| 2010 | 0.1 | - |
| 2015 | 0.1 | - |
| 2020 | 0.2 | 0.0 |
| 2025 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-33.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | |
| 2002 | 9.1 | 17.7 | 5.1 | - | 1.2 | - | 0 | - | 1.3 | 0.2 | 10.6 | 0.2 |
| 2005 | 8.1 | 17.5 | 5.6 | 0.1 | 1.9 | - | 0.1 | 0.2 | 0.5 | 0.2 | 14 | 0 |
| 2010 | 6.4 | 20.8 | 4.6 | 0.1 | 1.4 | - | - | - | 0.4 | 0.1 | 12.5 | - |
| 2015 | 4.8 | 19.8 | 5.6 | 0.1 | 1.3 | - | - | 0.3 | 0.3 | - | 14.1 | 0.1 |
| 2020 | 3.8 | 22.4 | 6 | 0.1 | 2.5 | - | 0.2 | - | 0.4 | - | 19.4 | 0.1 |
| 2025 | 4.3 | 15 | 6.2 | 0.2 | 1.9 | - | 0.3 | 0 | - | 0.2 | 12.8 | 0 |
| year | Quadrat Cover (%) | | | | | | | | | | | |
| 2002 | 5.4 | 15.1 | 3.4 | 0.0 | 1.0 | - | 0.0 | - | 0.5 | 0.0 | 9.7 | 0.6 |
| 2005 | 4.2 | 13.7 | 3.5 | 0.0 | 1.3 | - | 0.3 | 0.0 | 0.9 | 0.0 | 11.3 | 0.4 |
| 2010 | 2.6 | 13.0 | 2.3 | 0.0 | 1.3 | - | 0.1 | - | 0.2 | 0.0 | 9.3 | 0.1 |
| 2015 | 2.9 | 17.5 | 2.0 | 0.2 | 1.0 | - | - | 0.1 | 0.3 | - | 10.0 | 0.2 |
| 2020 | 3.2 | 15.4 | 3.1 | 0.0 | 3.0 | 0.1 | 0.3 | - | 0.0 | - | 13.2 | 0.2 |
| 2025 | 2.6 | 13.6 | 4.3 | 0.2 | 1.5 | - | 0.0 | 0.0 | 0.2 | 0.0 | 12.3 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-33.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

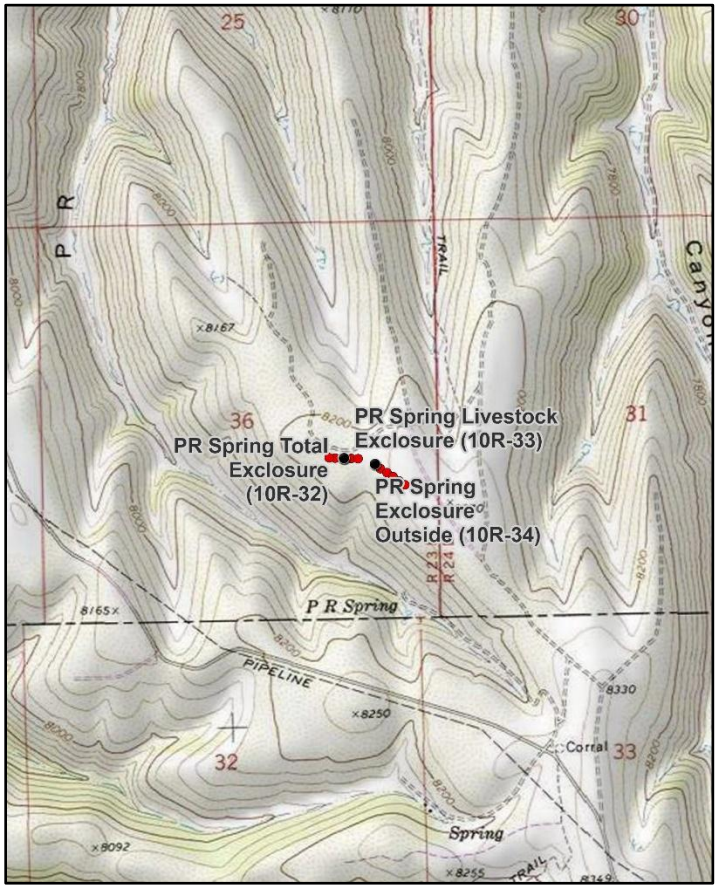
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2002 | 1760 | 100 | 52 | 42 | 6 | 22 | 25 | 5 | 119/114 |
| 2005 | 1920 | 400 | 60 | 32 | 7 | 15 | 20 | 6 | 112/98 |
| 2010 | 1700 | 160 | 46 | 49 | 5 | 24 | 27 | 6 | 99/87 |
| 2015 | 1820 | 320 | 43 | 53 | 4 | 23 | 28 | 18 | 105/91 |
| 2020 | 1420 | 1360 | 70 | 24 | 6 | 7 | 17 | 6 | 101/84 |
| 2025 | 1000 | 100 | 62 | 32 | 6 | 16 | 26 | 16 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2002 | 3240 | 120 | 14 | 50 | 36 | 6 | 10 | 11 | 74/95 |
| 2005 | 2940 | 100 | 10 | 61 | 29 | 18 | 1 | 16 | 74/94 |
| 2010 | 2980 | 220 | 6 | 76 | 18 | 50 | 7 | 15 | 71/101 |
| 2015 | 2600 | 120 | 13 | 60 | 27 | 55 | 12 | 32 | 61/84 |
| 2020 | 3020 | 60 | 13 | 66 | 21 | 31 | 10 | 26 | 70/92 |
| 2025 | 3240 | 160 | 14 | 59 | 28 | 46 | 24 | 29 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2002 | 1240 | 80 | 34 | 63 | 3 | 14 | 50 | 0 | 125/102 |
| 2005 | 1540 | 60 | 17 | 62 | 21 | 20 | 70 | 20 | 108/80 |
| 2010 | 1500 | - | 23 | 73 | 4 | 41 | 35 | 3 | 91/71 |
| 2015 | 1480 | 100 | 35 | 57 | 8 | 20 | 53 | 11 | 97/77 |
| 2020 | 1260 | 480 | 22 | 67 | 11 | 11 | 67 | 10 | 117/91 |
| 2025 | 1640 | 100 | 24 | 71 | 5 | 12 | 68 | 5 | - / - |

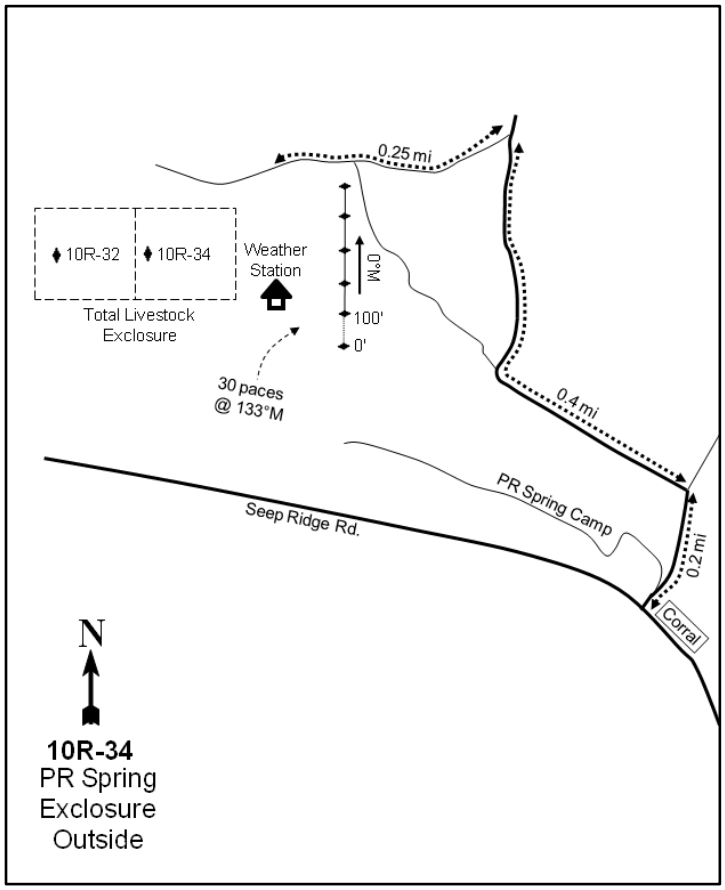
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 2002 | 120 | - | 0 | 100 | 0 | 33 | 0 | 0 | 7/22 |
| 2005 | 80 | - | 0 | 100 | 0 | 75 | 0 | 0 | 8/17 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/22 |
| 2015 | 240 | - | 25 | 75 | 0 | 33 | 8 | 0 | 9/13 |
| 2020 | 100 | - | 0 | 80 | 20 | 20 | 60 | 20 | 21/30 |
| 2025 | 100 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2002 | 2160 | - | 12 | 82 | 7 | 1 | 0 | 2 | 25/28 |
| 2005 | 1900 | - | 23 | 77 | 0 | 3 | 0 | 0 | 27/31 |
| 2010 | 1600 | - | 6 | 91 | 3 | 1 | 0 | 1 | 28/33 |
| 2015 | 2240 | 120 | 34 | 65 | 1 | 37 | 7 | 2 | 22/23 |
| 2020 | 2840 | - | 1 | 95 | 4 | 3 | 4 | 4 | 26/29 |
| 2025 | 2220 | 140 | 13 | 78 | 9 | 60 | 8 | 9 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 28/27 |
| 2020 | - | - | - | - | - | - | - | - | 48/60 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2002 | 240 | - | 17 | 67 | 17 | 0 | 0 | 0 | 10/14 |
| 2005 | 340 | - | 41 | 59 | 0 | 0 | 6 | 0 | 13/21 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 520 | - | 4 | 92 | 4 | 0 | 0 | 4 | 13/23 |
| 2025 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 2002 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 7/19 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/32 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/36 |
| 2025 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 2002 | 320 | - | 13 | 75 | 13 | 6 | 75 | 0 | 32/62 |
| 2005 | 300 | - | 0 | 60 | 40 | 0 | 73 | 7 | 35/57 |
| 2010 | 280 | 20 | 0 | 93 | 7 | 14 | 71 | 29 | 30/48 |
| 2015 | 360 | - | 6 | 78 | 17 | 11 | 89 | 22 | 24/50 |
| 2020 | 180 | - | 0 | 78 | 22 | 11 | 78 | 22 | 25/43 |
| 2025 | 220 | - | 9 | 82 | 9 | 9 | 82 | 9 | - / - |
| Quercus gambelii[P] -- (Gambel oak) | | | | | | | | | |
| 2002 | 100 | - | 80 | 20 | 0 | 0 | 0 | 0 | 44/17 |
| 2005 | 100 | - | 100 | 0 | 0 | 0 | 0 | 0 | 12/9 |
| 2010 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | 53/38 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 100 | - | 100 | 0 | 0 | 0 | 20 | 20 | 62/42 |
| 2025 | 240 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2002 | 4640 | - | 25 | 73 | 2 | 3 | 0 | 1 | 39/64 |
| 2005 | 6060 | 100 | 17 | 82 | 1 | 9 | 0 | 0 | 37/50 |
| 2010 | 6500 | 160 | 33 | 67 | 0 | 5 | 0 | 1 | 32/49 |
| 2015 | 9140 | 140 | 34 | 66 | 0 | 20 | 4 | 0 | 31/45 |
| 2020 | 7260 | 40 | 16 | 84 | 0 | 4 | 0 | 2 | 33/45 |
| 2025 | 5260 | 20 | 5 | 93 | 2 | 56 | 9 | 2 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2002 | 720 | - | 17 | 75 | 8 | 6 | 11 | 0 | 10/13 |
| 2005 | 740 | - | 22 | 78 | 0 | 43 | 35 | 0 | 14/17 |
| 2010 | 240 | 20 | 17 | 75 | 8 | 17 | 50 | 8 | 14/17 |
| 2015 | 420 | 60 | 19 | 76 | 5 | 52 | 10 | 5 | 16/12 |
| 2020 | 320 | - | 31 | 50 | 19 | 25 | 0 | 19 | 18/17 |
| 2025 | 60 | - | 33 | 0 | 67 | 33 | 33 | 67 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# PR SPRING EXCLOSURE OUTSIDE - STUDY NO. 10R-34




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | P R Spring NE; Township 15S, Range 23E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 647498 East 4370094 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 424 |
| Transect Bearing | 120° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft), Line 5 (71ft) |
| Belt Marker Placement | Belt 1: 1ft |

## Directions to Site

From Seep Ridge Road, travel to the PR Spring turnoff and turn left (north). Travel 0.2 miles while staying to the right (do not go down road to PR Spring and campground), then continue left for 0.4 miles. Turn left again and travel approximately 0.25 miles to a weather station and then the exclosure. From the southeast corner of the weather station, the 0-foot stake is 150 feet away at 133 degrees magnetic and is marked by browse tag #424.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SWEET WATER |
| Elevation | 8,200ft (2,499m) |
| Aspect | Southwest |
| Slope | 5% |
| Sample Dates | 06/20/2002, 06/15/2005, 06/15/2010, 06/08/2015, 06/09/2020, 06/24/2025 |

## Wildlife Habitat and Vegetation History

**Table 10R-34.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| American Bison | potential | year-long |
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | |

**Table 10R-34.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2002 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 2002, the plant community on this site has remained dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Other shrubs such as mountain snowberry (*Symphoricarpos oreophilus*) and alderleaf mountain mahogany (*Cercocarpus montanus*) have also been present, but with much less cover (Table 10R-34.12). The herbaceous component has remained in good condition with the perennial grass and graminoid species Kentucky bluegrass (*Poa pratensis*), muttongrass (*P. fendleriana*), sedges (*Carex* spp.), and thickspike wheatgrass (*Elymus lanceolatus*) making up the majority of the understory (Table 10R-34.10). No one forb appears to have a strong presence in the herbaceous community, although the perennial species littleleaf and small-leaf pussytoes (*Antennaria microphylla* and *A. parvifolia*) contributed the most cover of any species in 2015, 2020, and 2025 (Table 10R-34.11). Rocky Mountain juniper (*Juniperus scopulorum*) has been observed throughout the study period (Photos, Table 10R-34.14); there may be potential for further tree encroachment in future sample years. However, the site has been considered to be within Early Phase I of woodland succession since 2002 (Table 10R-34.4), indicating that further encroachment is likely not an immediate concern.

The diverse and abundant grass and preferred browse communities on this site could provide adequate forage for summering mule deer. Pellet transect data indicates that deer presence has ranged between low and high over the sample years but has generally displayed an overall decreasing trend. Elk presence has also varied from low to high but has generally shown an increasing trend over the sample years. During the 2024/25 winter season the area had frequent occurrences of collared elk (Wildlife Migration Initiative). Bison and/or cattle presence was moderate in most years sampled but was high in 2015. On-site observations state that there was little to no utilization of the herbaceous understory during the most recent sample year (2025) and that there was good primary growth and seed production occurring (Photos, Table 10R-34.9, Table 10R-34.10, Table 10R-34.11).

## Trend Summary Tables

**Table 10R-34.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2002 | 34.5 | 0.8 | - | 41.8 | 0.7 | - |
| 2005 | 31.5 | 0.8 | - | 36.4 | 0.5 | - |
| 2010 | 29.8 | 0.4 | - | 45.7 | 0.8 | - |
| 2015 | 27.2 | 0.5 | - | 40.4 | 0.9 | - |
| 2020 | 34.0 | 0.3 | - | 49.6 | 0.4 | - |
| 2025 | 29.6 | 0.2 | - | 43.5 | 0.2 | - |

**Table 10R-34.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2002 | - | 402 | 37 | 276 | - | 16.3 | 0.1 | 6.0 |
| 2005 | - | 388 | 164 | 287 | - | 17.5 | 1.7 | 11.4 |
| 2010 | - | 401 | 81 | 262 | - | 24.9 | 0.5 | 8.4 |
| 2015 | - | 429 | 136 | 264 | - | 29.2 | 1.5 | 8.1 |
| 2020 | - | 412 | 174 | 281 | - | 16.7 | 2.0 | 11.2 |
| 2025 | - | 427 | 40 | 276 | - | 18.4 | 0.1 | 8.6 |

**Table 10R-34.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2002 | 13.0 | 0.0 | 52.8 | 2.6 | 0.2 | 52.4 |
| 2005 | 14.8 | 0.1 | 46.7 | 3.0 | 1.0 | 53.3 |
| 2010 | 11.5 | 0.2 | 59.5 | 0.6 | 1.1 | 59.8 |
| 2015 | 12.8 | 1.0 | 52.1 | 1.3 | 1.4 | 60.9 |
| 2020 | 12.3 | 0.7 | 50.6 | 0.4 | 1.2 | 56.8 |
| 2025 | 21.7 | 0.0 | 54.7 | 1.0 | 2.1 | 44.0 |

**Table 10R-34.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 2002 | 2 | - | 19 | 24 | 1 | 12 |
| 2005 | 4 | - | 18 | 17 | - | 41 |
| 2010 | 2 | - | 25 | 8 | - | 2 |
| 2015 | - | - | 6 | 16 | - | 4 |
| 2020 | 3 | - | 12 | 8 | - | 1 |
| 2025 | 3 | - | 23 | 35 | - | 1 |
| Year | Days Use Per Acre (ha) | | | | | |
| 2002 | 13.8 (34.1) | 8.7 (21.5)* | 73.0 (180.4) | 31.5 (77.8) | - | - |
| 2005 | 10.2 (25.1) | - | 22.8 (56.3) | 6.7 (16.6) | - | - |
| 2010 | 14.5 (35.9) | - | 42.2 (104.3) | 23.4 (57.9) | - | - |
| 2015 | 24.0 (59.2) | - | 15.4 (38.1) | 40.9 (101.0) | - | - |
| 2020 | 18.1 (44.8) | - | 10.7 (26.5) | 16.8 (41.4) | - | - |
| 2025 | 5.8 (14.3) | - | 19.4 (48.0) | 57.7 (142.4) | - | - |

*Pellets per acre (ha)

**Table 10R-34.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Carex (sedge) | Carex geyeri (Geyer's sedge) | Carex obtusata (obtuse sedge) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 2002 | - | 3 | 147 | - | - | - | - | 144 | 4 | - | - | 189 | 178 | 10 | 4 |
| 2005 | - | 10 | 115 | - | - | - | - | 206 | - | - | - | 169 | 127 | 2 | 7 |
| 2010 | - | 3 | 103 | - | - | - | - | 167 | 2 | - | - | 178 | 144 | 22 | 0 |
| 2015 | - | - | 127 | - | - | - | - | 201 | 6 | - | 16 | 171 | 259 | 3 | - |
| 2020 | - | 9 | 111 | - | - | - | - | 246 | 4 | - | 42 | 94 | 150 | 36 | - |
| 2025 | 5 | 19 | 13 | 1 | 10 | 84 | 17 | 266 | - | 16 | 36 | 112 | 123 | 12 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 2002 | - | 0.4 | 5.6 | - | - | - | - | 1.1 | 0.0 | - | - | 4.8 | 4.5 | 0.0 | 0.1 |
| 2005 | - | 0.1 | 5.6 | - | - | - | - | 2.6 | - | - | - | 3.9 | 5.0 | 0.0 | 0.2 |
| 2010 | - | 0.1 | 6.3 | - | - | - | - | 1.4 | 0.0 | - | - | 7.7 | 8.1 | 1.3 | 0.0 |
| 2015 | - | - | 5.9 | - | - | - | - | 4.4 | 0.0 | - | 0.4 | 5.3 | 13.2 | 0.0 | - |
| 2020 | - | 0.1 | 4.6 | - | - | - | - | 3.8 | 0.0 | - | 1.6 | 2.1 | 3.8 | 0.6 | - |
| 2025 | 0.1 | 0.6 | 0.2 | 0.0 | 0.0 | 2.4 | 0.7 | 6.7 | - | 0.5 | 0.6 | 2.2 | 3.9 | 0.3 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-34.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Arenaria congesta (ballhead sandwort) | Astragalus miser (timber milkvetch) | Astragalus purshii (woollypod milkvetch) | Castilleja flava (yellow Indian paintbrush) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Delphinium nuttallianum (twolobe larkspur) | Draba[a] (draba) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2002 | 28 | 9 | 8 | 26 | - | - | - | 21 | 30 | 13 | 13 | 2 | - | - | 9 | - | - |
| 2005 | 25 | - | 43 | 37 | - | - | - | 36 | 31 | 36 | 9 | 4 | 53 | - | 12 | 9 | - |
| 2010 | 26 | 5 | 7 | 46 | - | - | - | 20 | 30 | 7 | - | 7 | 45 | - | 6 | - | - |
| 2015 | 5 | - | 60 | 53 | - | - | 5 | 6 | 20 | 32 | 6 | 2 | - | 3 | 23 | 8 | 6 |
| 2020 | - | - | 8 | 53 | - | - | 2 | 25 | 22 | 8 | - | 2 | 12 | 12 | 17 | 2 | - |
| 2025 | 1 | - | 4 | - | 47 | 31 | - | 13 | 29 | 12 | 1 | 4 | 4 | - | 6 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2002 | 0.1 | 0.0 | 0.1 | 0.9 | - | - | - | 0.3 | 0.5 | 0.1 | 0.1 | 0.0 | - | - | 0.1 | - | - |
| 2005 | 0.3 | - | 0.2 | 1.5 | - | - | - | 0.6 | 0.9 | 0.1 | 0.1 | 0.1 | 0.1 | - | 0.1 | 0.0 | - |
| 2010 | 0.4 | 0.0 | 0.0 | 1.9 | - | - | - | 0.2 | 0.9 | 0.0 | - | 0.1 | 0.1 | - | 0.0 | - | - |
| 2015 | 0.0 | - | 0.8 | 2.2 | - | - | 0.1 | 0.0 | 0.6 | 0.3 | 0.0 | 0.2 | - | 0.0 | 0.5 | 0.1 | 0.0 |
| 2020 | - | - | 0.0 | 3.1 | - | - | 0.0 | 0.3 | 0.8 | 0.0 | - | 0.0 | 0.1 | 0.6 | 0.1 | 0.0 | - |
| 2025 | 0.0 | - | 0.0 | - | 2.0 | 2.4 | - | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Hackelia patens (spotted stickseed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lomatium (desertparsley) | Lupinus (lupine) | Lupinus argenteus (silvery lupine) | Microsteris gracilis[a] (slender phlox) | Pedicularis centranthera (dwarf lousewort) | Penstemon caespitosus (mat penstemon) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla (cinquefoil) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2002 | 92 | - | 23 | - | 1 | 4 | 1 | - | - | 43 | 7 | - | 129 | 2 | 129 | 4 | - |
| 2005 | 75 | 3 | 22 | - | - | 12 | 0 | 1 | - | 52 | 4 | - | 71 | - | 144 | 73 | - |
| 2010 | 89 | 2 | 25 | - | - | - | - | - | - | 61 | - | - | 68 | - | 97 | - | - |
| 2015 | 98 | - | 21 | - | 2 | 45 | - | 5 | 17 | 2 | 2 | - | 70 | - | 118 | 2 | 1 |
| 2020 | 62 | 3 | 12 | - | - | 2 | 3 | - | 8 | 29 | 1 | - | 83 | - | 170 | 141 | - |
| 2025 | 60 | - | 20 | 3 | - | 7 | 2 | - | - | 23 | - | 15 | 65 | 3 | 137 | 25 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2002 | 0.7 | - | 0.1 | - | 0.0 | 0.0 | 0.0 | - | - | 0.5 | 0.0 | - | 1.3 | 0.0 | 1.0 | 0.0 | - |
| 2005 | 0.8 | 0.2 | 0.2 | - | - | 0.0 | 0.0 | 0.0 | - | 1.8 | 0.0 | - | 1.6 | - | 1.1 | 0.3 | - |
| 2010 | 0.6 | 0.0 | 0.2 | - | - | - | - | - | - | 1.5 | - | - | 0.9 | - | 0.7 | - | - |
| 2015 | 0.5 | - | 0.2 | - | 0.0 | 0.2 | - | 0.0 | 0.6 | 0.2 | 0.0 | - | 0.8 | - | 0.8 | 0.0 | 0.0 |
| 2020 | 0.4 | 0.1 | 0.2 | - | - | 0.0 | 0.0 | - | 0.8 | 1.0 | 0.0 | - | 1.8 | - | 1.5 | 1.2 | - |
| 2025 | 0.4 | - | 0.1 | 0.0 | - | 0.0 | 0.0 | - | - | 0.3 | - | 0.1 | 1.8 | 0.0 | 0.5 | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Potentilla gracilis (slender cinquefoil) | Ranunculus inamoenus (graceful buttercup) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | unknown perennial forb (unknown forb) | Viola (violet) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 2002 | 2 | - | - | 6 | - | - | - | 54 | 2 | - | 2 | - |
| 2005 | - | - | - | 27 | - | 1 | - | 106 | - | 4 | 1 | 4 |
| 2010 | - | - | 13 | 36 | 5 | - | - | 76 | - | - | - | - |
| 2015 | - | - | - | 48 | - | - | - | 69 | 3 | - | - | 3 |
| 2020 | - | - | - | 39 | - | - | 2 | 52 | 2 | - | - | 4 |
| 2025 | - | 3 | - | - | - | - | 6 | 62 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 2002 | 0.0 | - | - | 0.0 | - | - | - | 0.3 | 0.0 | - | 0.0 | - |
| 2005 | - | - | - | 1.1 | - | 0.0 | - | 2.0 | - | 0.0 | 0.0 | 0.0 |
| 2010 | - | - | 0.1 | 0.4 | 0.0 | - | - | 0.9 | - | - | - | - |
| 2015 | - | - | - | 0.5 | - | - | - | 1.2 | 0.0 | - | - | 0.0 |
| 2020 | - | - | - | 0.7 | - | - | 0.0 | 0.4 | 0.0 | - | - | 0.0 |
| 2025 | - | 0.0 | - | - | - | - | 0.0 | 0.4 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-34.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Purshia tridentata[p] (antelope bitterbrush) | Quercus gambelii[p] (Gambel oak) | Sclerocactus (fishhook cactus) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 2002 | 1.1 | 26.1 | 1.1 | - | 0.6 | - | 5 | - | - | 8.5 | 0.1 |
| 2005 | 0.4 | 24.2 | 0.9 | - | 0.4 | - | 3.2 | - | - | 7.7 | 0.1 |
| 2010 | 0.2 | 30.4 | 1.2 | - | 0.8 | - | 4.3 | - | - | 9.6 | - |
| 2015 | 0 | 27.9 | 1.4 | - | 0.9 | - | 4.4 | - | - | 6.7 | - |
| 2020 | 0.8 | 33.7 | 1.9 | - | 0.4 | 0 | 3.6 | - | - | 9.6 | - |
| 2025 | 0.3 | 29.2 | 2.6 | - | 0.2 | - | 4.3 | - | - | 7.1 | - |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 2002 | 0.4 | 22.5 | 0.8 | 0.0 | 0.8 | - | 2.8 | - | - | 8.1 | 0.0 |
| 2005 | 0.5 | 21.0 | 0.4 | 0.0 | 0.7 | - | 2.9 | - | 0.1 | 6.7 | 0.0 |
| 2010 | 0.1 | 21.5 | 0.4 | 0.0 | 0.4 | - | 1.8 | - | - | 5.8 | 0.0 |
| 2015 | 0.0 | 17.8 | 0.9 | 0.0 | 0.5 | - | 2.3 | - | - | 6.2 | - |
| 2020 | 0.1 | 22.5 | 1.2 | - | 0.3 | 0.0 | 2.2 | - | - | 8.0 | - |
| 2025 | 0.1 | 18.4 | 1.8 | - | 0.2 | - | 1.9 | 0.0 | - | 7.4 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-34.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2002 | 1220 | 20 | 66 | 20 | 15 | 16 | 28 | 3 | 106/82 |
| 2005 | 1220 | 20 | 44 | 49 | 7 | 12 | 28 | 3 | 64/56 |
| 2010 | 780 | 100 | 72 | 26 | 3 | 8 | 5 | 3 | 68/48 |
| 2015 | 160 | - | 63 | 25 | 13 | 38 | 13 | 38 | 37/23 |
| 2020 | 520 | - | 69 | 27 | 4 | 8 | 12 | 4 | 82/60 |
| 2025 | 540 | - | 70 | 30 | 0 | 22 | 67 | 7 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2002 | 4180 | 240 | 7 | 61 | 32 | 14 | 2 | 8 | 79/96 |
| 2005 | 3940 | 40 | 7 | 56 | 38 | 17 | 3 | 22 | 77/95 |
| 2010 | 3900 | - | 6 | 79 | 16 | 23 | 11 | 25 | 81/109 |
| 2015 | 3580 | 20 | 8 | 74 | 18 | 48 | 35 | 40 | 69/89 |
| 2020 | 3340 | 120 | 7 | 69 | 25 | 16 | 8 | 26 | 86/116 |
| 2025 | 3820 | 60 | 16 | 61 | 23 | 6 | 25 | 23 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2002 | 480 | 20 | 46 | 46 | 8 | 33 | 33 | 8 | 122/80 |
| 2005 | 480 | - | 8 | 67 | 25 | 17 | 71 | 21 | 143/125 |
| 2010 | 500 | 80 | 48 | 48 | 4 | 16 | 40 | 0 | 99/78 |
| 2015 | 360 | - | 17 | 56 | 28 | 17 | 56 | 39 | 76/60 |
| 2020 | 340 | - | 0 | 47 | 53 | 6 | 53 | 53 | 121/96 |
| 2025 | 380 | 60 | 26 | 74 | 0 | 0 | 100 | 5 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 2002 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/8 |
| 2005 | 80 | - | 0 | 75 | 25 | 25 | 25 | 0 | - / - |
| 2010 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 11/21 |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 50 | 5/10 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2002 | 1300 | - | 11 | 75 | 14 | 5 | 0 | 5 | 33/39 |
| 2005 | 580 | - | 7 | 93 | 0 | 3 | 0 | 0 | 38/47 |
| 2010 | 260 | - | 8 | 92 | 0 | 8 | 0 | 0 | 40/45 |
| 2015 | 580 | 20 | 21 | 79 | 0 | 24 | 0 | 14 | 29/28 |
| 2020 | 420 | - | 5 | 95 | 0 | 14 | 0 | 0 | 27/29 |
| 2025 | 360 | - | 17 | 83 | 0 | 0 | 39 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Peraphyllum ramosissimum[P] -- (wild crab apple) | | | | | | | | | |
| 2002 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 28/22 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 2002 | 1840 | - | 22 | 72 | 7 | 14 | 69 | 1 | 34/64 |
| 2005 | 1820 | - | 2 | 89 | 9 | 7 | 56 | 2 | 23/46 |
| 2010 | 1760 | - | 8 | 92 | 0 | 5 | 88 | 0 | 26/50 |
| 2015 | 1220 | 20 | 2 | 98 | 0 | 7 | 84 | 15 | 27/53 |
| 2020 | 1120 | - | 2 | 91 | 7 | 2 | 89 | 25 | 29/50 |
| 2025 | 1280 | 40 | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Quercus gambelii[P] -- (Gambel oak) | | | | | | | | | |
| 2002 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 194/91 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 412/254 |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[P] -- (mountain snowberry) | | | | | | | | | |
| 2002 | 3340 | - | 15 | 83 | 2 | 5 | 8 | 1 | 40/66 |
| 2005 | 5920 | 20 | 26 | 73 | 1 | 8 | 0 | 1 | 38/56 |
| 2010 | 4220 | 260 | 46 | 54 | 0 | 6 | 4 | 0 | 40/58 |
| 2015 | 5800 | 300 | 36 | 64 | 0 | 42 | 2 | 1 | 35/51 |
| 2020 | 4040 | - | 7 | 93 | 0 | 13 | 0 | 0 | 37/49 |
| 2025 | 5240 | 40 | 32 | 68 | 0 | 24 | 40 | 0 | - / - |

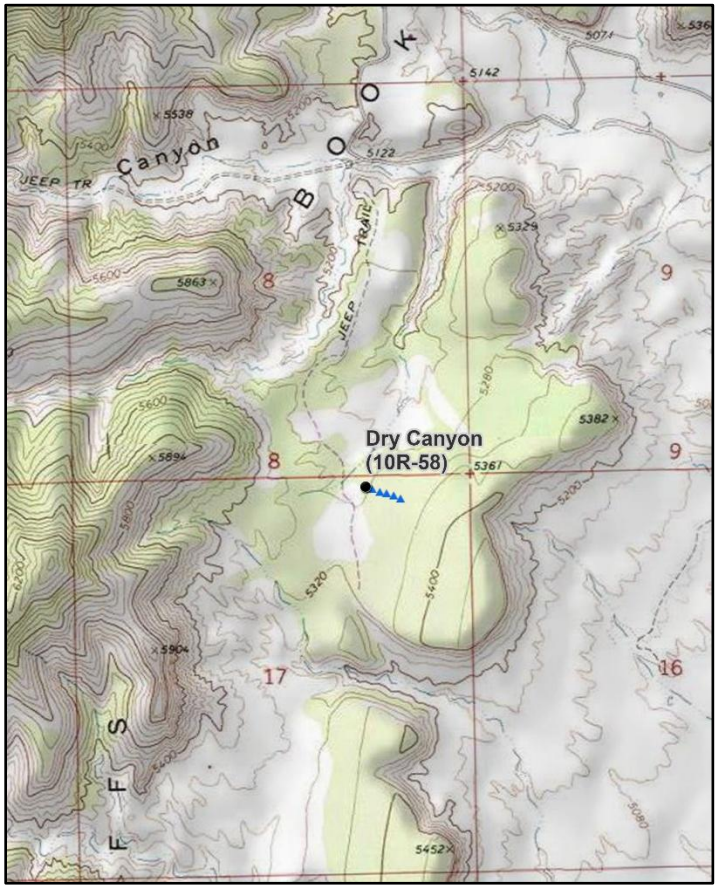
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2002 | 60 | - | 33 | 67 | 0 | 33 | 0 | 0 | 20/21 |
| 2005 | 40 | - | 50 | 0 | 50 | 50 | 0 | 50 | 10/15 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/12 |
| 2015 | - | - | - | - | - | - | - | - | 18/24 |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

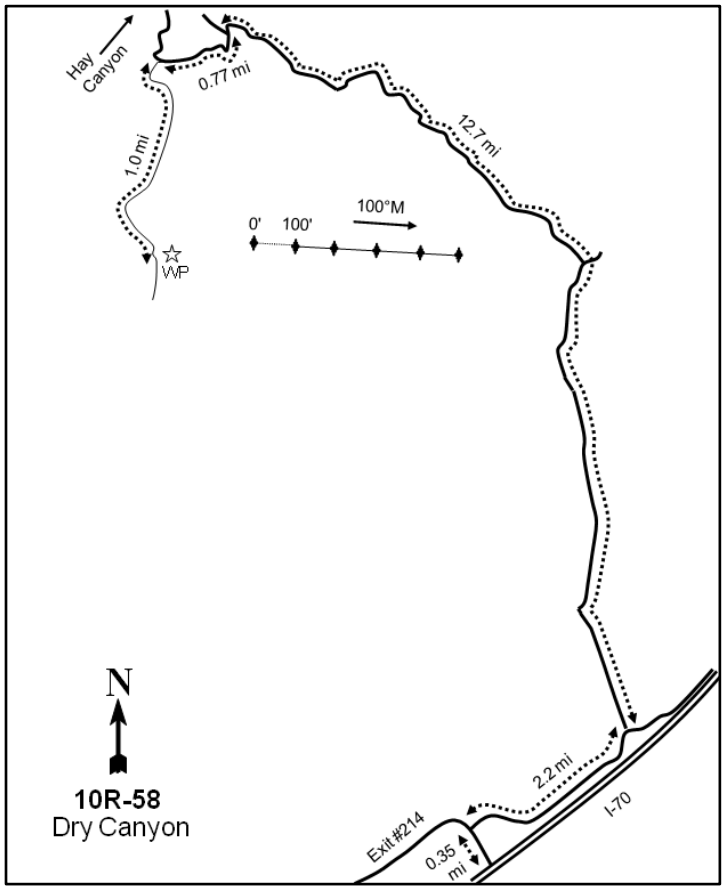
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-34.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2015 | 1 | - | - | - | - | 100 | 24.0 |
| 2020 | 4 | - | 25 | 50 | 25 | - | 6.5 |
| 2025 | 4 | - | 33 | 67 | - | - | 5.3 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2015 | 3 | - | - | 100 | - | - | 10.5 |
| 2020 | 3 | - | - | 100 | - | - | 7.5 |
| 2025 | 2 | - | - | 100 | - | - | 1.0 |

# DRY CANYON - STUDY NO. 10R-58




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Antone Canyon NE; Township 18S, Range 24E, Section 17 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 648488 East 4345710 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 101 |
| Transect Bearing | 100° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Belt 4: 3ft |

## Directions to Site

From I-70, take the US-6/Old Highway Harley Dome exit and travel for 2.2 miles to Book Cliff Ridge Road (Hay Canyon) and turn left (north). Travel for 11.2 miles to a jeep trail that crosses the wash, then turn left again. Follow the jeep trail for 1.0 mile to the top of a flat and park: there is no witness post. Use a GPS unit to navigate to the 0-foot baseline stake which is marked by browse tag #101.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | CORRAL WASH CANYON |
| Elevation | 5,300ft (1,615m) |
| Aspect | West |
| Slope | 5% |
| Sample Dates | 09/02/2015, 07/29/2019, 08/13/2024, 06/03/2025 |

**Table 10R-58.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial Before | South Bookcliffs Vegetation Improvement (Hay) Phase III | 3330 | March 2016 | 322 |
| Herbicide - Imazapic | South Bookcliffs Phase 9 (Cottonwood/San Arroyo Bullhog) | 5654 | November 2021 | 2711 |
| Mechanical - Bullhog | South Bookcliffs Vegetation Improvement (Hay) Phase III | 3330 | March-May 2016 | 322 |

**Table 10R-58.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Hay Canyon | | | Aerial | Dec 2015 | 322 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | White River | 1.00 | 0.94 |
| G | Elymus lanceolatus | Thickspike Wheatgrass | Bannock | 0.50 | 0.47 |
| G | Poa secunda | Sandberg Bluegrass | UP/Colorado Plateau | 0.50 | 0.38 |
| F | Achillea millefolium | Western Yarrow | Lincoln WA | 0.10 | 0.09 |
| F | Cleome serrulata | Rocky Mountain Beeplant | | 0.54 | 0.35 |
| F | Cleome serrulata | Rocky Mountain Beeplant | Sanpete UT | 0.47 | 0.40 |
| F | Helianthus annuus | Annual Sunflower | Box Elder UT | 0.50 | 0.40 |
| F | Linum perenne | Blue Flax | Appar | 0.86 | 0.68 |
| F | Linum perenne | Blue Flax | Appar | 0.14 | 0.12 |
| F | Medicago sativa | Alfalfa | Ladak + | 1.00 | 0.93 |
| F | Onobrychis viciifolia | Sainfoin | Eski | 1.00 | 0.97 |
| F | Penstemon palmeri | Palmer Penstemon | Carbon/Emery UT | 0.20 | 0.18 |
| F | Sanguisorba minor | Small Burnet | | 1.00 | 0.83 |
| S | Atriplex canescens | Fourwing Saltbush | Emery UT | 1.00 | 0.43 |
| S | Krascheninnikovia lanata | Winterfat | Millard UT | 0.50 | 0.36 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Hay Canyon Sagebrush | | | Aerial | Mar 2016 | 322 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| | | Rice Hulls | | 0.62 | 0.00 |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | Paiute/Wayne/Sevier | 0.62 | 0.12 |

## Wildlife Habitat and Vegetation History

**Table 10R-58.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | substantial | winter |
| Pronghorn | crucial | year-long |

**Table 10R-58.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2015 | Pinyon-Juniper | Phase III |
| 2019 | Broom Snakeweed | Early Phase I |
| 2024 | Mountain Big Sagebrush/Broom Snakeweed/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush/Broom Snakeweed | Early Phase I |

## Site Notes

No Notes

### Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Shallow Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY225UT |
| States and Transitions | 2015 - Juniper Invasion State: Community Phase 3.2<br>2019 - Invasive Annual State: Community Phase 4.1<br>2024-2025 - Current Potential State: Community Phase 2.2 |

Upon study establishment in 2015, this site was dominated by Utah juniper (*Juniperus osteosperma*) with a lesser component of twoneedle pinyon (*Pinus edulis*) and was considered to be in Phase III of woodland succession (Table 10R-58.4). The shrub component was fairly limited, but broom snakeweed (*Gutierrezia sarothrae*) provided moderate amounts of cover. The herbaceous

understory was depauperate in both diversity and abundance. A bullhog and seeding treatment in the winter of 2015-2016 (Table 10R-58.1) removed most of the trees, causing the site to transition to one dominated by broom snakeweed in 2019. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) increased in density and cover in recent sample years and became a co-dominant vegetation component in 2024. Furthermore, sagebrush decadence has decreased following treatment while recruitment of young has increased (Table 10R-58.12, Table 10R-58.13, Table 10R-58.14). The herbaceous component has diversified and increased following treatment. The introduced annual grass cheatgrass (*Bromus tectorum*) and a variety of annual forbs contributed a majority of the cover in 2019, but annual forb cover decreased in subsequent years. Cover of native perennial grasses -- namely squirreltail (*Elymus elymoides*) -- increased in 2024, and they were considered to be co-dominant with sagebrush and broom snakeweed in that year. However, perennial grass cover decreased in 2025 (Table 10R-58.7, Table 10R-58.10, Table 10R-58.11). The continued presence of trees indicates that there may be potential for infilling in future sample years. However, the site has remained within Early Phase I of woodland succession since 2019 (Table 10R-58.4), suggesting that infilling is likely not an immediate concern.

Condition of deer winter range on this site has varied between very poor and poor since 2015; deer winter habitat condition is considered to be very poor-poor as of 2025. The main factors negatively affecting winter range condition include a lack of preferred browse cover, reduced perennial grass and forb cover, and the amount of cheatgrass cover (Table 10R-58.6, Table 10R-58.7, Table 10R-58.10, Table 10R-58.15). Pellet transect data indicates that deer presence was low prior to treatment, high in 2019 and 2025, and was moderate in 2024. During the 2024/25 winter season the area had infrequent occurrences of collared elk (Wildlife Migration Initiative). Fifty five percent or more of sagebrush plants sampled in density strips were moderately to heavily hedged in 2015 and 2019; in 2025, 60% of sagebrush plants were moderately browsed and 36% were heavily hedged. In general, sagebrush plants have decreased in decadence over the sample years (Photos, Table 10R-58.9, Table 10R-58.13). On-site observations for 2025 noted little to no utilization on herbaceous species.

## Trend Summary Tables

**Table 10R-58.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2015 | 1.9 | 6.6 | 6.4 | 3.9 | 11.8 | 26.4 |
| 2019 | 2.3 | 14.9 | 0.0 | 2.3 | 27.5 | - |
| 2024 | 2.8 | 8.2 | 0.1 | 3.1 | 7.8 | - |
| 2025 | 3.6 | 6.3 | 0.1 | 3.2 | 5.7 | - |

**Table 10R-58.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2015 | 69 | 2 | 23 | 27 | 0.2 | 0.0 | 0.1 | 0.1 |
| 2019 | 141 | 28 | 198 | 98 | 5.6 | 0.8 | 5.0 | 2.9 |
| 2024 | 216 | 162 | 29 | 6 | 5.7 | 7.3 | 0.2 | 0.2 |
| 2025 | 100 | 149 | 8 | 26 | 0.9 | 3.0 | 0.0 | 0.3 |

**Table 10R-58.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2015 | 42.2 | 3.1 | 34.8 | 7.7 | 11.0 | 14.8 |
| 2019 | 17.4 | 0.5 | 64.3 | 3.0 | 5.0 | 27.1 |
| 2024 | 17.8 | 0.8 | 60.4 | 5.1 | 6.3 | 23.6 |
| 2025 | 20.3 | 1.1 | 64.0 | 3.0 | 5.2 | 14.2 |

**Table 10R-58.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2015 | - | 12 | 1 | 23 |
| 2019 | - | 23 | - | 13 |
| 2024 | - | 47 | 6 | 15 |
| 2025 | - | 32 | 3 | 22 |
| Year | Days Use Per Acre (ha) | | | |
| 2015 | - | 9.4 (23.2) | 0.7 (1.7) | - |
| 2019 | 0.7 (1.8) | 51.6 (127.5) | - | - |
| 2024 | 0.7 (1.8) | 36.8 (91.0) | - | - |
| 2025 | 4.4 (10.8) | 50.9 (125.8) | 13.4 (33.1) | - |

**Table 10R-58.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Poa secunda (Sandberg bluegrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 2015 | - | 69 | 2 | - | - | 3 |
| 2019 | 1 | 141 | 27 | - | 0 | - |
| 2024 | 32 | 216 | 122 | 1 | 13 | - |
| 2025 | 3 | 100 | 143 | 5 | 5 | - |
| year | Average Cover (%) | | | | | |
| 2015 | - | 0.2 | 0.0 | - | - | 0.0 |
| 2019 | 0.0 | 5.6 | 0.8 | - | 0.0 | - |
| 2024 | 0.9 | 5.7 | 5.9 | 0.1 | 0.3 | - |
| 2025 | 0.1 | 0.9 | 2.8 | 0.0 | 0.0 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 10R-58.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Alyssum desertorum[ai] (desert madwort) | Astragalus chamaeleuce (cicada milkvetch) | Chaetopappa ericoides (rose heath) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Linum perenne[i] (blue flax) | Lithospermum incisum (narrowleaf stoneseed) | Mentzelia albicaulis[a] (whitestem blazingstar) | Microsteris gracilis[a] (slender phlox) | Mirabilis multiflora (Colorado four o'clock) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2015 | - | 5 | - | - | - | 3 | 17 | - | 3 | - | 9 | - | - | - | - | - | - |
| 2019 | 1 | 8 | 2 | - | 21 | 12 | 52 | 74 | 16 | 103 | 22 | 3 | 3 | 4 | 14 | 3 | 0 |
| 2024 | 2 | 7 | - | - | 4 | - | 4 | - | - | 1 | 10 | - | - | - | - | 3 | - |
| 2025 | 1 | - | - | 8 | - | - | - | - | - | - | 5 | - | - | 1 | - | - | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2015 | - | 0.0 | - | - | - | 0.0 | 0.1 | - | 0.0 | - | 0.0 | - | - | - | - | - | - |
| 2019 | 0.0 | 0.3 | 0.0 | - | 0.1 | 0.1 | 1.4 | 0.5 | 0.0 | 2.3 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 |
| 2024 | 0.1 | 0.0 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.1 | - | - | - | - | 0.0 | - |
| 2025 | 0.0 | - | - | 0.2 | - | - | - | - | - | - | 0.0 | - | - | 0.0 | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Orobanche fasciculata (clustered broomrape) | Phlox longifolia (longleaf phlox) | Salsola tragus[ai] (prickly Russian thistle) | Sanguisorba minor[i] (small burnet) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea grossulariifolia (gooseberryleaf globemallow) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 2015 | - | 2 | - | - | - | 5 | 17 |
| 2019 | 45 | - | - | 0 | 19 | - | 24 |
| 2024 | - | - | 2 | - | 3 | - | 1 |
| 2025 | - | - | 3 | - | 13 | - | 1 |
| year | Average Cover (%) | | | | | | |
| 2015 | - | 0.0 | - | - | - | 0.0 | 0.1 |
| 2019 | 1.5 | - | - | 0.0 | 0.7 | - | 0.4 |
| 2024 | - | - | 0.0 | - | 0.0 | - | 0.0 |
| 2025 | - | - | 0.0 | - | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 10R-58.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Bassia prostrata[pi] (forage kochia) | Ephedra viridis[p] (mormon tea) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Yucca (yucca) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 2015 | 3.7 | - | 0.2 | - | 10.1 | 21.1 | 1 | 5.3 | 0.7 |
| 2019 | 2 | - | 0.3 | - | 26.1 | - | 1.4 | - | - |
| 2024 | 2.8 | - | 0.3 | - | 7.1 | - | 0.7 | - | - |
| 2025 | 3.1 | - | 0.1 | - | 5.3 | - | 0.4 | - | 0 |
| year | Quadrat Cover (%) | | | | | | | | |
| 2015 | 1.7 | 0.0 | 0.1 | - | 5.6 | 5.0 | 0.8 | 1.4 | 0.2 |
| 2019 | 1.9 | - | 0.4 | - | 13.9 | 0.0 | 1.0 | 0.0 | - |
| 2024 | 2.7 | - | 0.1 | - | 7.5 | 0.0 | 0.6 | 0.0 | - |
| 2025 | 3.2 | - | 0.4 | 0.0 | 5.6 | 0.1 | 0.7 | 0.0 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 10R-58.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2015 | 620 | - | 13 | 32 | 55 | 42 | 13 | 58 | 51/92 |
| 2019 | 560 | 560 | 11 | 71 | 18 | 32 | 29 | 43 | 51/71 |
| 2024 | 1040 | - | 21 | 77 | 2 | 14 | 35 | 2 | - / - |
| 2025 | 1100 | - | 31 | 66 | 4 | 60 | 26 | 4 | - / - |
| Echinocereus coccineus -- (scarlet hedgehog cactus) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 6/14 |
| 2019 | - | - | - | - | - | - | - | - | -/- |
| 2024 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ephedra viridis[p] -- (mormon tea) | | | | | | | | | |
| 2015 | 40 | - | 0 | 50 | 50 | 0 | 50 | 50 | 43/45 |
| 2019 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 44/38 |
| 2024 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 33 | 67 | 0 | 0 | 67 | 0 | - / - |
| Eriogonum microthecum[p] -- (slender buckwheat) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2019 | - | - | - | - | - | - | - | - | 12/7 |
| 2024 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | 20 | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2015 | 15120 | 40 | 31 | 68 | 1 | 0 | 0 | 1 | 24/29 |
| 2019 | 9400 | 2640 | 12 | 82 | 6 | 0 | 0 | 7 | 35/53 |
| 2024 | 6440 | 20 | 15 | 77 | 8 | 0 | 0 | 8 | - / - |
| 2025 | 6460 | 20 | 4 | 86 | 10 | 0 | 0 | 10 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2015 | 120 | - | 33 | 50 | 17 | 0 | 0 | 17 | - / - |
| 2019 | - | 60 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2024 | 260 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 320 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2015 | 600 | 20 | 3 | 80 | 17 | 3 | 0 | 17 | 11/43 |
| 2019 | 680 | - | 0 | 100 | 0 | 0 | 0 | 3 | 11/27 |
| 2024 | 680 | - | 3 | 74 | 24 | 0 | 0 | 24 | - / - |
| 2025 | 440 | - | 0 | 86 | 14 | 0 | 0 | 14 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 2015 | 20 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2019 | - | 340 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2024 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| Yucca -- (yucca) | | | | | | | | | |
| 2015 | 280 | - | 7 | 71 | 21 | 0 | 0 | 14 | 27/52 |
| 2019 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/33 |
| 2024 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

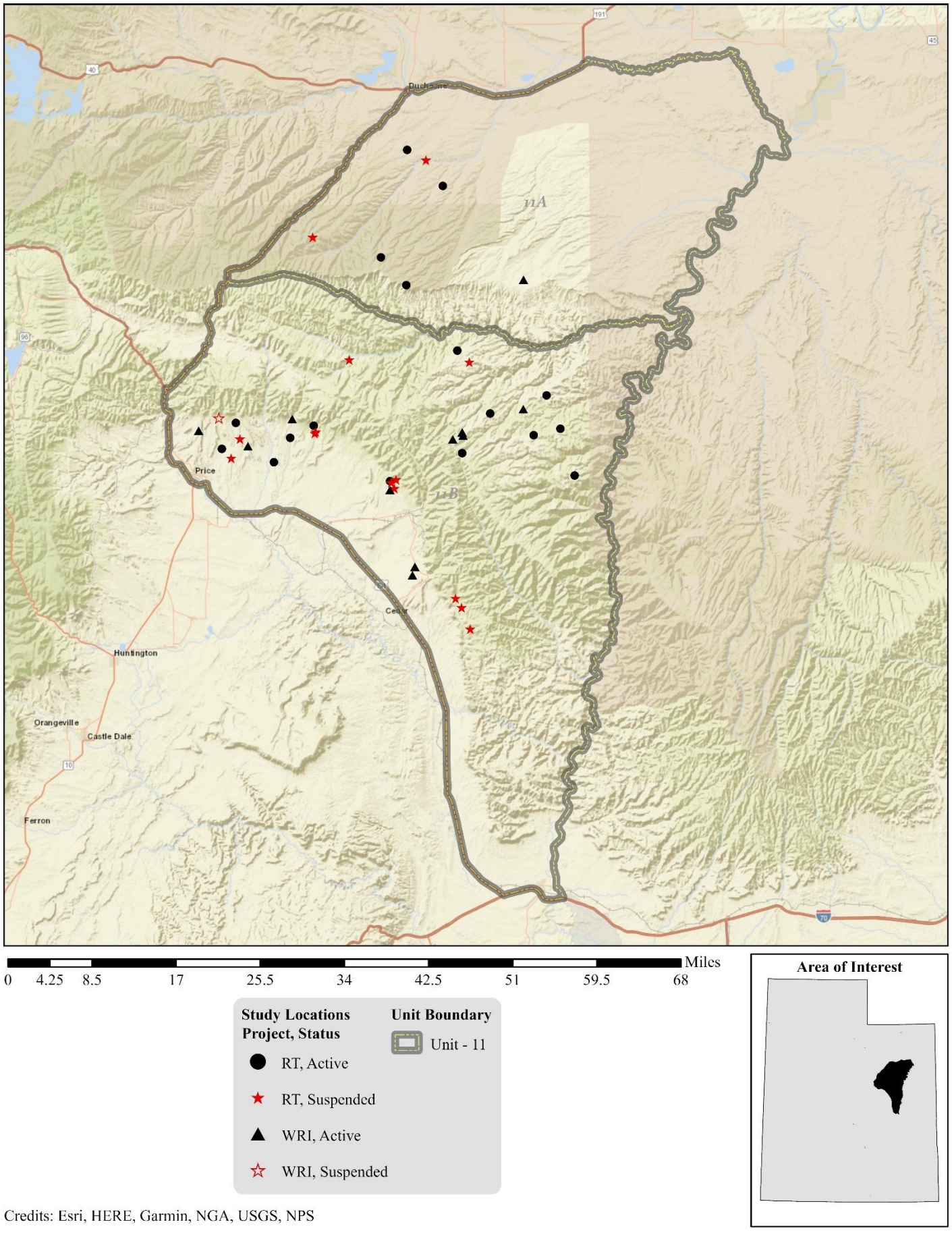
**Table 10R-58.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 186 | - | 10 | - | 50 | 40 | 23.4 |
| 2019 | 14 | - | 100 | - | - | - | 4.0 |
| 2024 | 51 | 31 | 69 | - | - | - | 5.4 |
| 2025 | 94 | 63 | 37 | - | - | - | 3.1 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 32 | - | 17 | 17 | 8 | 58 | 15.4 |
| 2019 | 4 | 25 | 75 | - | - | - | 2.3 |
| 2024 | 6 | 20 | 80 | - | - | - | 2.6 |
| 2025 | 3 | - | 100 | - | - | - | 3.0 |

**Table 10R-58.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

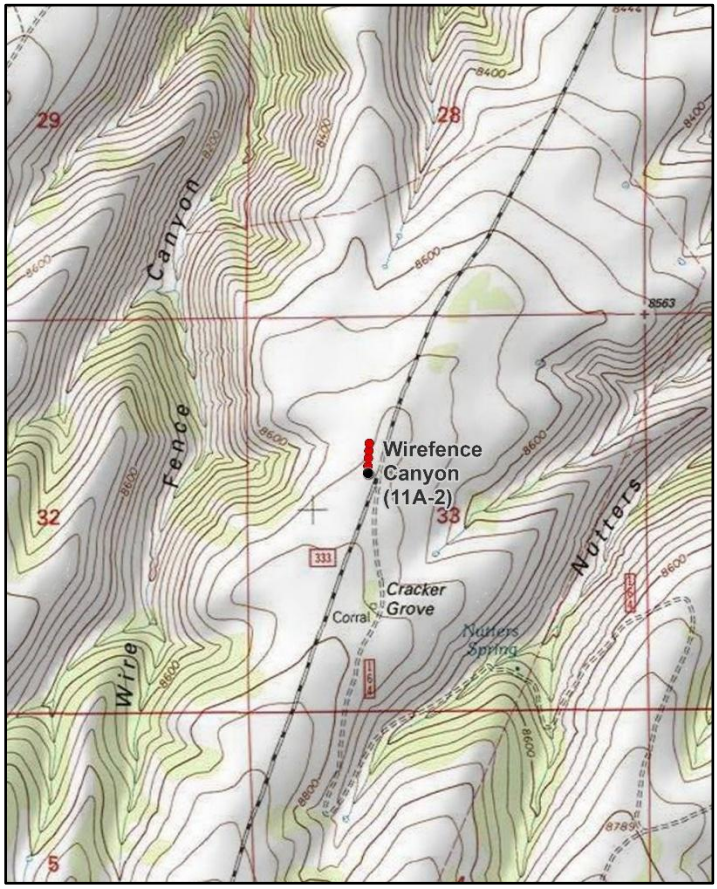
| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2015 | 4.9 | 0.0 | 0.0 | 0.0 | -0.2 | 0.2 | 0.0 | **4.9** | Very Poor |
| 2019 | 2.9 | 0.0 | 0.0 | 1.6 | -4.2 | 5.9 | 0.0 | **6.2** | Very Poor |
| 2024 | 3.9 | 0.0 | 0.0 | 14.6 | -4.3 | 0.3 | 0.0 | **14.5** | Poor |
| 2025 | 4.0 | 0.0 | 0.0 | 5.9 | -0.7 | 0.6 | 0.0 | **9.8** | Very Poor-Poor |

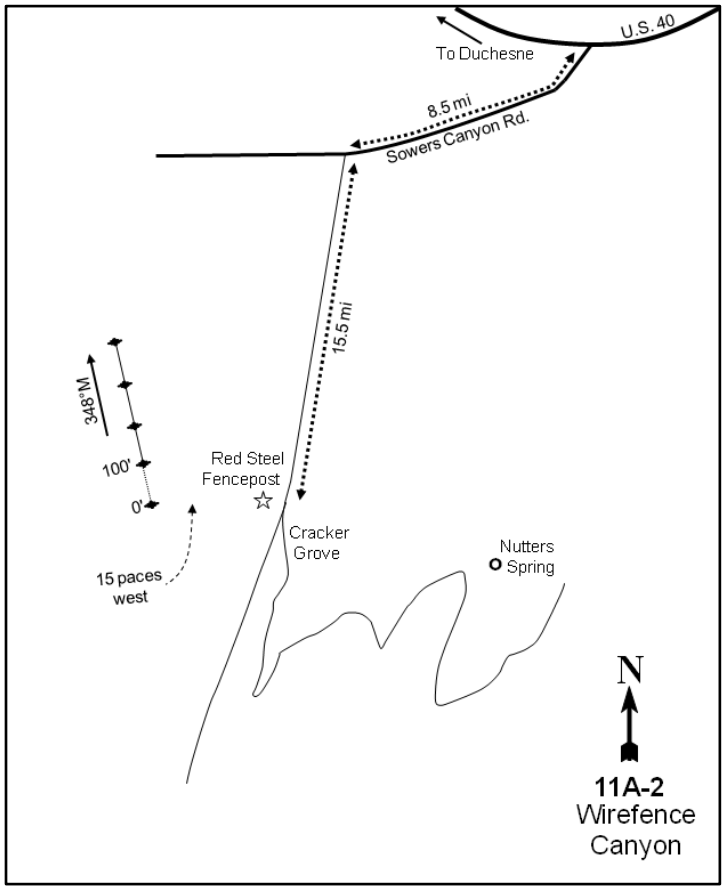
# WILDLIFE MANAGEMENT UNIT 11 – NINE MILE




Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# WIREFENCE CANYON - STUDY NO. 11A-2




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Anthro Mountain SW; Township 6S, Range 5W, Section 33 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 546461 East 4418780 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9145 |
| Transect Bearing | 348° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (16ft & 86ft), Line 2 (33ft), Line 3 (52ft), Line 4 (66ft) |
| Belt Marker Placement | Belt 3: 2ft, Belt 5: 2ft |

## Directions to Site

Driving from the junction of Highway U.S. 40 and 12000 West (near Bridgeland), continue south on Antelope Canyon Road (which will turn into Sowers Canyon Road) for 8.5 miles to Nutters Ridge Road. Turn left by an old ranch and proceed south along Nutters Ridge for 15.5 miles to a narrow "Y" in the road. The red witness post is six paces west of the fork. The 0-foot baseline stake is 15 paces west of the red fence post and is marked by browse tag #9145.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | ANTHRO MOUNTAIN |
| Elevation | 8,700ft (2,652m) |
| Aspect | West |
| Slope | 3-5% |
| Sample Dates | 07/12/1995, 07/12/2000, 07/06/2005, 07/13/2010, 07/15/2015, 07/07/2020, 07/16/2025 |

**Table 11A-02.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Mechanical - Plow | - | - | 1958-1959 | 2363 |
| Seeding - Seed Unknown | - | - | 1958-1959 | 2363 |

## Wildlife Habitat and Vegetation History

**Table 11A-02.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | crucial | year-long |

**Table 11A-02.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Perennial Grass/Mountain Big Sagebrush | NA |
| 1988 | Perennial Grass/Mountain Big Sagebrush | NA |
| 1995 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2000 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2005 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2010 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2015 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2020 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2025 | Perennial Grass/Mountain Big Sagebrush | NA |

## Site Notes

This study is located immediately adjacent to an old permanent line-intercept study established in 1977 and is intended to replace it. After decades of season-long grazing by cattle and sheep from 1915 to 1944, a summer rest rotation grazing system was established in 1972. In the fall of 2007 the area was treated with a prescribed fire (WRI Project #841), although the transect appears to have not been burned.

## Soils

**Table 11A-02.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.2 | 43.4 | 33.0 | 23.6 | 4.4 | 5.0 | 96.0 | 0.8 | 07/12/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 22 inches |
| NRCS Ecological Site | Mountain Shallow Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY436UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush Super-Dominance State: Community Phase 3.1 |

Since study establishment in 1982, this site has remained dominated by perennial grasses and scattered shrubs, namely mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) (Photos, Pre-1992 Data, Table 11A-02.6). In addition, shrub cover has generally increased over time (Table 11A-02.12). The herbaceous understory has remained diverse throughout the study period. Perennial grass cover has been variable, but the trend overall appears to be stable and mainly driven by the introduced perennial grass species smooth brome (*Bromus inermis*) (Table 11A-02.10). This site will likely remain in this or a similar state in future sample years without a major disturbance.

Although species are diverse, cover of grasses and forbs on this site appears limited in the context of forage for summering mule deer. Pellet transect data indicates that deer and elk presence has remained low in most sample years, but mule deer presence was moderate in 2005. During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife Migration Initiative). Cattle presence was high in most sample years, but cattle pats were not observed in 2015. Utilization of mountain big sagebrush generally transitioned from moderate to heavy; combined moderated and heavy utilization reached 99% in 2025. Spineless horsebrush (*Tetradymia canescens*) followed a similar trend over time, but not to the same magnitude (Table 11A-02.13). On-site observations state that there was light utilization (10-20%) on crested wheatgrass (*Agropyron cristatum*) and prairie Junegrass (*Koeleria macrantha*) in the most recent sample year (2025) (Photos, Table 11A-02.9, Table 11A-02.10, Table 11A-02.11). The herbaceous and browse communities appeared to be drought-affected as indicated by poor vigor and limited primary production.

## Trend Summary Tables

**Table 11A-02.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 8.1 | 3.4 | - | - | - | - |
| 2000 | 6.4 | 2.9 | - | - | - | - |
| 2005 | 4.5 | 4.0 | - | 4.8 | 4.3 | - |
| 2010 | 2.4 | 4.3 | - | 3.8 | 5.4 | - |
| 2015 | 4.6 | 6.0 | - | 5.3 | 6.9 | - |
| 2020 | 7.2 | 8.8 | - | 6.5 | 8.8 | - |
| 2025 | 5.4 | 4.6 | - | 6.1 | 4.1 | - |

**Table 11A-02.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 432 | 37 | 321 | - | 15.0 | 0.1 | 10.2 |
| 2000 | - | 429 | 8 | 257 | - | 24.0 | 0.0 | 8.9 |
| 2005 | - | 432 | 13 | 260 | - | 23.2 | 0.1 | 10.5 |
| 2010 | - | 409 | 8 | 193 | - | 19.2 | 0.0 | 5.9 |
| 2015 | - | 446 | 48 | 263 | - | 34.7 | 0.6 | 13.0 |
| 2020 | - | 445 | 5 | 177 | - | 29.3 | 0.0 | 5.5 |
| 2025 | - | 433 | - | 203 | - | 21.6 | - | 3.1 |

**Table 11A-02.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 31.8 | 0.2 | 34.0 | 3.1 | 3.2 | 35.7 |
| 2000 | 36.9 | 0.1 | 40.1 | 5.5 | 2.9 | 48.0 |
| 2005 | 38.4 | 0.0 | 22.9 | 5.6 | 3.9 | 39.5 |
| 2010 | 26.1 | 0.4 | 39.8 | 5.8 | 2.4 | 37.5 |
| 2015 | 38.0 | 0.1 | 36.6 | 4.1 | 3.6 | 49.0 |
| 2020 | 22.6 | 0.0 | 43.5 | 4.7 | 5.3 | 54.5 |
| 2025 | 36.1 | 0.0 | 34.8 | 5.4 | 4.2 | 37.2 |

**Table 11A-02.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 1 | 1 | 15 | - | 6 |
| 2000 | 12 | 6 | 10 | - | 10 |
| 2005 | 12 | 19 | 22 | 1 | 41 |
| 2010 | 13 | 6 | 8 | - | 9 |
| 2015 | 6 | 1 | 5 | - | 5 |
| 2020 | 13 | 7 | - | - | 2 |
| 2025 | 13 | 15 | 2 | - | 2 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 52.3 (129.1) | 2.0 (5.0) | 18.1 (44.7) | 43.6 (107.6)* | - |
| 2005 | 41.4 (102.2) | 34.2 (84.4) | 6.7 (16.6) | 34.9 (86.1)* | - |
| 2010 | 42.8 (105.8) | 14.1 (34.8) | 14.1 (34.8) | - | - |
| 2015 | - | 6.7 (16.6) | 4.7 (11.6) | - | - |
| 2020 | 20.3 (50.2) | 2.7 (6.6) | - | - | - |
| 2025 | 55.2 (136.3) | 10.0 (24.8) | 9.4 (23.2) | 17.4 (43.0)* | - |

*Pellets per acre (ha)

**Table 11A-02.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Koeleria macrantha (prairie Junegrass) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 36 | 416 | - | - | 49 | 56 | 58 | 68 | 42 | - | 3 |
| 2000 | 22 | 408 | - | - | 75 | 30 | 4 | 132 | 40 | 14 | 9 |
| 2005 | 41 | 416 | - | - | 39 | 75 | 73 | 85 | 23 | 15 | 8 |
| 2010 | 30 | 386 | - | - | 11 | 52 | 22 | 91 | 53 | 15 | 19 |
| 2015 | 34 | 432 | 2 | 12 | 103 | 84 | 33 | 93 | 74 | 8 | 28 |
| 2020 | 34 | 423 | - | 16 | 130 | 44 | 10 | 89 | 89 | 2 | 1 |
| 2025 | 37 | 411 | - | 35 | 50 | 62 | 26 | 4 | 128 | - | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 1.0 | 9.8 | - | - | 0.6 | 0.7 | 0.7 | 1.5 | 0.6 | - | 0.0 |
| 2000 | 1.1 | 16.7 | - | - | 1.3 | 0.7 | 0.2 | 3.0 | 0.4 | 0.6 | 0.2 |
| 2005 | 1.7 | 14.7 | - | - | 0.4 | 2.0 | 0.8 | 2.3 | 0.5 | 0.8 | 0.1 |
| 2010 | 1.1 | 13.1 | - | - | 0.2 | 1.2 | 0.3 | 2.0 | 0.7 | 0.4 | 0.1 |
| 2015 | 2.1 | 22.5 | 0.0 | 0.2 | 1.9 | 2.0 | 0.9 | 2.2 | 2.3 | 0.1 | 0.5 |
| 2020 | 0.7 | 18.9 | - | 0.4 | 2.7 | 0.8 | 0.7 | 1.6 | 3.5 | 0.0 | 0.0 |
| 2025 | 1.5 | 14.4 | - | 0.1 | 1.0 | 1.1 | 1.3 | 0.2 | 2.0 | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11A-02.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria (pussytoes) | Arabis drummondii (Drummond's rockcress) | Astragalus argophyllus (silverleaf milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus detritalis (debris milkvetch) | Astragalus tenellus (looseflower milkvetch) | Castilleja flava (yellow Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chorispora tenella[ai] (crossflower) | Cryptantha[a] (annual cryptantha) | Cymopterus longipes (longstalk springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 2 | 3 | 35 | - | 21 | 24 | 12 | 7 | 105 | 14 | 10 | - | - | 125 | 3 | 32 | 0 |
| 2000 | - | - | 8 | - | 1 | 36 | 4 | - | 180 | 5 | - | - | - | 34 | - | 8 | - |
| 2005 | - | 2 | 9 | - | 9 | 12 | 17 | - | 138 | 7 | 1 | - | - | 87 | 2 | 42 | - |
| 2010 | - | - | 5 | - | - | 21 | 2 | - | 106 | - | - | - | - | 13 | 3 | 21 | 3 |
| 2015 | - | 3 | 43 | 3 | 8 | 12 | 10 | 3 | 167 | 5 | 5 | 2 | - | 5 | - | 46 | 3 |
| 2020 | - | 2 | - | - | 3 | 25 | 13 | - | 95 | - | - | - | 3 | 8 | - | 48 | 1 |
| 2025 | - | - | - | - | 6 | 17 | 5 | - | 82 | 4 | - | - | - | 43 | - | 32 | 2 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.2 | 0.1 | 0.0 | 4.4 | 0.1 | 0.2 | - | - | 0.8 | 0.0 | 0.2 | 0.0 |
| 2000 | - | - | 0.0 | - | 0.0 | 0.5 | 0.0 | - | 6.6 | 0.0 | - | - | - | 0.2 | - | 0.1 | - |
| 2005 | - | 0.0 | 0.1 | - | 0.0 | 0.1 | 0.2 | - | 4.7 | 0.1 | 0.0 | - | - | 1.3 | 0.0 | 0.5 | - |
| 2010 | - | - | 0.0 | - | - | 0.3 | 0.0 | - | 3.7 | - | - | - | - | 0.1 | 0.0 | 0.3 | 0.0 |
| 2015 | - | 0.2 | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 8.6 | 0.0 | 0.0 | 0.4 | - | 0.0 | - | 0.3 | 0.0 |
| 2020 | - | 0.1 | - | - | 0.0 | 0.6 | 0.0 | - | 3.0 | - | - | - | 0.0 | 0.0 | - | 0.4 | 0.0 |
| 2025 | - | - | - | - | 0.0 | 0.2 | 0.0 | - | 1.6 | 0.0 | - | - | - | 0.1 | - | 0.3 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gilia inconspicua[a] (shy gilia) | Hedysarum boreale (Utah sweetvetch) | Ipomopsis aggregata (scarlet gilia) | Lesquerella alpina (alpine bladderpod) | Linum lewisii (Lewis flax) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Oxytropis lambertii (purple locoweed) | Packera cana (woolly groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon comarrhenus (dusty beardtongue) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) | Polygonum douglasii[a] (Douglas' knotweed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 71 | - | 19 | - | - | 0 | 10 | 13 | - | 2 | 8 | 49 | 1 | 22 | 68 | - |
| 2000 | - | 29 | - | 5 | 1 | - | 4 | 6 | 1 | - | - | 2 | 5 | - | 9 | 8 | - |
| 2005 | - | 49 | 2 | 16 | 2 | - | 8 | 1 | 6 | - | 7 | 14 | 23 | 1 | 18 | 26 | - |
| 2010 | 3 | 41 | - | 4 | - | - | 10 | 1 | 6 | - | - | 11 | 11 | 2 | 15 | 6 | - |
| 2015 | 10 | 39 | - | 7 | - | - | 26 | - | 6 | - | 9 | 7 | 25 | - | 20 | 11 | 3 |
| 2020 | - | 23 | 2 | 4 | 2 | 2 | 13 | - | 3 | - | 4 | - | 17 | 1 | 7 | 5 | - |
| 2025 | - | 18 | - | 2 | - | 2 | 1 | - | 2 | 4 | 4 | - | 16 | 11 | 23 | 4 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 1.6 | - | 0.3 | - | - | 0.0 | 0.2 | 0.3 | - | 0.0 | 0.1 | 0.7 | 0.1 | 0.1 | 0.2 | - |
| 2000 | - | 0.8 | - | 0.0 | 0.0 | - | 0.0 | 0.3 | 0.1 | - | - | 0.0 | 0.1 | - | 0.0 | 0.0 | - |
| 2005 | - | 1.2 | 0.0 | 0.2 | 0.0 | - | 0.3 | 0.0 | 0.2 | - | 0.3 | 0.4 | 0.3 | 0.1 | 0.1 | 0.3 | - |
| 2010 | 0.0 | 0.7 | - | 0.2 | - | - | 0.1 | 0.0 | 0.2 | - | - | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | - |
| 2015 | 0.1 | 1.0 | - | 0.7 | - | - | 0.2 | - | 0.2 | - | 0.7 | 0.1 | 0.4 | - | 0.1 | 0.1 | 0.0 |
| 2020 | - | 0.3 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | 0.6 | - | 0.1 | 0.0 | 0.0 | 0.0 | - |
| 2025 | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.1 | - | 0.2 | 0.0 | 0.1 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Schoenocrambe linifolia (flaxleaf plainsmustard) | Symphyotrichum (aster) | Tetraneuris acaulis (stemless four-nerve daisy) | Thlaspi arvense[ai] (field pennycress) |
|---|---|---|---|---|
| year | Nested Frequency | | | |
| 1995 | 7 | 28 | 1 | 1 |
| 2000 | - | - | - | - |
| 2005 | 12 | - | 3 | - |
| 2010 | 12 | - | 3 | - |
| 2015 | 29 | - | - | - |
| 2020 | 1 | - | - | - |
| 2025 | 13 | - | - | - |
| year | Average Cover (%) | | | |
| 1995 | 0.0 | 0.7 | 0.0 | 0.0 |
| 2000 | - | - | - | - |
| 2005 | 0.1 | - | 0.0 | - |
| 2010 | 0.1 | - | 0.0 | - |
| 2015 | 0.1 | - | - | - |
| 2020 | 0.0 | - | - | - |
| 2025 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11A-02.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | - | - | - | - |
| 2005 | 0.1 | 4.7 | 4.1 | 0.1 | 0.1 |
| 2010 | - | 3.8 | 4.3 | 1 | 0.1 |
| 2015 | 0.2 | 5.1 | 5.9 | 0.9 | 0.1 |
| 2020 | 0.2 | 6.3 | 6.6 | 2.1 | 0.1 |
| 2025 | - | 6.1 | 2.8 | 1.2 | 0.1 |
| year | Quadrat Cover (%) | | | | |
| 1995 | 0.0 | 8.1 | 3.2 | 0.0 | 0.1 |
| 2000 | - | 6.4 | 2.6 | 0.3 | 0.0 |
| 2005 | 0.1 | 4.4 | 2.7 | 1.1 | 0.2 |
| 2010 | - | 2.4 | 2.7 | 1.5 | 0.0 |
| 2015 | 0.2 | 4.5 | 4.7 | 0.8 | 0.5 |
| 2020 | 0.3 | 6.9 | 5.0 | 3.6 | 0.2 |
| 2025 | - | 5.4 | 3.4 | 0.9 | 0.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

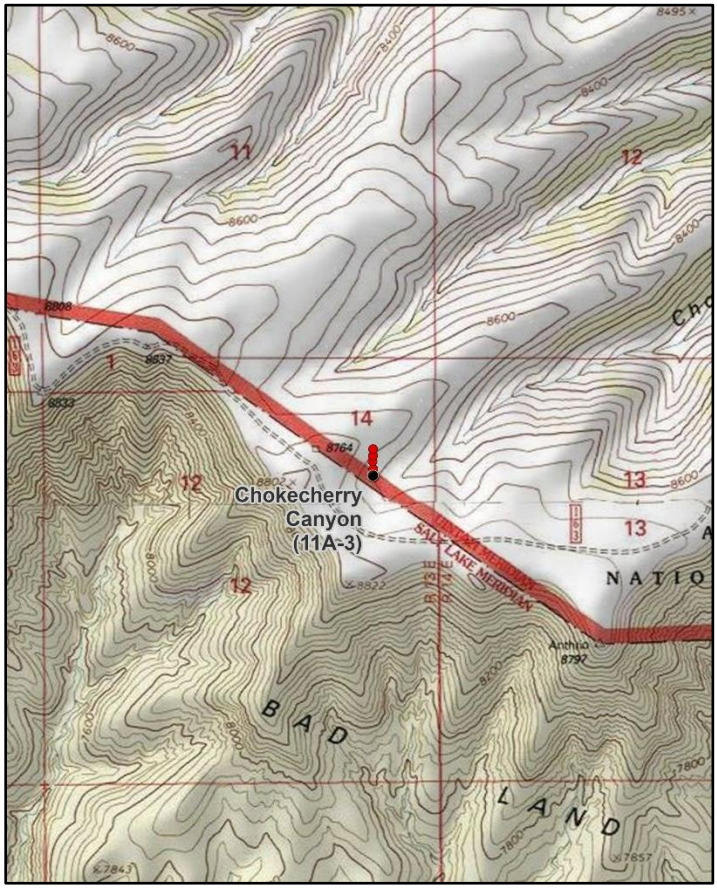
**Table 11A-02.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

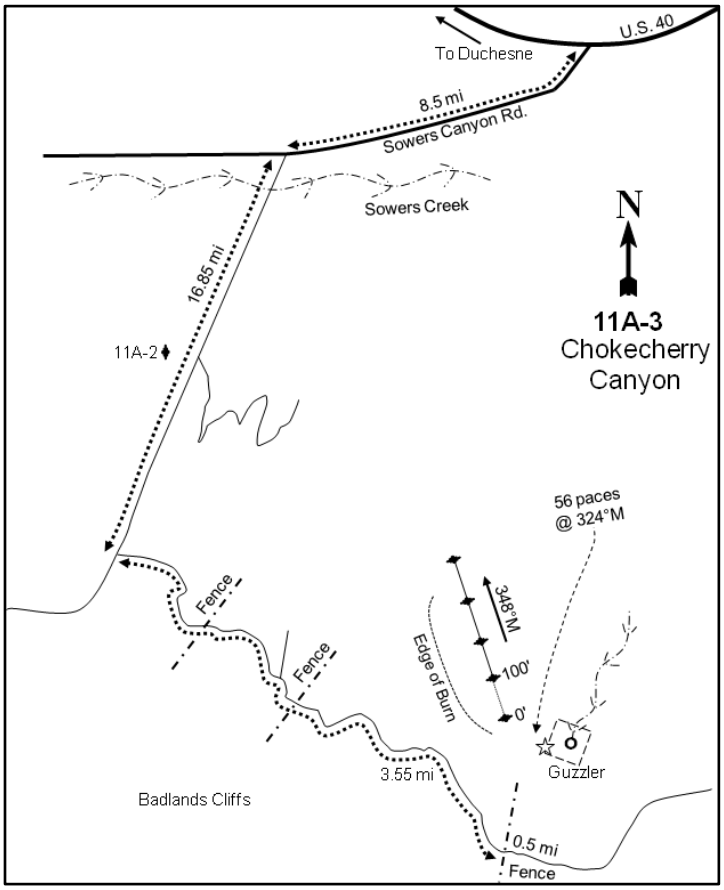
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 40 | 20 | 0 | 100 | 0 | 50 | 0 | 0 | 9/26 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/9 |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/26 |
| 2010 | 40 | - | 50 | 50 | 0 | 0 | 50 | 0 | 8/23 |
| 2015 | 120 | - | 0 | 100 | 0 | 100 | 0 | 0 | 15/27 |
| 2020 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/13 |
| 2025 | 80 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 4080 | 120 | 42 | 52 | 6 | 41 | 9 | 4 | 36/65 |
| 2000 | 3380 | 40 | 11 | 70 | 19 | 49 | 4 | 41 | 33/64 |
| 2005 | 2680 | 520 | 14 | 55 | 31 | 43 | 11 | 13 | 26/50 |
| 2010 | 2180 | 120 | 25 | 62 | 14 | 17 | 43 | 36 | 22/49 |
| 2015 | 1860 | - | 17 | 75 | 8 | 30 | 26 | 9 | 27/51 |
| 2020 | 2000 | 20 | 11 | 85 | 4 | 28 | 16 | 10 | 29/49 |
| 2025 | 1560 | 20 | 0 | 67 | 33 | 31 | 68 | 33 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 4880 | 20 | 11 | 89 | 0 | 0 | 0 | 0 | 21/28 |
| 2000 | 3920 | 20 | 14 | 85 | 2 | 0 | 0 | 0 | 17/25 |
| 2005 | 4740 | - | 8 | 90 | 2 | 8 | 0 | 1 | 18/26 |
| 2010 | 4640 | 20 | 0 | 98 | 1 | 0 | 0 | 0 | 21/26 |
| 2015 | 3780 | - | 3 | 97 | 0 | 2 | 0 | 0 | 25/31 |
| 2020 | 4560 | - | 2 | 97 | 1 | 10 | 0 | 1 | 22/33 |
| 2025 | 4080 | 20 | 2 | 89 | 9 | 24 | 9 | 9 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 69/92 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 58/85 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1580 | 60 | 9 | 91 | 0 | 0 | 0 | 0 | 18/21 |
| 2000 | 760 | - | 0 | 95 | 5 | 0 | 0 | 5 | 11/14 |
| 2005 | 2440 | 20 | 24 | 76 | 0 | 0 | 0 | 0 | 14/15 |
| 2010 | 2940 | - | 1 | 95 | 3 | 1 | 0 | 4 | 16/21 |
| 2015 | 1820 | 640 | 1 | 99 | 0 | 0 | 0 | 0 | 19/22 |
| 2020 | 8420 | - | 9 | 91 | 0 | 0 | 0 | 0 | 13/15 |
| 2025 | 2400 | - | 5 | 94 | 1 | 0 | 0 | 1 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/39 |
| 2000 | - | - | - | - | - | - | - | - | 22/51 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/40 |
| 2010 | - | - | - | - | - | - | - | - | 24/46 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 41/64 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 39/78 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 200 | - | 30 | 70 | 0 | 30 | 0 | 0 | 18/26 |
| 2000 | 420 | - | 14 | 86 | 0 | 10 | 10 | 0 | 16/23 |
| 2005 | 400 | - | 0 | 100 | 0 | 50 | 10 | 0 | 17/28 |
| 2010 | 340 | 20 | 6 | 94 | 0 | 12 | 6 | 0 | 18/25 |
| 2015 | 360 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/33 |
| 2020 | 420 | - | 0 | 91 | 10 | 29 | 29 | 19 | 23/33 |
| 2025 | 320 | - | 6 | 88 | 6 | 19 | 63 | 6 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

# CHOKECHERRY CANYON - STUDY NO. 11A-3




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Anthro Mountain SE; Township 7S, Range 5W, Section 14 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 550577 East 4414261 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9171 |
| Transect Bearing | 348° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (6ft & 95ft), Line 2 (25ft), Line 3 (46ft), Line 4 (62ft) |
| Belt Marker Placement | Belt 2: No Rebar |

## Directions to Site

Driving from the junction of Highway U.S. 40 and 12000 West (near Bridgeland), proceed south on Antelope Canyon Road (which turns into Sowers Canyon Road) for 8.5 miles to Nutters Ridge Road. Turn left and drive south for 16.8 miles up Nutters Ridge to a "T" intersection above the Badland Cliffs. Turn left and go 3.5 miles along the edge of the cliffs to a fence. Continue 0.5 miles and stop. Walk north over the ridge to a large, fenced guzzler. From the southwest fence corner, the 0-foot baseline stake is located 56 paces away at a bearing of 324 degrees magnetic and is marked with browse tag #9171.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | USFS |
| Allotment | ANTELOPE |
| Elevation | 8,700ft (2,652m) |
| Aspect | Southeast |
| Slope | 10-12% |
| Sample Dates | 07/12/1995, 07/12/2000, 07/06/2005, 07/13/2010, 07/16/2015, 07/06/2020, 07/09/2025 |

**Table 11A-03.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Fire - Prescribed | Anthro-Mountain Prescribed Burn | 841 | Fall 2007 | 642 |
| Fire - Prescribed | - | - | 1977 | 500 |

## Wildlife Habitat and Vegetation History

**Table 11A-03.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | substantial | year-long |
| Greater Sage-Grouse | | undefined & undefined |
| Pronghorn | crucial | year-long |

**Table 11A-03.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Perennial Grass | NA |
| 1988 | Perennial Grass/Yellow Rabbitbrush | NA |
| 1995 | Perennial Grass/Yellow Rabbitbrush | NA |
| 2000 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2005 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2010 | Perennial Grass/Mixed Shrub | NA |
| 2015 | Perennial Grass/Mixed Shrub | NA |
| 2020 | Perennial Grass/Mountain Big Sagebrush | NA |
| 2025 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |

## Site Notes

This study is located at the head of Chokecherry and Alkali Canyons and samples a prescribed burn treatment within a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and grass community; the burn was completed in 1977 and consumed approximately 500 acres. The burn was not seeded, but native species have readily re-established in the burned area. The area was treated again by a prescribed fire in the fall of 2007 (Table 11A-03.1).

## Soils

**Table 11A-03.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 6.9 | 32.9 | 33.8 | 33.3 | 4.3 | 11.8 | 217.6 | 0.9 | 07/12/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 20 inches |
| NRCS Ecological Site | High Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY516UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1982, the plant community on this site was dominated by perennial grasses with mixed shrubs, mainly mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and yellow rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *lanceolatus*), as subordinate components; both shrub species have fluctuated in dominance since that time (Photos, Pre-1992 Data). A prescribed fire in 2007 (Table 11A-03.1) led to a decrease in total shrub cover (Table 11A-03.6). However, sagebrush and/or yellow rabbitbrush have remained dominant site components and cover of sagebrush has increased overall since the prescribed burn (Table 11A-03.12). The herbaceous understory has remained diverse with native perennial grasses as the main component (Table 11A-03.7, Table 11A-03.10).

Though species are diverse, cover of grasses and forbs on this site appears limited in the context of forage for summering mule deer. Pellet transect data indicates that deer presence has decreased over time; deer presence was moderate in 2005 and 2010, but low between 2015 and 2025. Although this site falls within currently-mapped mule deer summer range (Table 11A-03.3), the area had frequent occurrences of collared mule deer during the 2024/25 winter season (Wildlife Migration Initiative). Elk presence has varied; elk presence was low between 2005 and 2020, but it was high in 2000, 2005, and 2025. Cattle presence has remained low to absent since study establishment. Utilization of mountain big sagebrush has remained light. On-site observations state that there was little to no utilization on herbaceous species in the most recent sample year (2025) (Photos, Table 11A-03.9, Table 11A-03.10, Table 11A-03.11, Table 11A-03.13). The herbaceous and browse communities appeared to be affected by drought as indicated by poor vigor and limited primary production.

## Trend Summary Tables

**Table 11A-03.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 3.9 | 5.7 | - | - | - | - |
| 2000 | 7.6 | 4.5 | - | - | - | - |
| 2005 | 14.0 | 5.5 | - | 19.6 | 5.4 | - |
| 2010 | 3.0 | 3.9 | - | 3.6 | 3.8 | - |
| 2015 | 5.1 | 8.1 | - | 6.5 | 7.0 | - |
| 2020 | 8.9 | 11.8 | - | 11.4 | 8.8 | - |
| 2025 | 10.4 | 7.9 | - | 12.8 | 3.8 | - |

**Table 11A-03.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 431 | 121 | 340 | - | 21.9 | 0.7 | 11.4 |
| 2000 | - | 434 | 42 | 268 | - | 26.4 | 0.8 | 6.2 |
| 2005 | - | 421 | 144 | 285 | - | 24.1 | 0.7 | 11.1 |
| 2010 | - | 395 | 87 | 308 | - | 20.4 | 0.3 | 11.2 |
| 2015 | - | 453 | 88 | 299 | - | 44.2 | 0.7 | 8.0 |
| 2020 | - | 423 | 168 | 261 | - | 31.4 | 1.1 | 6.9 |
| 2025 | - | 394 | 3 | 265 | - | 23.8 | 0.0 | 5.8 |

**Table 11A-03.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 12.6 | 0.6 | 47.2 | 1.3 | 8.2 | 44.9 |
| 2000 | 25.8 | - | 48.9 | 10.8 | 5.9 | 50.2 |
| 2005 | 19.2 | 0.0 | 29.5 | 5.9 | 7.5 | 50.2 |
| 2010 | 15.1 | - | 37.2 | 7.6 | 8.0 | 46.9 |
| 2015 | 16.1 | 0.0 | 45.5 | 3.8 | 6.7 | 58.7 |
| 2020 | 15.7 | - | 41.7 | 4.1 | 6.0 | 60.8 |
| 2025 | 26.3 | - | 33.3 | 5.4 | 7.2 | 41.7 |

**Table 11A-03.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | - | 3 | 27 | - | 4 |
| 2000 | 1 | 9 | 46 | - | 3 |
| 2005 | - | 11 | 55 | - | 3 |
| 2010 | 1 | 10 | 11 | - | 1 |
| 2015 | - | 3 | 4 | - | - |
| 2020 | 1 | 15 | 6 | - | 5 |
| 2025 | - | 10 | 28 | - | 4 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 0.7 (1.8) | 10.7 (26.5) | 84.5 (208.6) | - | - |
| 2005 | - | 38.9 (96.0) | 76.4 (188.7) | - | - |
| 2010 | - | 23.4 (57.9) | 18.1 (44.7) | - | - |
| 2015 | - | 3.4 (8.3) | 2.7 (6.6) | - | - |
| 2020 | 1.5 (3.6) | 6.7 (16.6) | 17.4 (43.0) | 17.4 (43.0)* | - |
| 2025 | - | 10.7 (26.5) | 41.5 (102.6) | - | - |

*Pellets per acre (ha)

**Table 11A-03.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus marginatus (mountain brome) | Bromus porteri (Porter brome) | Carex (sedge) | Elymus lanceolatus (thickspike wheatgrass) | Elymus trachycaulus (slender wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1995 | 184 | 5 | - | - | 5 | 248 | 134 | 13 | 137 | 56 | 19 | - | - |
| 2000 | 191 | - | - | 3 | 9 | 98 | 277 | 10 | 68 | 14 | 45 | - | - |
| 2005 | 218 | 5 | - | - | 6 | 186 | 200 | - | 40 | 30 | 36 | - | - |
| 2010 | 217 | 2 | - | - | 14 | 206 | 125 | 5 | 109 | 74 | 41 | - | - |
| 2015 | 135 | 29 | - | - | 38 | 230 | 242 | 22 | 163 | 8 | 56 | 13 | 7 |
| 2020 | 131 | 37 | 2 | - | 1 | 176 | 120 | 26 | 122 | 44 | 33 | 9 | 104 |
| 2025 | 164 | 11 | - | - | 5 | 211 | 3 | 5 | 155 | 7 | 30 | - | 168 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1995 | 6.8 | 0.1 | - | - | 0.0 | 5.0 | 3.5 | 0.0 | 3.6 | 2.6 | 0.3 | - | - |
| 2000 | 9.4 | - | - | 0.0 | 0.3 | 0.8 | 13.1 | 0.3 | 1.6 | 0.2 | 0.7 | - | - |
| 2005 | 8.3 | 0.0 | - | - | 0.2 | 2.7 | 9.1 | - | 1.2 | 1.6 | 1.1 | - | - |
| 2010 | 5.8 | 0.1 | - | - | 0.5 | 4.1 | 3.2 | 0.1 | 3.4 | 2.0 | 1.3 | - | - |
| 2015 | 7.1 | 1.0 | - | - | 1.2 | 7.5 | 13.9 | 0.6 | 10.1 | 0.1 | 2.2 | 0.3 | 0.3 |
| 2020 | 5.4 | 2.2 | 0.0 | - | 0.0 | 5.6 | 6.0 | 0.9 | 3.6 | 1.0 | 1.7 | 0.2 | 4.8 |
| 2025 | 8.5 | 0.5 | - | - | 0.3 | 2.4 | 0.0 | 0.0 | 4.2 | 0.1 | 0.3 | - | 7.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11A-03.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Arenaria (sandwort) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Calylophus lavandulifolius (lavenderleaf sundrops) | Castilleja flava (yellow Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium album[a] (lambsquarters) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 32 | - | 18 | - | 5 | 3 | 25 | 11 | 20 | 46 | - | - | 284 | 78 | - | 1 |
| 2000 | - | - | 4 | - | - | - | - | 9 | - | 6 | - | - | 42 | 215 | 4 | 3 | - |
| 2005 | 43 | 3 | - | - | - | 5 | 10 | 15 | 19 | 4 | 34 | 11 | - | 218 | 15 | 1 | 21 |
| 2010 | 8 | 4 | 2 | - | - | 4 | 2 | 21 | 38 | 2 | 22 | 29 | 26 | 243 | 43 | - | - |
| 2015 | 14 | 47 | 3 | 8 | 0 | 2 | - | 12 | 6 | 7 | 8 | 7 | 5 | 226 | 23 | - | 2 |
| 2020 | - | - | 2 | 3 | 3 | 1 | 2 | 10 | 34 | 1 | - | - | - | 200 | 12 | - | - |
| 2025 | 10 | - | - | - | 4 | 10 | - | - | 12 | 3 | - | - | - | 222 | 1 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.3 | - | 0.1 | - | 0.0 | 0.0 | 1.0 | 0.3 | 0.1 | 0.2 | - | - | 3.5 | 0.4 | - | 0.0 |
| 2000 | - | - | 0.3 | - | - | - | - | 0.1 | - | 0.0 | - | - | 0.8 | 3.4 | 0.1 | 0.0 | - |
| 2005 | 0.5 | 0.0 | - | - | - | 0.1 | 0.0 | 0.3 | 0.4 | 0.0 | 0.1 | 0.0 | - | 4.8 | 0.5 | 0.0 | 0.1 |
| 2010 | 0.1 | 0.0 | 0.0 | - | - | 0.1 | 0.0 | 0.7 | 1.0 | 0.0 | 0.1 | 0.1 | 0.0 | 5.0 | 0.4 | - | - |
| 2015 | 0.1 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.5 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 2.6 | 0.4 | - | 0.0 |
| 2020 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.3 | 0.0 | - | - | - | 3.5 | 0.1 | - | - |
| 2025 | 0.0 | - | - | - | 0.0 | 0.0 | - | - | 0.1 | 0.0 | - | - | - | 3.7 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Hedysarum boreale (Utah sweetvetch) | Heterotheca villosa (hairy false goldenaster) | Ipomopsis aggregata (scarlet gilia) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Packera cana (woolly groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon comarrhenus (dusty beardtongue) | Penstemon watsonii (Watson's penstemon) | Phlox longifolia (longleaf phlox) | Physaria acutifolia (sharpleaf twinpod) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 8 | 2 | 73 | 1 | - | 3 | - | 23 | 9 | 27 | 4 | - | 22 | 27 | 89 | 20 | 9 |
| 2000 | - | 14 | 35 | - | 3 | - | - | 10 | 5 | 8 | - | - | 3 | 18 | 13 | 4 | 4 |
| 2005 | 2 | 1 | 29 | - | - | 1 | - | 0 | - | 5 | - | 3 | 5 | 3 | 73 | 8 | 5 |
| 2010 | 6 | 4 | 15 | 1 | 6 | 2 | 1 | 1 | - | 7 | 0 | 0 | 8 | 11 | 76 | 5 | - |
| 2015 | 9 | - | 32 | - | - | - | - | 13 | 0 | 10 | 41 | - | 3 | 41 | 57 | 10 | 1 |
| 2020 | 3 | 4 | 42 | - | - | - | - | 3 | 4 | 7 | 2 | - | 1 | 2 | 43 | 4 | - |
| 2025 | 6 | - | 22 | - | - | - | - | 4 | 12 | 1 | - | - | 7 | 1 | 39 | 7 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.0 | 1.7 | 0.0 | - | 0.0 | - | 0.3 | 0.2 | 0.7 | 0.1 | - | 0.6 | 0.4 | 1.4 | 0.1 | 0.1 |
| 2000 | - | 0.2 | 0.5 | - | 0.0 | - | - | 0.1 | 0.1 | 0.6 | - | - | 0.0 | 0.3 | 0.3 | 0.1 | 0.0 |
| 2005 | 0.0 | 0.0 | 0.6 | - | - | 0.0 | - | 0.0 | - | 0.3 | - | 0.0 | 0.1 | 0.0 | 2.9 | 0.1 | 0.0 |
| 2010 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.6 | 0.0 | 0.0 | 0.0 | 0.1 | 3.0 | 0.0 | - |
| 2015 | 0.1 | - | 0.4 | - | - | - | - | 0.0 | 0.0 | 0.7 | 0.6 | - | 0.0 | 0.4 | 1.4 | 0.2 | 0.0 |
| 2020 | 0.0 | 0.0 | 0.7 | - | - | - | - | 0.0 | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.0 | 1.3 | 0.0 | - |
| 2025 | 0.0 | - | 0.3 | - | - | - | - | 0.2 | 0.1 | 0.0 | - | - | 0.2 | 0.0 | 1.2 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 57 | 8 | - | 20 | 3 |
| 2000 | - | 10 | 1 | 13 | - |
| 2005 | 118 | 4 | 3 | 10 | - |
| 2010 | 29 | 2 | - | 3 | - |
| 2015 | 15 | 2 | 3 | 12 | 12 |
| 2020 | 168 | 3 | - | - | - |
| 2025 | 3 | - | - | - | - |
| year | Average Cover (%) | | | | |
| 1995 | 0.2 | 0.1 | - | 0.3 | 0.0 |
| 2000 | - | 0.0 | 0.0 | 0.2 | - |
| 2005 | 0.5 | 0.0 | 0.0 | 0.1 | - |
| 2010 | 0.1 | 0.1 | - | 0.0 | - |
| 2015 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |
| 2020 | 1.1 | 0.0 | - | - | - |
| 2025 | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11A-03.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia fragilis (brittle pricklypear) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | - | 19 | 0.2 | 5 | - | - | 0.4 | 0.4 |
| 2010 | - | 3.3 | 0 | 3.2 | 0.1 | - | 0.3 | 0.5 |
| 2015 | - | 6.4 | - | 6 | - | 0 | 0.1 | 1 |
| 2020 | 0 | 10.8 | 0.1 | 7.8 | 0.1 | - | 0.5 | 0.9 |
| 2025 | 0.2 | 12.2 | 0.2 | 2.8 | 0.1 | 0.2 | 0.2 | 0.7 |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | - | 1.4 | 0.2 | 4.8 | 0.0 | 0.0 | 2.3 | 0.8 |
| 2000 | - | 7.0 | 0.4 | 4.1 | 0.0 | - | 0.2 | 0.4 |
| 2005 | - | 13.8 | 0.1 | 4.9 | - | - | 0.0 | 0.6 |
| 2010 | - | 2.8 | 0.2 | 3.2 | 0.0 | - | 0.0 | 0.7 |
| 2015 | 0.2 | 5.0 | 0.0 | 6.8 | 0.2 | 0.0 | 0.0 | 1.1 |
| 2020 | 0.0 | 8.6 | 0.1 | 10.4 | 0.0 | 0.0 | 0.2 | 1.4 |
| 2025 | 0.0 | 9.8 | 0.5 | 7.1 | 0.0 | 0.0 | 0.1 | 0.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11A-03.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 120 | - | 17 | 50 | 33 | 0 | 17 | 0 | 13/17 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 200 | - | 30 | 70 | 0 | 60 | 40 | 0 | 18/27 |
| 2020 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/38 |
| 2025 | 200 | - | 0 | 90 | 10 | 0 | 0 | 10 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1500 | 960 | 55 | 43 | 3 | 28 | 1 | 4 | 42/57 |
| 2000 | 6000 | 160 | 48 | 49 | 3 | 12 | 0 | 3 | 36/65 |
| 2005 | 5320 | 12940 | 9 | 85 | 6 | 6 | 1 | 3 | 35/53 |
| 2010 | 2640 | 480 | 49 | 42 | 8 | 26 | 5 | 7 | 35/51 |
| 2015 | 3000 | - | 26 | 74 | 0 | 15 | 11 | 1 | 29/43 |
| 2020 | 3380 | 220 | 7 | 79 | 14 | 12 | 1 | 17 | 40/60 |
| 2025 | 3680 | 100 | 10 | 65 | 25 | 5 | 1 | 35 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 360 | - | 0 | 94 | 6 | 72 | 22 | 6 | 8/22 |
| 2000 | 960 | - | 0 | 98 | 2 | 44 | 0 | 0 | 4/12 |
| 2005 | 300 | - | 0 | 100 | 0 | 27 | 0 | 0 | 8/11 |
| 2010 | 1080 | - | 6 | 94 | 0 | 0 | 0 | 0 | 14/16 |
| 2015 | 80 | - | 0 | 100 | 0 | 25 | 50 | 0 | 11/13 |
| 2020 | 240 | - | 0 | 100 | 0 | 25 | 0 | 0 | 9/15 |
| 2025 | 500 | - | 32 | 68 | 0 | 12 | 8 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 9660 | - | 17 | 83 | 0 | 22 | 0 | 0 | 24/32 |
| 2000 | 5800 | 20 | 11 | 80 | 9 | 5 | 5 | 2 | 20/29 |
| 2005 | 5760 | - | 4 | 94 | 1 | 3 | 0 | 1 | 22/29 |
| 2010 | 6120 | - | 5 | 94 | 1 | 0 | 0 | 0 | 24/29 |
| 2015 | 5740 | - | 6 | 94 | 0 | 1 | 0 | 0 | 25/32 |
| 2020 | 7700 | - | 6 | 91 | 3 | 2 | 0 | 3 | 24/30 |
| 2025 | 5180 | 20 | 4 | 75 | 22 | 21 | 5 | 24 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 7/13 |
| 2000 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/10 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/16 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/16 |
| 2015 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/25 |
| 2020 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/17 |
| 2025 | 560 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/39 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/25 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/35 |
| 2010 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 6/14 |
| 2015 | 240 | 20 | 8 | 92 | 0 | 0 | 0 | 8 | 11/23 |
| 2020 | 220 | - | 9 | 91 | 0 | 0 | 0 | 0 | 7/23 |
| 2025 | 180 | - | 0 | 78 | 22 | 0 | 0 | 22 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

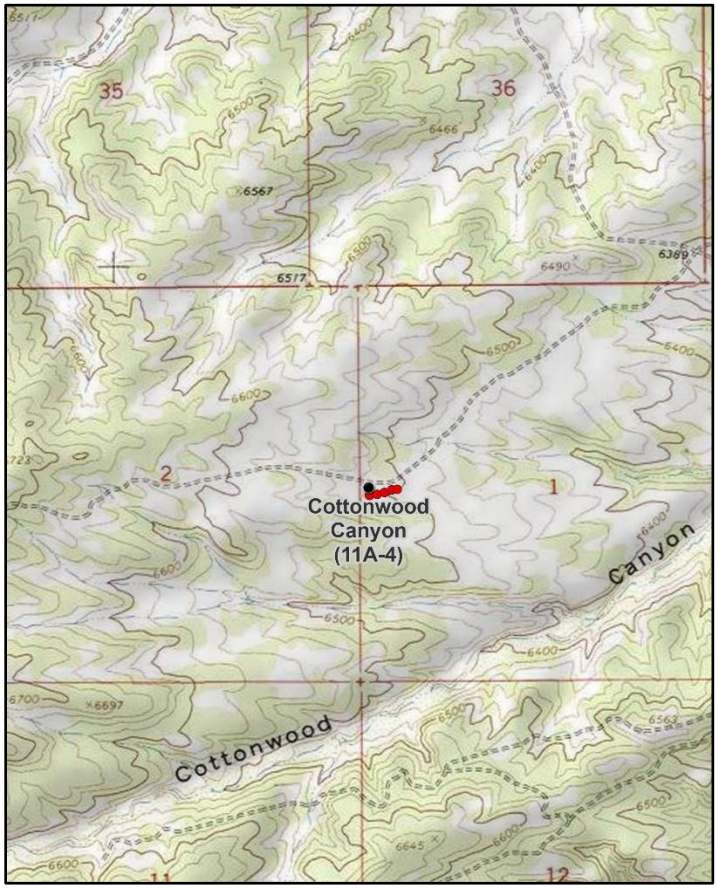
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 1180 | 40 | 12 | 81 | 7 | 5 | 58 | 14 | 35/59 |
| 2000 | 200 | - | 50 | 10 | 40 | 0 | 0 | 0 | 37/66 |
| 2005 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/59 |
| 2010 | 180 | - | 11 | 89 | 0 | 11 | 33 | 0 | 33/60 |
| 2015 | 200 | - | 0 | 90 | 10 | 0 | 10 | 10 | 33/62 |
| 2020 | 180 | 40 | 44 | 56 | 0 | 11 | 0 | 0 | 37/65 |
| 2025 | 220 | 20 | 55 | 36 | 9 | 9 | 9 | 9 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 440 | - | 9 | 86 | 5 | 77 | 5 | 0 | 19/30 |
| 2000 | 500 | - | 12 | 76 | 12 | 52 | 36 | 0 | 15/25 |
| 2005 | 480 | 20 | 4 | 83 | 13 | 38 | 8 | 17 | 20/28 |
| 2010 | 540 | - | 4 | 96 | 0 | 48 | 11 | 0 | 17/25 |
| 2015 | 460 | - | 4 | 96 | 0 | 56 | 17 | 0 | 23/35 |
| 2020 | 540 | - | 0 | 100 | 0 | 15 | 85 | 0 | 19/31 |
| 2025 | 460 | - | 4 | 56 | 39 | 39 | 44 | 39 | - / - |

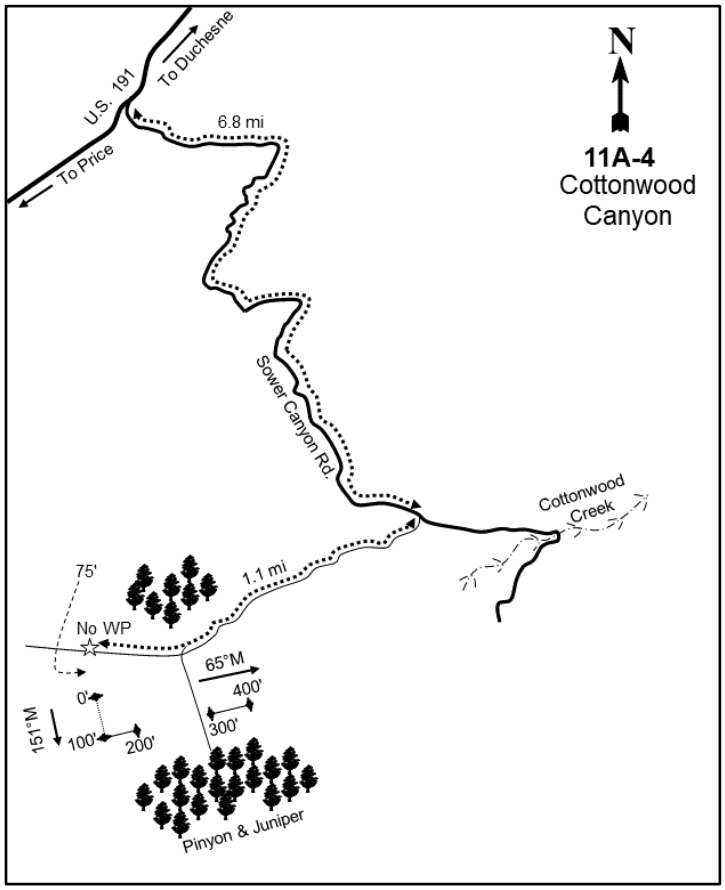
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11A-03.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2025 | 1 | 100 | - | - | - | - | 1.0 |

# COTTONWOOD CANYON - STUDY NO. 11A-4




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Duchesne SW NE; Township 5S, Range 5W, Section 01 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 550716 East 4436264 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 9037 |
| Transect Bearing | 151° magnetic (Lines 2-4: 65° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft & 59ft), Line 3 (road), Line 4 (71ft) |
| Belt Marker Placement | Line 4: 74ft Long |

**Directions to Site**

From Duchesne, travel up Indian Canyon (U.S. 191) approximately 2.5 miles to Cottonwood-Sowers Canyon Road. Turn left and continue to the southeast on the main road for 6.4 miles to a jeep trail on top of the ridge just before Cottonwood Creek. Turn right on the jeep trail and drive 1 mile west to a fork. Continue approximately 0.1 miles up the right fork to the study site. The 0-foot baseline stake is 15 paces south of the road and is marked with browse tag #9037. The baseline is interrupted between the second and third lines. Due to an oil and gas road that crosses line 3, there are 300-foot stakes on both sides of the road. Belt 4 should be placed measuring away from the second 300-foot stake and **not** the first one.

| Site Information | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 6,500ft (1,981m) |
| Aspect | East |
| Slope | 2% |
| Sample Dates | 07/18/1995, 07/11/2000, 06/30/2005, 07/15/2010, 06/29/2015, 07/21/2021, 07/16/2025 |

## Wildlife Habitat and Vegetation History

**Table 11A-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Pronghorn | substantial | year-long |

**Table 11A-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Perennial Grass/Prairie Sagewort | No Encroachment |
| 1995 | Perennial Grass/Shadscale | No Encroachment |
| 2000 | Perennial Grass | No Encroachment |
| 2005 | Perennial Grass/Shadscale | No Encroachment |
| 2010 | Perennial Grass/Shadscale/Winterfat | No Encroachment |
| 2015 | Perennial Grass/Winterfat | No Encroachment |
| 2021 | Perennial Grass/Winterfat | No Encroachment |
| 2025 | Perennial Grass/Winterfat | No Encroachment |

## Site Notes

The study is in a mixed desert shrub and grass community surrounded by twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. It is important to note that sometime after 2010, a new oil and gas road was put in and it was noted that line 2 could be colonized by plant species that may not be representative of the stand. Data gathered from the two belts on this line could possibly explain the marked increase of prairie sagewort (*Artemisia frigida*) in 2015. Rebar was observed for belts 2 and 3 on line 3 in 2025 and the site was set up with the belts on that line (instead of line 2) during that year.

## Soils

**Table 11A-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.5 | 36.9 | 34.8 | 28.3 | 1.9 | 8.7 | 233.6 | 0.7 | 07/11/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Semidesert Silt Loam (Winterfat) |
| NRCS Ecological Site # | R034BY240UT |
| States and Transitions | 1982-2015 - Current Potential State: Community Phase 2.1<br>2021-2025 - Current Potential State: Community Phase 2.2 |

From study establishment in 1988 through 1995, this site was dominated by perennial grass with varying amounts of prairie sagewort (*Artemisia frigida*), shadscale (*Atriplex confertifolia*) and winterfat (*Krascheninnikovia lanata*) as subordinate shrub species (Photos, Pre-1992 Data, Table 11A-04.7, Table 11A-04.13). However, in 2000 the total cover of all shrub species decreased and the vegetation on site was primarily comprised of perennial grasses. In 2005, shrub cover increased substantially, with shadscale being the most dominant species. Winterfat and/or shadscale have remained the dominant shrub species since 2010. Winterfat increased in cover in 2025 (Table 11A-04.12), with the increased dominance likely a result of persistent drought. The herbaceous understory has remained fairly abundant throughout the study period and has consistently been dominated by perennial grasses; forbs have remained rare. The perennial grass species needle and thread (*Hesperostipa comata*) increased steadily in cover over the years, exhibited a notable decrease in 2021, and then rebounded in 2025 (Table 11A-04.10, 11A-04.11). Due to increased human activity in the area, there is a potential for change in vegetation composition in the future.

Mule deer winter range conditions have varied between fair and excellent since 1995. Winter habitat condition was considered good-excellent in 2025, and was generally limited by low preferred browse cover and recruitment, and very low forb cover (Table 11A-04.6, Table 11A-04.7, Table 11A-04.13, Table 11A-04.15). Mule deer presence has remained low throughout the study period. Elk presence ranged between moderate and high between 2000 and 2010, but it has remained low since 2015 (Table 11A-04.9). Shadscale saltbush and winterfat are two preferred browse species with population sizes that benefit wildlife. Utilization for both species has remained light in most sample years. However, winterfat utilization was at its highest with 82% and 62% of plants sampled in density strips being moderately to heavily hedged in 2000 and 2015, respectively (Table 11A-04.13). It should be noted that this community is susceptible to severe drought. Drought combined with heavy utilization could lead to a decrease in preferred browse abundance and the associated loss of utility for wildlife.

## Trend Summary Tables

**Table 11A-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 7.7 | 0.3 | - | - | - | - |
| 2000 | 3.7 | 0.2 | - | - | - | - |
| 2005 | 8.7 | 0.2 | - | 14.5 | 0.1 | - |
| 2010 | 6.3 | 0.0 | - | 8.5 | - | - |
| 2015 | 12.8 | 0.0 | - | 13.5 | - | - |
| 2021 | 8.6 | 0.0 | - | 11.2 | - | - |
| 2025 | 12.0 | 0.1 | - | 14.4 | - | - |

**Table 11A-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 1 | 406 | 217 | 77 | 0.0 | 18.1 | 2.6 | 0.5 |
| 2000 | - | 418 | - | 21 | - | 21.4 | - | 0.1 |
| 2005 | - | 370 | 175 | 39 | - | 19.4 | 1.3 | 2.3 |
| 2010 | - | 344 | 31 | 45 | - | 22.4 | 0.3 | 1.0 |
| 2015 | 7 | 402 | 47 | 45 | 0.0 | 35.4 | 0.3 | 0.5 |
| 2021 | - | 378 | 11 | 6 | - | 20.5 | 0.0 | 0.1 |
| 2025 | - | 360 | - | 10 | - | 30.0 | - | 0.1 |

**Table 11A-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 19.9 | 4.3 | 28.0 | 7.8 | 0.9 | 30.9 |
| 2000 | 39.6 | 1.8 | 29.2 | 8.6 | 0.1 | 28.7 |
| 2005 | 57.4 | 0.3 | 13.5 | 8.1 | 0.1 | 30.1 |
| 2010 | 28.6 | 0.4 | 46.4 | 6.0 | 0.0 | 32.2 |
| 2015 | 29.5 | 1.1 | 23.9 | 6.3 | 0.3 | 50.5 |
| 2021 | 24.7 | 2.7 | 39.7 | 10.0 | 0.3 | 31.1 |
| 2025 | 21.1 | 2.4 | 30.1 | 14.9 | 0.5 | 40.7 |

**Table 11A-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 2 | 13 | 15 | 26 |
| 2000 | - | 7 | 28 | 36 |
| 2005 | - | 14 | 39 | 48 |
| 2010 | - | 12 | 27 | 25 |
| 2015 | - | 2 | 3 | 4 |
| 2021 | - | 21 | 12 | 29 |
| 2025 | - | 14 | 7 | 13 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 15.4 (38.1) | 78.4 (193.7) | - |
| 2005 | - | 0.7 (1.7) | 34.9 (86.1) | - |
| 2010 | - | 4.7 (11.6) | 42.9 (105.9) | - |
| 2015 | - | 4.0 (9.9) | 6.0 (14.9) | - |
| 2021 | - | 6.7 (16.6) | 6.7 (16.6) | - |
| 2025 | - | 4.7 (11.6) | 8.1 (19.9) | - |

**Table 11A-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Pseudoroegneria spicata (bluebunch wheatgrass) | Sporobolus cryptandrus (sand dropseed) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1995 | 47 | 220 | 1 | 15 | 304 | 176 | 4 | - |
| 2000 | 21 | 169 | - | 40 | 327 | 195 | - | - |
| 2005 | 18 | 87 | - | 14 | 189 | 283 | - | 6 |
| 2010 | 19 | 81 | - | 7 | 126 | 282 | - | - |
| 2015 | 7 | 91 | 7 | 1 | 107 | 366 | - | - |
| 2021 | 3 | 122 | - | 13 | 100 | 281 | 22 | 7 |
| 2025 | 17 | 111 | - | 6 | 145 | 266 | - | 5 |
| year | Average Cover (%) | | | | | | | |
| 1995 | 1.1 | 4.8 | 0.0 | 0.1 | 6.5 | 5.6 | 0.0 | - |
| 2000 | 0.5 | 4.8 | - | 0.8 | 5.8 | 9.4 | - | - |
| 2005 | 0.5 | 2.4 | - | 0.3 | 4.6 | 11.3 | - | 0.2 |
| 2010 | 0.6 | 1.7 | - | 0.0 | 2.6 | 17.4 | - | - |
| 2015 | 0.4 | 2.6 | 0.0 | 0.0 | 2.3 | 30.0 | - | - |
| 2021 | 0.2 | 4.2 | - | 1.0 | 1.0 | 13.0 | 0.9 | 0.2 |
| 2025 | 0.8 | 4.5 | - | 0.1 | 3.9 | 20.7 | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11A-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Arabis (rockcress) | Astragalus purshii (woollypod milkvetch) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Halogeton glomeratus[ai] (saltlover) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera grindelioides (rayless tansyaster) | Navarretia intertexta[a] (needleleaf navarretia) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Taraxacum officinale (common dandelion) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 6 | 81 | 69 | 4 | 39 | - | 35 | 4 | 140 | - | - | 51 | 15 | - | 2 | 4 |
| 2000 | - | - | - | - | - | - | - | - | - | - | 5 | - | 5 | 8 | - | - | 4 |
| 2005 | - | - | 16 | 20 | - | 3 | 4 | 121 | - | 65 | - | - | 6 | 31 | - | - | 2 |
| 2010 | - | - | 2 | - | - | - | 11 | 16 | - | 7 | - | - | 22 | 25 | - | - | - |
| 2015 | 4 | - | - | - | - | 27 | - | 18 | - | 3 | - | 7 | 6 | 22 | 5 | - | 4 |
| 2021 | - | - | 4 | 7 | - | - | - | - | - | - | - | - | - | 6 | - | - | - |
| 2025 | - | - | - | - | - | - | - | - | - | - | - | - | 5 | 5 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | 0.6 | 0.2 | 0.0 | 0.4 | - | 0.3 | 0.0 | 1.1 | - | - | 0.3 | 0.1 | - | 0.0 | 0.0 |
| 2000 | - | - | - | - | - | - | - | - | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 |
| 2005 | - | - | 0.0 | 0.2 | - | 0.0 | 0.0 | 0.8 | - | 0.2 | - | - | 0.1 | 2.2 | - | - | 0.0 |
| 2010 | - | - | 0.0 | - | - | - | 0.2 | 0.1 | - | 0.0 | - | - | 0.3 | 0.6 | - | - | - |
| 2015 | 0.0 | - | - | - | - | 0.2 | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | 0.3 | 0.1 | - | 0.0 |
| 2021 | - | - | 0.0 | 0.0 | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - |
| 2025 | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11A-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia polyacantha (plains pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Picrothamnus desertorum (bud sagebrush) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2005 | 1.1 | 0.4 | 8.9 | 0.1 | 4.1 | - | - | - |
| 2010 | 0.5 | 0.2 | 4.1 | - | 3.7 | - | - | - |
| 2015 | 4.7 | - | 2.4 | - | 6.4 | - | - | - |
| 2021 | - | - | 3.3 | - | 7.9 | - | - | - |
| 2025 | 0.3 | - | 2.9 | 0 | 11.2 | - | 0 | - |
| year | Quadrat Cover (%) | | | | | | | |
| 1995 | 1.3 | - | 4.8 | 0.2 | 1.6 | - | - | 0.2 |
| 2000 | 1.6 | 0.1 | 1.6 | - | 0.3 | - | - | 0.2 |
| 2005 | 0.5 | 0.0 | 4.6 | 0.0 | 3.6 | - | - | 0.1 |
| 2010 | 0.3 | 0.0 | 2.1 | - | 3.9 | - | - | 0.0 |
| 2015 | 4.8 | 0.0 | 1.3 | - | 6.6 | 0.0 | 0.0 | - |
| 2021 | - | 0.0 | 1.6 | - | 7.0 | 0.0 | - | - |
| 2025 | 0.4 | - | 2.4 | 0.0 | 9.1 | 0.0 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11A-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 14260 | 2920 | 68 | 32 | 0 | 2 | 0 | 0 | 39/23 |
| 2000 | 8680 | 20 | 17 | 62 | 21 | 21 | 1 | 43 | 4/11 |
| 2005 | 960 | 1020 | 0 | 100 | 0 | 4 | 8 | 0 | 39/36 |
| 2010 | 800 | 20 | 38 | 60 | 3 | 5 | 3 | 3 | 14/18 |
| 2015 | 10480 | 1220 | 35 | 65 | 0 | 7 | 0 | 0 | 16/24 |
| 2021 | 40 | - | 0 | 50 | 50 | 50 | 0 | 50 | - / - |
| 2025 | 1040 | - | 27 | 71 | 2 | 4 | 0 | 2 | - / - |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 160 | - | 0 | 100 | 0 | 63 | 0 | 0 | 34/41 |
| 2000 | 160 | - | 0 | 0 | 100 | 13 | 63 | 100 | 15/53 |
| 2005 | 100 | 960 | 0 | 40 | 60 | 0 | 0 | 60 | 24/46 |
| 2010 | 120 | - | 33 | 17 | 50 | 67 | 0 | 50 | 15/39 |
| 2015 | 180 | - | 33 | 67 | 0 | 33 | 44 | 44 | 16/48 |
| 2021 | 180 | - | 11 | 22 | 67 | 22 | 0 | 78 | - / - |
| 2025 | - | - | - | - | - | - | - | - | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 44/66 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 100 | 100 | 53/101 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 44/85 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 46/80 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 22/38 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | 2100 | 60 | 2 | 89 | 10 | 10 | 2 | 5 | 33/59 |
| 2000 | 1740 | - | 0 | 30 | 70 | 31 | 48 | 54 | 22/46 |
| 2005 | 1420 | 300 | 4 | 86 | 10 | 0 | 0 | 7 | 38/80 |
| 2010 | 1120 | 40 | 20 | 77 | 4 | 2 | 0 | 7 | 28/58 |
| 2015 | 1060 | - | 9 | 77 | 13 | 17 | 0 | 17 | 27/48 |
| 2021 | 860 | - | 5 | 28 | 67 | 5 | 0 | 72 | - / - |
| 2025 | 1020 | 20 | 20 | 63 | 18 | 0 | 0 | 20 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/29 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/9 |
| 2005 | - | - | - | - | - | - | - | - | 24/58 |
| 2010 | - | - | - | - | - | - | - | - | 17/32 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 120 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | 23/29 |
| 2000 | 60 | - | 0 | 33 | 67 | 0 | 0 | 0 | 9/15 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/29 |
| 2010 | - | - | - | - | - | - | - | - | 17/29 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 100 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | 1420 | - | 4 | 96 | 0 | 38 | 1 | 0 | 30/27 |
| 2000 | 1080 | - | 4 | 33 | 63 | 30 | 52 | 63 | 8/14 |
| 2005 | 6480 | 4960 | 40 | 59 | 0 | 20 | 2 | 0 | 28/32 |
| 2010 | 11120 | 80 | 35 | 65 | 0 | 0 | 0 | 9 | 21/25 |
| 2015 | 9540 | - | 23 | 77 | 0 | 43 | 19 | 11 | 21/29 |
| 2021 | 8940 | 20 | 3 | 63 | 34 | 35 | 5 | 44 | - / - |
| 2025 | 10200 | 160 | 2 | 96 | 2 | 27 | 0 | 10 | - / - |

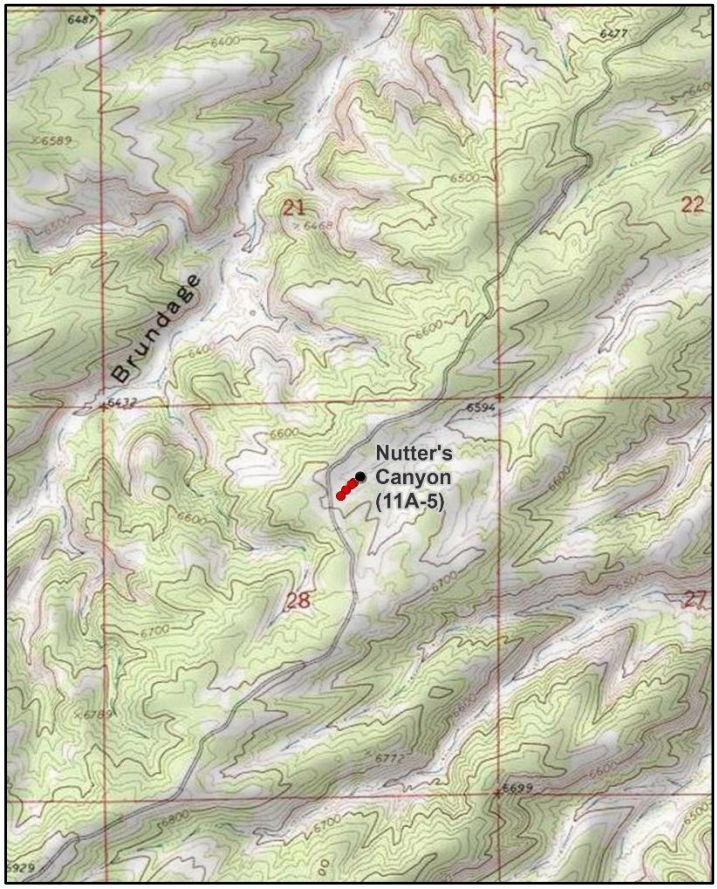
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 19/38 |
| 2000 | - | - | - | - | - | - | - | - | 8/27 |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 10/29 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/38 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 0 | 50 | 14/35 |
| 2021 | 100 | - | 20 | 80 | 0 | 20 | 0 | 0 | - / - |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Picrothamnus desertorum -- (bud sagebrush) | | | | | | | | | |
| 1995 | 440 | - | 5 | 96 | 0 | 27 | 73 | 0 | 15/30 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/33 |
| 2005 | 20 | 20 | 0 | 0 | 100 | 0 | 0 | 100 | 14/36 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 72/93 |
| 2010 | - | - | - | - | - | - | - | - | 65/69 |

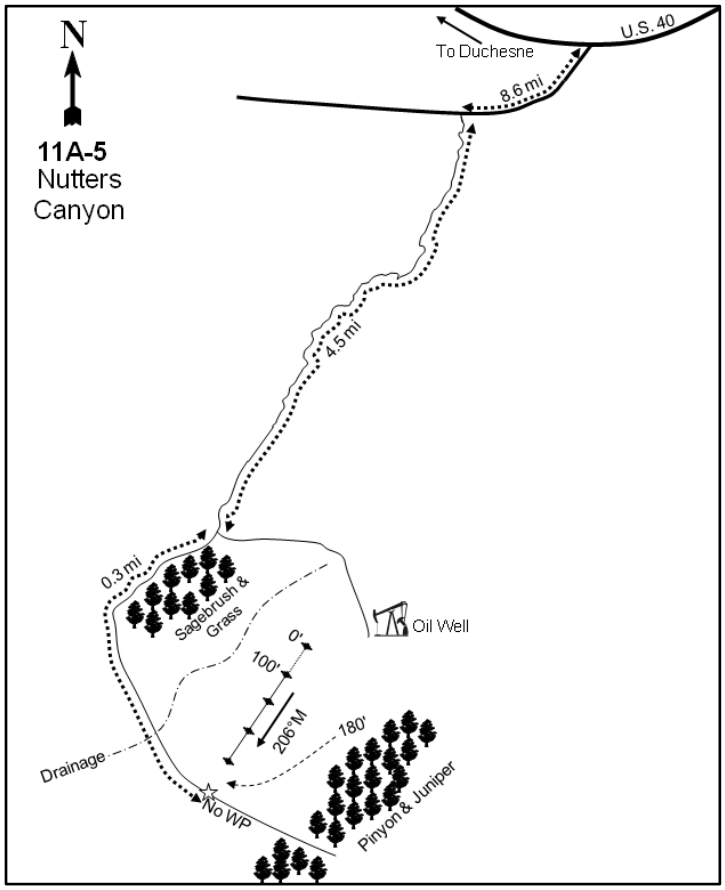
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11A-04.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 8.1 | 13.2 | 7.0 | 30.0 | 0.0 | 0.9 | 0.0 | **59.2** | Good |
| 2000 | 3.8 | 0.0 | 0.0 | 30.0 | 0.0 | 0.2 | 0.0 | **34.0** | Fair |
| 2005 | 15.6 | 12.6 | 7.0 | 30.0 | 0.0 | 4.6 | 0.0 | **69.8** | Excellent |
| 2010 | 9.5 | 14.0 | 13.9 | 30.0 | 0.0 | 2.0 | 0.0 | **69.4** | Excellent |
| 2015 | 15.1 | 14.3 | 12.5 | 30.0 | 0.0 | 1.0 | 0.0 | **72.9** | Excellent |
| 2021 | 13.2 | 1.9 | 1.8 | 30.0 | 0.0 | 0.1 | 0.0 | **47.0** | Fair-Good |
| 2025 | 17.2 | 13.4 | 2.9 | 30.0 | 0.0 | 0.2 | 0.0 | **63.7** | Good-Excellent |

# NUTTER'S CANYON - STUDY NO. 11A-5




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Duchesne SE SW; Township 5S, Range 4W, Section 28 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 556507 East 4430407 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 9035 |
| Transect Bearing | 206° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 3: 2ft |

**Directions to Site**

From Highway U.S. 40 near Bridgeland, turn south and go up Anthro Mountain-Sowers Canyon Road. Continue for 8.6 miles to the turnoff to Nutter's Ridge by an old cabin and an oil well. Turn left and go 4.5 miles up the ridge on the main road (stay left at major forks) to another fork to an oil well. Bear right and continue 0.3 miles to where the road curves and crosses a small drainage. Stop before you drive back into the pinyon and juniper and walk down into the sagebrush opening for about 180 feet to the 400-foot baseline stake. The 0-foot baseline stake is marked with browse tag #9035.

| Site Information | |
|---|---|
| Land Ownership | Tribal |
| Land Administrator | Tribal |
| Allotment | No data |
| Elevation | 6,667ft (2,032m) |
| Aspect | North |
| Slope | 4% |
| Sample Dates | 07/14/1995, 07/11/2000, 06/30/2005, 07/15/2010, 06/29/2015, 07/28/2025 |

## Wildlife Habitat and Vegetation History

**Table 11A-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 11A-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1988 | Perennial Grass/Black Sagebrush | Early Phase I |
| 1995 | Perennial Grass/Black Sagebrush | Early Phase I |
| 2000 | Perennial Grass/Black Sagebrush | Early Phase I |
| 2005 | Perennial Grass/Black Sagebrush | Early Phase I |
| 2010 | Perennial Grass/Black Sagebrush | Early Phase I |
| 2015 | Perennial Grass/Black Sagebrush | Early Phase I |
| 2025 | Perennial Grass/Black Sagebrush | Early Phase I |

## Site Notes

This study is located above Nutters Canyon in the middle of a sagebrush (*Artemisia* spp.) and grass swale surrounded by twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. Natural sagebrush and grass openings are found within the heads of most of the drainages. There are roads along most of the main ridges, plus spur roads going to numerous oil wells within the area. Cattle grazing and use is relatively light on this Ute Indian Tribe land.

## Soils

**Table 11A-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.4 | 44.9 | 33.8 | 21.3 | 2.3 | 6.6 | 220.8 | 0.9 | 07/11/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 12 inches |
| NRCS Ecological Site | Upland Shallow Loam (Black Sagebrush) |
| NRCS Ecological Site # | R034BY320UT |
| States and Transitions | 1988-2025 - Reference State: Community Phase 1.1 |

Since study establishment in 1988, the plant community on this site has been dominated by perennial grasses with black sagebrush (*Artemisia nova*) as a subordinate species. Cover of sagebrush has remained relatively stable, although it decreased in 2005 and 2010 (Table 11A-05.7, Table 11A-05.12). The herbaceous understory has remained abundant and diverse with the native perennial grass needle and thread (*Hesperostipa comata*) providing the most cover of any single species since 2010. Forbs have remained rare (Table 11A-05.10, Table 11A-05.11). In the future, this site could potentially be further encroached by twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) (Table 11A-05.12, Table 11A-05.14). However, the site has remained within Early Phase I of woodland succession since study establishment (Table 11A-05.4), indicating that further encroachment may not be an immediate concern.

Condition of deer winter range on this site has ranged between poor-fair and good-excellent since 1995. Winter range condition for mule deer was considered to be fair in 2025. The main factors negatively affecting winter range condition include reduced preferred browse cover and a lack of recruitment, and a lack of perennial forb cover (Table 11A-05.6, Table 11A-05.7, Table 11A-05.13, Table 11A-05.15). Pellet transect data indicates that deer presence has varied between low and high since 2000; deer presence was moderate in 2025. Elk presence has decreased over time. More specifically, elk presence was high in 2000 but low in 2025. Utilization of black sagebrush has been highly variable, but was at its heaviest in 2015 with 45% of the population being moderately hedged and 42% being heavily hedged. On-site observations for 2025 noted little to no utilization on the herbaceous community. It was also noted that herbaceous and browse species may have been drought affected as evidenced by chlorotic and discolored leaves. However, good seed production was also noted (Photos, Table 11A-05.9, Table 11A-05.13). It should be noted that this community could be susceptible to severe drought, and when combined with heavy utilization, this could lead to a decrease in preferred browse abundance and loss of utility for wildlife.

## Trend Summary Tables

**Table 11A-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 17.5 | 0.2 | - | - | - | - |
| 2000 | 17.3 | 0.6 | - | - | - | - |
| 2005 | 9.3 | 0.3 | 0.0 | 15.8 | 0.5 | 0.5 |
| 2010 | 8.4 | 0.5 | 0.0 | 11.8 | 0.7 | 0.7 |
| 2015 | 12.4 | 1.2 | 0.5 | 17.1 | 1.1 | 1.3 |
| 2025 | 15.4 | 0.5 | 0.6 | 15.5 | 0.1 | 0.9 |

**Table 11A-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 331 | 120 | 145 | - | 6.7 | 0.9 | 0.7 |
| 2000 | - | 345 | - | 6 | - | 11.4 | - | 0.0 |
| 2005 | - | 313 | 57 | 72 | - | 17.8 | 0.2 | 1.3 |
| 2010 | - | 331 | 7 | 96 | - | 17.7 | 0.0 | 0.7 |
| 2015 | - | 350 | 3 | 62 | - | 27.2 | 0.0 | 0.6 |
| 2025 | - | 310 | - | 26 | - | 19.8 | - | 0.3 |

**Table 11A-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 5.5 | 0.1 | 25.2 | 46.9 | 0.8 | 25.8 |
| 2000 | 9.8 | 2.7 | 19.1 | 44.0 | 2.4 | 29.1 |
| 2005 | 28.1 | 0.9 | 21.1 | 30.1 | 1.1 | 27.6 |
| 2010 | 10.7 | 1.7 | 33.7 | 32.6 | 0.8 | 31.4 |
| 2015 | 6.8 | 4.0 | 20.2 | 36.2 | 2.4 | 42.1 |
| 2025 | 7.6 | 5.8 | 19.8 | 43.0 | 2.7 | 33.2 |

**Table 11A-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|
| | Quadrat Frequency | | |
| 1995 | 17 | 15 | 6 |
| 2000 | 9 | 24 | 10 |
| 2005 | 24 | 37 | 6 |
| 2010 | 23 | 12 | 6 |
| 2015 | 11 | 5 | 1 |
| 2025 | 18 | 6 | 3 |
| Year | Days Use Per Acre (ha) | | |
| 1995 | - | - | - |
| 2000 | 5.3 (13.2) | 40.2 (99.3) | - |
| 2005 | 40.9 (101.0) | 30.8 (76.1) | - |
| 2010 | 34.2 (84.4) | 21.5 (53.0) | - |
| 2015 | 15.4 (38.1) | 6.7 (16.6) | - |
| 2025 | 33.5 (82.8) | 8.1 (19.9) | - |

**Table 11A-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | 9 | 156 | 171 | 17 | 191 | 21 | 18 |
| 2000 | 7 | 171 | 183 | 21 | 150 | 16 | 8 |
| 2005 | - | 70 | 196 | 11 | 164 | 5 | 28 |
| 2010 | 4 | 72 | 107 | 3 | 231 | 10 | 62 |
| 2015 | 0 | 93 | 150 | - | 285 | 1 | 52 |
| 2025 | - | 121 | 14 | 8 | 266 | 4 | 16 |
| year | Average Cover (%) | | | | | | |
| 1995 | 0.1 | 1.2 | 2.0 | 0.2 | 2.9 | 0.2 | 0.1 |
| 2000 | 0.1 | 3.2 | 3.3 | 0.1 | 4.5 | 0.1 | 0.0 |
| 2005 | - | 1.6 | 7.6 | 0.0 | 8.0 | 0.0 | 0.4 |
| 2010 | 0.0 | 1.1 | 2.8 | 0.0 | 13.0 | 0.1 | 0.8 |
| 2015 | 0.0 | 2.4 | 5.1 | - | 19.2 | 0.0 | 0.6 |
| 2025 | - | 2.6 | 0.2 | 0.0 | 16.7 | 0.0 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11A-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Antennaria (pussytoes) | Arabis perennans (perennial rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus purshii (woollypod milkvetch) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Erigeron pumilus (shaggy fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Navarretia intertexta[a] (needleleaf navarretia) | Orobanche (broomrape) | Phlox longifolia (longleaf phlox) | Schoenocrambe linifolia (flaxleaf plainsmustard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 19 | 45 | - | 59 | 38 | 3 | 1 | 50 | 3 | 5 | 52 | 3 | 35 | 1 | 43 | 10 |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| 2005 | - | - | 21 | - | 8 | - | 6 | - | 1 | - | 3 | 46 | 1 | 3 | - | 24 | 4 |
| 2010 | - | - | 10 | - | - | - | 2 | 41 | 3 | - | - | 4 | - | - | - | 19 | 4 |
| 2015 | 2 | 10 | 5 | 1 | 3 | - | - | 7 | 3 | - | - | - | - | - | - | 29 | 2 |
| 2025 | - | - | - | - | - | - | - | 3 | - | 2 | - | - | - | - | - | 11 | 5 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | 0.2 | - | 0.2 | 0.2 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 |
| 2005 | - | - | 0.1 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.1 | 0.2 |
| 2010 | - | - | 0.0 | - | - | - | 0.0 | 0.2 | 0.0 | - | - | 0.0 | - | - | - | 0.1 | 0.0 |
| 2015 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | - | - | 0.0 | 0.0 | - | - | - | - | - | - | 0.1 | 0.0 |
| 2025 | - | - | - | - | - | - | - | 0.0 | - | 0.0 | - | - | - | - | - | 0.0 | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Taraxacum officinale (common dandelion) | Townsendia (Townsend daisy) |
|---|---|---|---|---|
| year | Nested Frequency | | | |
| 1995 | 21 | - | 1 | - |
| 2000 | 2 | - | - | - |
| 2005 | 20 | - | - | 2 |
| 2010 | 23 | - | - | 4 |
| 2015 | 12 | 9 | - | 3 |
| 2025 | 9 | - | - | - |
| year | Average Cover (%) | | | |
| 1995 | 0.1 | - | 0.0 | - |
| 2000 | 0.0 | - | - | - |
| 2005 | 0.8 | - | - | 0.0 |
| 2010 | 0.3 | - | - | 0.0 |
| 2015 | 0.3 | 0.1 | - | 0.0 |
| 2025 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11A-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. glabrata (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 11.8 | - | 3.4 | 0.5 | - | - | 0.6 | - | - | 0.5 |
| 2010 | 0 | 10.5 | - | 1 | 0.5 | - | 0.2 | 0.3 | - | - | 0.7 |
| 2015 | 0.2 | 15.7 | - | 0.9 | 1.1 | - | - | 0.3 | - | - | 1.3 |
| 2025 | - | 13.4 | - | 1 | 0.1 | - | - | 1.1 | - | - | 0.9 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1995 | 0.0 | 16.1 | - | 1.3 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | - |
| 2000 | 0.0 | 16.6 | - | 0.7 | 0.2 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | - |
| 2005 | 0.0 | 7.6 | - | 1.4 | 0.3 | - | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| 2010 | 0.0 | 7.5 | 0.0 | 0.5 | 0.4 | - | 0.0 | 0.4 | 0.1 | 0.0 | 0.0 |
| 2015 | 0.3 | 10.9 | - | 0.9 | 1.0 | - | 0.1 | 0.3 | 0.0 | 0.0 | 0.5 |
| 2025 | 0.0 | 14.1 | - | 0.4 | 0.3 | - | 0.0 | 0.8 | 0.1 | 0.0 | 0.6 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11A-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 240 | 40 | 58 | 42 | 0 | 0 | 0 | 0 | 31/24 |
| 2000 | 200 | - | 30 | 70 | 0 | 0 | 0 | 0 | 7/11 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/20 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 21/24 |
| 2015 | 320 | 100 | 56 | 44 | 0 | 56 | 44 | 0 | 15/30 |
| 2025 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | 10840 | 320 | 17 | 71 | 12 | 58 | 32 | 6 | 29/45 |
| 2000 | 12100 | 200 | 4 | 58 | 39 | 15 | 35 | 14 | 18/38 |
| 2005 | 6180 | 21740 | 2 | 61 | 37 | 8 | 23 | 26 | 18/38 |
| 2010 | 9420 | 2580 | 41 | 46 | 13 | 25 | 4 | 13 | 17/36 |
| 2015 | 12640 | 1820 | 32 | 59 | 9 | 45 | 42 | 17 | 17/38 |
| 2025 | 15440 | 260 | 6 | 74 | 20 | 28 | 16 | 48 | - / - |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 37/19 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 81/125 |
| 2015 | - | - | - | - | - | - | - | - | 37/81 |
| 2025 | 40 | - | 50 | 50 | 0 | 50 | 0 | 0 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | 360 | - | 6 | 89 | 6 | 0 | 0 | 6 | 39/71 |
| 2000 | 320 | - | 13 | 25 | 63 | 19 | 31 | 6 | 36/74 |
| 2005 | 400 | 720 | 40 | 55 | 5 | 0 | 0 | 10 | 41/98 |
| 2010 | 580 | 20 | 45 | 45 | 10 | 0 | 0 | 17 | 34/66 |
| 2015 | 360 | - | 28 | 61 | 11 | 11 | 0 | 11 | 30/62 |
| 2025 | 320 | - | 6 | 88 | 6 | 31 | 0 | 6 | - / - |
| Cercocarpus ledifolius[P] -- (curl-leaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/19 |
| 2000 | 340 | 40 | 12 | 29 | 59 | 0 | 24 | 71 | 5/14 |
| 2005 | 1520 | 420 | 93 | 7 | 0 | 0 | 0 | 0 | 20/26 |
| 2010 | 1040 | - | 79 | 21 | 0 | 0 | 0 | 0 | 17/23 |
| 2015 | 980 | - | 8 | 92 | 0 | 2 | 4 | 37 | 18/26 |
| 2025 | 520 | - | 0 | 77 | 23 | 35 | 19 | 54 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 30/28 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa ssp. nauseosa var. glabrata -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 300 | - | 20 | 80 | 0 | 0 | 0 | 0 | 22/27 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 50 | 100 | 28/15 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 240 | 380 | 8 | 92 | 0 | 0 | 0 | 0 | 18/16 |
| 2000 | 1680 | 60 | 7 | 93 | 0 | 0 | 0 | 0 | 9/12 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/22 |
| 2010 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/22 |
| 2015 | 160 | 160 | 38 | 63 | 0 | 0 | 0 | 25 | 14/20 |
| 2025 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 320 | - | 13 | 88 | 0 | 19 | 6 | 0 | 24/25 |
| 2000 | 120 | - | 0 | 83 | 17 | 33 | 67 | 33 | 8/11 |
| 2005 | 1860 | 2020 | 80 | 18 | 2 | 15 | 0 | 2 | 24/36 |
| 2010 | 2980 | 260 | 82 | 18 | 0 | 13 | 5 | 1 | 19/28 |
| 2015 | 2460 | - | 37 | 63 | 0 | 32 | 42 | 11 | 20/40 |
| 2025 | 1760 | - | 2 | 51 | 47 | 26 | 19 | 47 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/24 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/20 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/21 |
| 2015 | 40 | 20 | 0 | 100 | 0 | 0 | 0 | 50 | 10/15 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 1/3 |
| 2000 | 260 | - | 31 | 69 | 0 | 8 | 0 | 0 | 4/6 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 1/4 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/7 |
| 2015 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | 4/6 |
| 2025 | 140 | - | 57 | 43 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 100 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 100 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 60 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 40 | 40 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 67 | 0 | 33 | 0 | 0 | 33 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

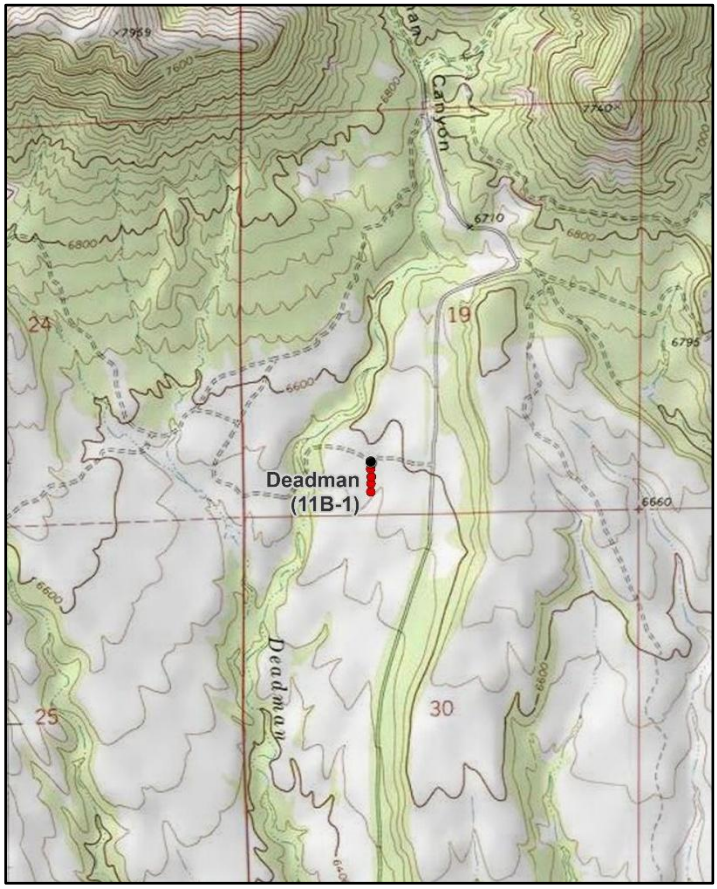
**Table 11A-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

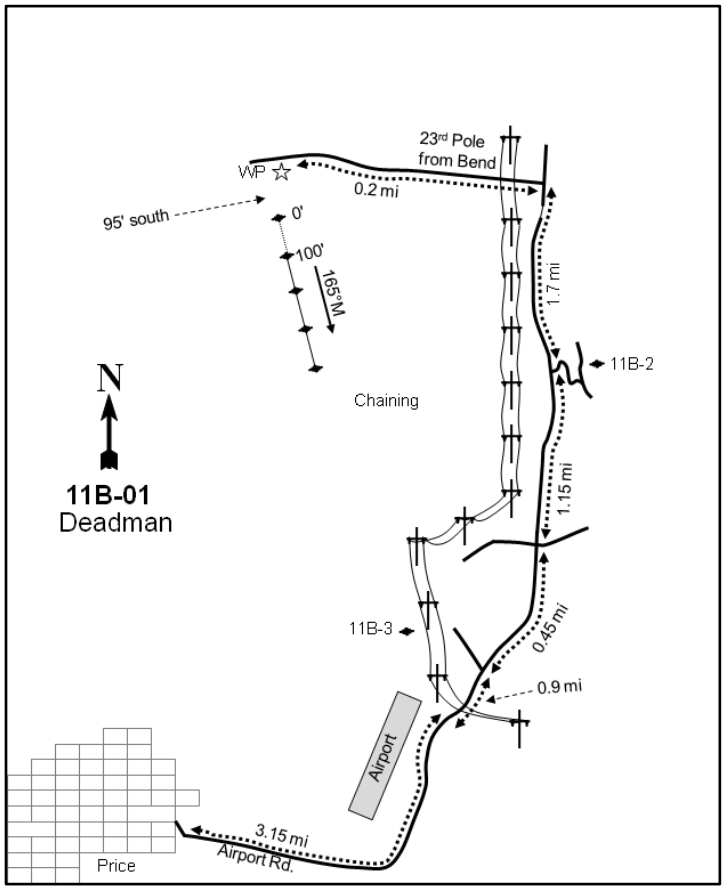
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 33 | - | - | - | - | - | 1.3 |
| 2015 | 4 | - | 100 | - | - | - | 3.8 |
| 2025 | 5 | 25 | 75 | - | - | - | 2.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 40 | - | - | - | - | - | 1.5 |
| 2015 | 21 | - | 78 | 22 | - | - | 4.2 |
| 2025 | 22 | - | 80 | 20 | - | - | 4.1 |

**Table 11A-05.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 21.5 | 11.6 | 7.9 | 13.3 | 0.0 | 1.4 | 0.0 | **55.7** | Fair |
| 2000 | 21.5 | 3.1 | 2.0 | 22.7 | 0.0 | 0.0 | 0.0 | **49.3** | Poor-Fair |
| 2005 | 18.9 | 6.3 | 6.4 | 30.0 | 0.0 | 2.5 | 0.0 | **64.1** | Fair-Good |
| 2010 | 14.5 | 11.2 | 15.0 | 30.0 | 0.0 | 1.5 | 0.0 | **72.2** | Good |
| 2015 | 21.1 | 12.3 | 15.0 | 30.0 | 0.0 | 1.2 | 0.0 | **79.6** | Good-Excellent |
| 2025 | 19.1 | 8.8 | 3.0 | 30.0 | 0.0 | 0.6 | 0.0 | **61.5** | Fair |

# DEADMAN - STUDY NO. 11B-1




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Deadman Canyon SW; Township 13S, Range 11E, Section 19 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 522861 East 4391842 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7854 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 1: 1ft, Belt 4: 8ft |

## Directions to Site

From the southeast end of Price, take Airport Road east for 3.2 miles to the airport. Continue 0.9 miles to a power line (and a left turn to the Airport transect). Proceed 0.5 miles to an intersection. Stay left on the main road and continue for 1.2 miles to a corral and a fork to the right which leads to the Airport Bench transect. There is a bend in the power line on the left; stay left and proceed up the main road another 1.7 miles (to the 23rd pole from the bend in the power line), then turn left. Proceed 0.2 miles, passing power pole #365, to a witness post on the left (south) side of the road in a chained area. The 0-foot stake is 95 feet south of the witness post and marked with browse tag #7854.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | COAL CREEK |
| Elevation | 6,600ft (2,012m) |
| Aspect | South |
| Slope | 0-3% |
| Sample Dates | 09/06/1994, 05/17/2000, 05/18/2005, 05/18/2010, 05/12/2015, 05/12/2020, 05/12/2025 |

**Table 11B-01.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Miller Creek Watershed Restoration 2.0 | 4734 | May-June 2020 | 2816 |
| Chaining - Chain Unknown | Coal Creek Seeding 1 1964 | LTDL 2526-6975 | July 1964-January 1965 | 1041 |
| Seeding - Aerial After | Coal Creek Seeding 1 1964 | LTDL 2526-6974 | July 1964-January 1965 | 1041 |
| Mechanical - Bullhog | West Coal Creek | 847 | Fall 2007 and Spring 2008 | 1868 |
| Seeding - Aerial Before | West Coal Creek | 847 | August 2007 and December 2007 | 1868 |

**Table 11B-01.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| West Coal Creek | | | Aerial | Aug 2007 | 1912 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Rimrock | 0.72 | 0.62 |
| G | Achnatherum hymenoides | Indian Ricegrass | Rimrock | 1.17 | 1.14 |
| G | Agropyron fragile | Siberian Wheatgrass | Vavilov | 1.35 | 1.16 |
| G | Bouteloua gracilis | Blue Grama | | 0.07 | 0.02 |
| G | Bouteloua gracilis | Blue Grama | | 0.26 | 0.25 |
| G | Elymus wawawaiensis | Snake River Wheatgrass | Secar | 1.35 | 1.09 |
| G | Leymus cinereus | Russian Wildrye | | 0.70 | 0.62 |
| G | Poa secunda | Big Bluegrass | Sherman | 0.05 | 0.04 |
| G | Psathyrostachys juncea | Russian Wildrye | | 0.80 | 0.64 |
| G | Sphaeralcea coccinea | Sand Dropseed | | 0.05 | 0.05 |
| G | Thinopyrum intermedium | Intermediate Wheatgrass | | 1.35 | 1.29 |
| F | Linum perenne | Blue Flax | Appar | 0.26 | 0.24 |
| F | Medicago sativa | Alfalfa | Ladak | 0.13 | 0.12 |
| F | Medicago sativa | Alfalfa | Ladak | 0.18 | 0.17 |
| F | Medicago sativa | Alfalfa | Ranger | 0.31 | 0.28 |
| F | Medicago sativa | Alfalfa | Spredor 4 | 0.16 | 0.15 |
| F | Medicago sativa | Alfalfa | Spredor 4 | 0.16 | 0.14 |
| F | Penstemon palmeri | Palmer Penstemon | Sanpete UT | 0.03 | 0.02 |
| F | Penstemon palmeri | Palmer Penstemon | Sanpete UT | 0.05 | 0.04 |
| S | Atriplex canescens | Fourwing Saltbush | Lincoln NV | 1.00 | 0.36 |
| S | Atriplex canescens | Fourwing Saltbush | Carbon UT | 0.21 | 0.08 |
| S | Bassia prostrata | Forage Kochia | Immigrant | 0.47 | 0.42 |
| S | Krascheninnikovia lanata | Winterfat | Iron UT | 0.07 | 0.03 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| | | | Aerial | Jul 1964 | 1041 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron desertorum | Crested Wheatgrass | | 7.60 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 0.40 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 0.60 | 0.00 |
| S | Purshia tridentata | Antelope Bitterbrush | | 0.05 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 11B-01.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Pronghorn | crucial | year-long |

**Table 11B-01.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Pinyon-Juniper | Phase I |
| 1994 | Pinyon-Juniper | Phase I |
| 2000 | Pinyon-Juniper | Phase I transitioning to Phase II |
| 2005 | Pinyon-Juniper | Phase II transitioning to Phase III |
| 2010 | Pinyon-Juniper/Annual Forb | Phase I |
| 2015 | Rubber Rabbitbrush | Early Phase I |
| 2020 | Rubber Rabbitbrush | Phase I |
| 2025 | Rubber Rabbitbrush | Phase I |

## Site Notes

No Notes

## Soils

**Table 11B-01.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.5 | 57.3 | 24.7 | 18.0 | 2.6 | 4.3 | 70.4 | 0.8 | 05/15/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Upland Stony Loam (Pinyon-Utah Juniper) |
| NRCS Ecological Site # | R034BY330UT |
| States and Transitions | 1986-2025 - Seeded State: Community Phase 4.2 |

From study establishment in 1986 through the 2005 sample year, twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) were the dominant plant species on this site (Photos, Pre-1992 Data). Both pinyon and juniper decreased substantially following a bullhog and seeding treatment in 2007 (Table 11B-01.1), causing the community to transition to one dominated by rubber rabbitbrush (*Ericameria nauseosa* ssp. *nauseosa* var. *hololeuca*). However, juniper has increased steadily since treatment, indicating that the site could possibly be infilled over time (Photos, Table 11B-01.12, Table 11B-01.13, Table 11B-01.14). The herbaceous understory was largely depauperate in the sample years preceding the 2007 bullhog treatment. The herbaceous understory diversified slightly following treatment, but still lacks in abundance as of 2025. The introduced annual grass species cheatgrass (*Bromus tectorum*) increased substantially in the 2020 sample year, but had a notable decrease in 2025. The annual forb species prickly Russian thistle (*Salsola tragus*) has fluctuated since 2005 (Table 11B-01.10, Table 11B-01.11).

Condition of deer winter range on this site has remained very poor in most sample years since 1994, but it was poor in 2015. The main factors negatively affecting winter range condition include a lack of recruitment of preferred browse; a lack of perennial grass and forb cover; and the presence of cheatgrass (Table 11B-01.7, Table 11B-01.10, Table 11B-01.13, Table 11B-01.15). Pellet transect data indicates that deer presence has been highly variable, ranging between low and high since 2000; deer presence was very high in 2025. During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Elk and cattle presence has remained low since study establishment. Preferred browse populations are too small to accurately assess the affects of wildlife utilization on the community. On-site observations in 2025 noted moderate utilization (20-40%) on Indian ricegrass (*Achnatherum hymenoides*), but little to no use of forbs (Photos, Table 11B-01.9, Table 11B-01.13).

## Trend Summary Tables

**Table 11B-01.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 1.9 | 0.5 | 7.7 | - | - | - |
| 2000 | 2.6 | 1.8 | 12.8 | - | - | - |
| 2005 | 1.7 | 0.1 | 16.4 | 1.6 | 0.1 | 27.1 |
| 2010 | 0.5 | 0.0 | 1.7 | 0.9 | 0.3 | 4.0 |
| 2015 | 5.7 | 0.9 | 1.5 | 7.6 | 0.8 | 3.5 |
| 2020 | 9.1 | 1.3 | 5.1 | 16.0 | 1.2 | 8.2 |
| 2025 | 5.0 | 4.0 | 4.4 | 11.8 | 6.0 | 7.4 |

**Table 11B-01.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 253 | 90 | 142 | - | 5.3 | 0.8 | 1.4 |
| 2000 | - | 262 | - | 128 | - | 4.4 | - | 1.6 |
| 2005 | - | 49 | 199 | 167 | - | 0.2 | 1.0 | 2.4 |
| 2010 | - | 16 | 320 | 114 | - | 0.9 | 7.7 | 2.0 |
| 2015 | 108 | 20 | 250 | 106 | 1.4 | 0.9 | 1.6 | 1.5 |
| 2020 | 387 | 24 | 76 | 74 | 16.2 | 0.8 | 0.3 | 0.4 |
| 2025 | 307 | 36 | 158 | 70 | 7.2 | 1.1 | 1.0 | 1.0 |

**Table 11B-01.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 28.9 | 0.2 | 30.0 | 4.0 | 8.8 | 17.2 |
| 2000 | 37.2 | 0.1 | 33.9 | 9.9 | 9.6 | 25.6 |
| 2005 | 41.5 | 0.5 | 36.5 | 8.5 | 8.7 | 20.5 |
| 2010 | 17.8 | 1.3 | 55.9 | 7.1 | 7.4 | 11.8 |
| 2015 | 25.4 | 0.2 | 55.3 | 8.1 | 7.5 | 15.6 |
| 2020 | 20.0 | 0.0 | 60.2 | 5.7 | 6.6 | 31.2 |
| 2025 | 28.9 | 0.0 | 57.0 | 7.7 | 5.5 | 24.2 |

**Table 11B-01.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit | Domestic Sheep |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1994 | - | - | 42 | 5 | 44 | - |
| 2000 | 2 | - | 15 | - | 23 | 1 |
| 2005 | - | - | 23 | - | 49 | - |
| 2010 | 2 | - | 24 | 1 | 9 | - |
| 2015 | 2 | - | 22 | 3 | 22 | - |
| 2020 | 1 | - | 45 | 3 | 46 | - |
| 2025 | 3 | - | 64 | 2 | 21 | - |
| Year | Days Use Per Acre (ha) | | | | | |
| 1994 | - | - | - | - | - | - |
| 2000 | 2.9 (7.2) | 8.7 (21.5)* | 18.7 (46.3) | - | - | 1.3 (3.3) |
| 2005 | 1.5 (3.6) | - | 60.3 (149.0) | - | - | - |
| 2010 | 5.8 (14.3) | - | 27.5 (67.9) | 20.1 (49.7) | - | - |
| 2015 | 5.1 (12.6) | - | 14.1 (34.8) | - | - | - |
| 2020 | 2.9 (7.2) | - | 55.6 (137.4) | - | - | - |
| 2025 | 3.6 (9.0) | - | 160.9 (397.3) | 2.7 (6.6) | - | - |

*Pellets per acre (ha)

**Table 11B-01.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Aristida purpurea (purple threeawn) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Sporobolus cryptandrus (sand dropseed) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1994 | 8 | 247 | 4 | - | - | - | - |
| 2000 | 10 | 261 | 1 | - | - | - | - |
| 2005 | 8 | 40 | - | 1 | - | - | - |
| 2010 | 7 | 4 | 5 | - | - | - | - |
| 2015 | 6 | 13 | - | - | 108 | - | 1 |
| 2020 | 8 | 8 | 1 | - | 387 | 5 | 2 |
| 2025 | 7 | 25 | - | - | 307 | 4 | 2 |
| year | Average Cover (%) | | | | | | |
| 1994 | 0.1 | 5.1 | 0.0 | - | - | - | - |
| 2000 | 0.1 | 4.1 | 0.1 | - | - | - | - |
| 2005 | 0.0 | 0.1 | - | 0.0 | - | - | - |
| 2010 | 0.3 | 0.2 | 0.4 | - | - | - | - |
| 2015 | 0.3 | 0.6 | - | - | 1.4 | - | 0.0 |
| 2020 | 0.3 | 0.4 | 0.0 | - | 16.2 | 0.0 | 0.0 |
| 2025 | 0.5 | 0.5 | - | - | 7.2 | 0.0 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-01.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Chamaesyce fendleri (Fendler's sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha[a] (annual cryptantha) | Cryptantha fulvocanescens (tawny cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum alatum (winged buckwheat) | Eriogonum cernuum[a] (nodding buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gilia inconspicua[a] (shy gilia) | Hackelia patens (spotted stickseed) | Ipomopsis aggregata (scarlet gilia) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lithospermum multiflorum (manyflowered stoneseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | 0 | 25 | 2 | - | - | 46 | 5 | - | - | 16 | - | - | 9 | - | - | 2 |
| 2000 | - | 1 | 34 | - | - | - | 53 | - | 5 | - | 15 | - | - | - | - | - | - |
| 2005 | - | - | 15 | 93 | - | - | 76 | 22 | 0 | 118 | 9 | 3 | - | 8 | - | 1 | 1 |
| 2010 | 9 | - | - | - | - | - | 11 | 1 | 39 | 203 | 11 | - | - | 2 | 73 | - | - |
| 2015 | - | - | 74 | 17 | 2 | 3 | 7 | 20 | - | 27 | 6 | - | 2 | 1 | 2 | 10 | 1 |
| 2020 | 3 | - | 31 | 9 | - | 1 | 3 | - | - | 27 | 8 | - | - | - | - | 37 | - |
| 2025 | 14 | - | 7 | 11 | - | 11 | 4 | 47 | - | - | 1 | 3 | 4 | 1 | - | 56 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | 0.0 | 0.1 | 0.0 | - | - | 0.6 | 0.0 | - | - | 0.1 | - | - | 0.0 | - | - | 0.0 |
| 2000 | - | 0.0 | 0.1 | - | - | - | 1.0 | - | 0.0 | - | 0.1 | - | - | - | - | - | - |
| 2005 | - | - | 0.0 | 0.3 | - | - | 0.6 | 0.3 | 0.0 | 0.4 | 0.0 | 0.0 | - | 0.1 | - | 0.0 | 0.0 |
| 2010 | 0.0 | - | - | - | - | - | 0.4 | 0.0 | 0.2 | 3.4 | 0.2 | - | - | 0.0 | 0.8 | - | - |
| 2015 | - | - | 0.3 | 0.0 | 0.0 | 0.0 | 0.4 | 0.2 | - | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 |
| 2020 | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.0 | - | - | 0.1 | 0.1 | - | - | - | - | 0.1 | - |
| 2025 | 0.1 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.4 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.3 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Oenothera (evening primrose) | Penstemon caespitosus (mat penstemon) | Penstemon cyanocaulis (bluestem beardtongue) | Physaria ludoviciana (foothill bladderpod) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1994 | 21 | 5 | 5 | - | 3 | 29 | 22 | 84 | - | 22 | 8 | - |
| 2000 | 1 | - | - | - | - | 16 | 2 | - | - | 17 | 12 | - |
| 2005 | 3 | - | - | - | - | 105 | 3 | 18 | - | 21 | - | - |
| 2010 | 41 | - | - | - | - | 11 | - | 232 | - | 9 | - | - |
| 2015 | - | - | - | 3 | - | - | 21 | 230 | 0 | 12 | - | - |
| 2020 | 6 | - | - | - | 2 | 8 | 10 | 19 | - | 14 | 1 | 7 |
| 2025 | 5 | - | - | - | - | 3 | 8 | 77 | - | 28 | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1994 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.1 | 0.8 | - | 0.1 | 0.0 | - |
| 2000 | 0.0 | - | - | - | - | 0.1 | 0.0 | - | - | 0.2 | 0.0 | - |
| 2005 | 0.0 | - | - | - | - | 1.5 | 0.0 | 0.0 | - | 0.0 | - | - |
| 2010 | 0.2 | - | - | - | - | 0.8 | - | 3.5 | - | 0.2 | - | - |
| 2015 | - | - | - | 0.0 | - | - | 0.3 | 1.1 | 0.0 | 0.5 | - | - |
| 2020 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 |
| 2025 | 0.2 | - | - | - | - | 0.1 | 0.0 | 0.2 | - | 0.6 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-01.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Ephedra viridis[p] (mormon tea) | Ericameria nauseosa ssp. consimilis var. arenaria (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 0.7 | 0.9 | - | 0 | 0.1 | 9.4 | - | 17.7 | - |
| 2010 | - | 0.1 | 0.8 | - | 0 | 0.3 | 2.8 | - | 1.2 | - |
| 2015 | - | 0.7 | 0.5 | - | 6.4 | 0.8 | 3.5 | - | - | - |
| 2020 | 0.5 | 0.8 | 0.8 | 0.2 | 13.9 | 0.9 | 8.2 | 0.1 | - | - |
| 2025 | 0.6 | 0.9 | 1 | 1.1 | 9.3 | 4.7 | 7.4 | 0.2 | - | - |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1994 | - | 1.4 | 0.0 | - | 0.0 | 0.5 | 3.3 | 0.0 | 4.4 | 0.4 |
| 2000 | - | 2.0 | 0.2 | - | 0.4 | 1.8 | 5.6 | 0.0 | 7.2 | 0.0 |
| 2005 | 0.0 | 1.4 | 0.3 | - | 0.0 | 0.0 | 6.8 | 0.1 | 9.6 | - |
| 2010 | - | 0.1 | 0.2 | - | 0.1 | 0.0 | 1.5 | - | 0.1 | - |
| 2015 | 0.0 | 0.8 | 0.2 | - | 4.8 | 0.9 | 1.5 | - | - | - |
| 2020 | 0.0 | 1.1 | 0.4 | 0.0 | 7.6 | 1.3 | 5.1 | 0.0 | - | 0.0 |
| 2025 | 0.1 | 1.0 | 0.1 | 0.3 | 3.7 | 3.7 | 4.4 | 0.0 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-01.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | 16/14 |
| 2000 | - | - | - | - | - | - | - | - | 73/157 |
| 2005 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 30/32 |
| 2020 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 42/59 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1994 | 100 | - | 0 | 100 | 0 | 40 | 0 | 0 | 139/148 |
| 2000 | 100 | - | 0 | 100 | 0 | 20 | 60 | 0 | 123/155 |
| 2005 | 80 | 20 | 0 | 0 | 100 | 0 | 100 | 0 | 106/123 |
| 2010 | 40 | 20 | 50 | 0 | 50 | 0 | 50 | 50 | 68/95 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 100 | 50 | 48/73 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 73/104 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Echinocereus -- (hedgehog cactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 8/14 |
| 2020 | - | - | - | - | - | - | - | - | 5/17 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1994 | 180 | - | 56 | 44 | 0 | 0 | 0 | 0 | 59/70 |
| 2000 | 160 | - | 13 | 63 | 25 | 13 | 75 | 13 | 74/107 |
| 2005 | 320 | - | 6 | 81 | 13 | 13 | 0 | 0 | 78/103 |
| 2010 | 260 | - | 39 | 54 | 8 | 8 | 39 | 8 | 39/61 |
| 2015 | 180 | - | 22 | 67 | 11 | 0 | 89 | 11 | 29/56 |
| 2020 | 140 | - | 0 | 100 | 0 | 14 | 86 | 0 | 40/83 |
| 2025 | 160 | - | 0 | 50 | 50 | 0 | 100 | 50 | - / - |
| Ericameria nauseosa ssp. consimilis var. arenaria -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 140 | - | 0 | 100 | 0 | 0 | 57 | 0 | 53/71 |
| 2025 | 80 | - | 0 | 100 | 0 | 25 | 50 | 25 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 52/49 |
| 2000 | 140 | 100 | 14 | 43 | 43 | 14 | 57 | 29 | 60/56 |
| 2005 | 80 | - | 0 | 50 | 50 | 0 | 100 | 50 | 39/50 |
| 2010 | 240 | 20 | 67 | 33 | 0 | 8 | 8 | 0 | 41/44 |
| 2015 | 2220 | 220 | 39 | 60 | 2 | 28 | 35 | 6 | 55/74 |
| 2020 | 2080 | - | 3 | 92 | 5 | 22 | 7 | 10 | 66/91 |
| 2025 | 1900 | - | 0 | 58 | 42 | 54 | 27 | 47 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 760 | 40 | 3 | 97 | 0 | 0 | 0 | 0 | 20/21 |
| 2000 | 9380 | 120 | 9 | 87 | 4 | 0 | 0 | 1 | 14/15 |
| 2005 | 520 | 80 | 92 | 4 | 4 | 0 | 4 | 4 | 8/14 |
| 2010 | 200 | - | 20 | 80 | 0 | 0 | 0 | 0 | 11/20 |
| 2015 | 2100 | 180 | 47 | 53 | 0 | 3 | 0 | 0 | 13/19 |
| 2020 | 6040 | 160 | 34 | 65 | 1 | 0 | 0 | 2 | 11/16 |
| 2025 | 13160 | - | 6 | 94 | 0 | 1 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 260 | - | 69 | 31 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 400 | - | 55 | 45 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 100 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 240 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 220 | - | 73 | 27 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1994 | 140 | - | 0 | 86 | 14 | 0 | 0 | 0 | 7/36 |
| 2000 | 180 | 20 | 22 | 56 | 22 | 0 | 0 | 22 | 8/36 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/29 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/27 |
| 2015 | - | - | - | - | - | - | - | - | 8/28 |
| 2020 | 100 | - | 0 | 0 | 100 | 0 | 0 | 100 | 7/32 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 180 | - | 11 | 89 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 140 | - | 0 | 100 | 0 | 0 | 0 | 14 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Purshia stansburiana[p] -- (Stansbury cliffrose) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 260/190 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | 60 | - | 0 | 100 | 0 | 67 | 0 | 0 | 15/30 |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 83/184 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 57/161 |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 67/239 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

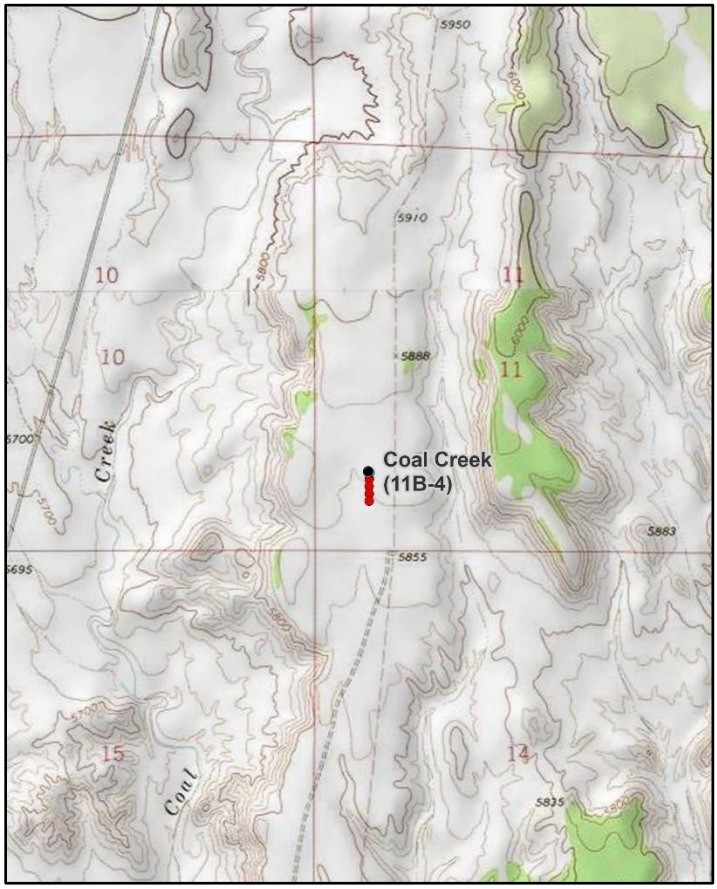
**Table 11B-01.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

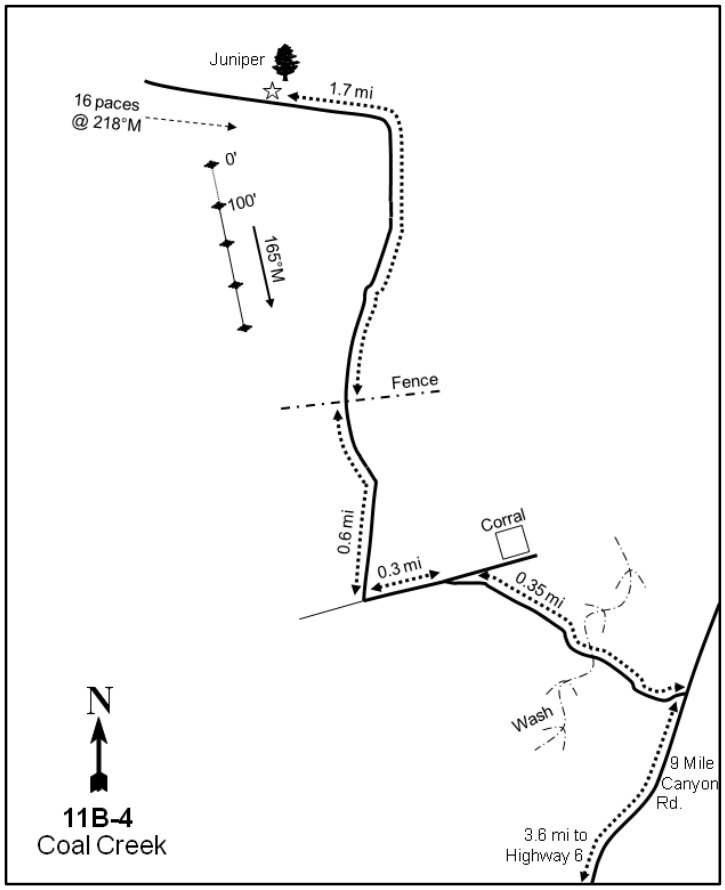
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Cercocarpus montanus (alderleaf mountain mahogany) | | | | | | | |
| 2010 | 36 | - | 83 | 17 | - | - | 1.9 |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1994 | 208 | - | - | - | - | - | 5.1 |
| 2000 | 184 | - | - | - | - | - | 5.4 |
| 2005 | 212 | - | 10 | 50 | 20 | 20 | 10.9 |
| 2010 | 22 | - | 64 | 18 | - | 18 | 6.9 |
| 2015 | 74 | 56 | 22 | 17 | 6 | - | 3.3 |
| 2020 | 124 | 47 | 37 | 11 | 5 | - | 6.1 |
| 2025 | 107 | 35 | 50 | 5 | - | 10 | 5.3 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1994 | 106 | - | - | - | - | - | 7.0 |
| 2000 | 109 | - | - | - | - | - | 9.3 |
| 2005 | 118 | - | - | 40 | 35 | 25 | 13.8 |
| 2010 | 5 | - | - | 100 | - | - | 9.7 |
| 2015 | 7 | - | 40 | 60 | - | - | 7.6 |
| 2020 | 9 | - | 50 | 50 | - | - | 7.7 |
| 2025 | 6 | - | - | 75 | 25 | - | 11.8 |

**Table 11B-01.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 2.8 | 0.0 | 0.0 | 10.5 | 0.0 | 2.7 | 0.0 | **16.0** | Very Poor |
| 2000 | 3.8 | 0.0 | 0.0 | 8.7 | 0.0 | 3.3 | 0.0 | **15.8** | Very Poor |
| 2005 | 2.2 | 0.0 | 0.0 | 0.3 | 0.0 | 4.8 | 0.0 | **7.3** | Very Poor |
| 2010 | 1.2 | 0.0 | 0.0 | 1.8 | 0.0 | 4.0 | 0.0 | **7.0** | Very Poor |
| 2015 | 9.7 | 14.4 | 15.0 | 1.8 | -1.1 | 3.1 | 0.0 | **42.9** | Poor |
| 2020 | 20.2 | 13.9 | 1.3 | 1.5 | -12.1 | 0.9 | 0.0 | **25.7** | Very Poor |
| 2025 | 15.0 | 3.8 | 0.0 | 2.1 | -5.4 | 2.1 | 0.0 | **17.6** | Very Poor |

# COAL CREEK - STUDY NO. 11B-4




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Wellington NE; Township 14S, Range 11E, Section 11 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 529044 East 4385450 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7839 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from Highway U.S. 6 east of Wellington, turn northeast on Soldier Creek Road (9 Mile Canyon). Stay on this road for 3.6 miles, then turn left onto a dirt road. Go 0.4 miles to a fork near a corral. From the fork, proceed 0.3 miles to another fork. Turn right and continue 0.6 miles to a wire gate. Go through the gate and drive 1.7 miles to a small Utah juniper (*Juniperus osteosperma*) tree 20 feet from the right (north) side of the road. The transect baseline starts 16 paces from the juniper at a bearing of 218 degrees magnetic. Browse tag #7839 marks the 0-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SOLDIERS CANYON |
| Elevation | 5,860ft (1,786m) |
| Aspect | South |
| Slope | 2% |
| Sample Dates | 09/01/1994, 05/18/2000, 05/19/2005, 05/19/2010, 05/28/2015, 08/17/2020, 05/13/2025 |

**Table 11B-04.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Carbon and Emery County Habitat Restoration and Maintenance (Proposed) | 6706 | 2025 | 5824 |

## Wildlife Habitat and Vegetation History

**Table 11B-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | substantial | winter |
| Pronghorn | crucial | year-long |

**Table 11B-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush | Early Phase I |
| 1994 | Wyoming Big Sagebrush | Early Phase I |
| 2000 | Wyoming Big Sagebrush | Early Phase I |
| 2005 | Wyoming Big Sagebrush | Early Phase I |
| 2010 | Wyoming Big Sagebrush | Early Phase I |
| 2015 | Wyoming Big Sagebrush | Early Phase I |
| 2020 | Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 11B-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.5 | 54.0 | 22.0 | 24.0 | 1.0 | 6.4 | 140.8 | 0.6 | 05/18/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 9 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1986-2010 - Reference State: Community Phase 1.2<br>2015-2025 - Current Potential State: Community Phase 2.2 |

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has dominated this site since the study was established in 1986, and although cover has fluctuated over the sample years, the community remains stable as of 2025 (Photos, Pre-1992 Data, Table 11B-04.12, Table 11B-04.13). The herbaceous understory has been mainly composed of native perennial grass species. Although there is some diversity among the grass species, they have generally remained rare throughout the study period. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been present since 2015, but cover and abundance have remained minimal (Table 11B--04.10). Despite the low cover of cheatgrass, its presence signifies a transition in community structure that is less resilient to disturbance. Forbs have remained diverse, but not abundant (Table 11B-04.11). Utah juniper (*Juniperus osteosperma*) has been observed on the site since study establishment. However, tree encroachment appears to be slow with density and size remaining stable; the site has been considered to be within Early Phase I of woodland succession throughout the study period (Photos, Table 11B-04.4, Table 11B-04.13, Table 11B-04.14).

Mule deer winter range conditions have varied between fair and good since 1994. Winter habitat condition was considered fair in 2025, and was limited by low preferred browse cover and recruitment, and very low perennial grass and forb cover (Table 11B-04.6, Table 11B-04.7, Table 11B-04.13, Table 11B-04.15). Mule deer pellet groups have been absent in most sample years, but presence was low in 2005 and high in 2020. Elk presence remained low since 2000. Cattle have had a similar presence to elk (Table 11B-04.9). Utilization of Wyoming big sagebrush has remained light in most sample years, but was at its heaviest in 2015 with 17% of the population being moderately browsed and 40% being heavily hedged (Table 11B-04.13). On-site observations noted little to no use on the herbaceous community in 2025. It should be noted that this community is susceptible to severe drought, and if combined with heavy utilization, this could lead to a decrease in preferred browse abundance and loss of utility for wildlife.

## Trend Summary Tables

**Table 11B-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 15.5 | 4.4 | - | - | - | - |
| 2000 | 16.8 | 5.8 | - | - | - | - |
| 2005 | 14.3 | 1.9 | - | 14.6 | 1.2 | - |
| 2010 | 16.2 | 1.5 | - | 14.5 | 0.4 | - |
| 2015 | 14.5 | 3.2 | 0.0 | 13.1 | 2.1 | - |
| 2020 | 16.1 | 5.7 | 0.0 | 17.8 | 3.0 | 0.1 |
| 2025 | 16.7 | 7.3 | 0.6 | 16.2 | 4.2 | 0.5 |

**Table 11B-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 118 | 38 | 11 | - | 2.6 | 0.1 | 0.2 |
| 2000 | - | 180 | 4 | 6 | - | 4.2 | 0.0 | 0.0 |
| 2005 | - | 197 | 189 | 16 | - | 6.4 | 2.0 | 0.2 |
| 2010 | - | 166 | 19 | 8 | - | 6.7 | 0.2 | 0.1 |
| 2015 | 4 | 182 | 72 | 20 | 0.0 | 6.5 | 0.8 | 0.1 |
| 2020 | 2 | 103 | 98 | 4 | 0.0 | 2.4 | 1.0 | 0.0 |
| 2025 | 8 | 125 | 29 | 14 | 0.0 | 2.5 | 0.1 | 0.1 |

**Table 11B-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 35.1 | 3.3 | 20.0 | 4.2 | 10.4 | 21.5 |
| 2000 | 46.9 | 10.9 | 17.4 | 17.4 | 1.8 | 28.1 |
| 2005 | 47.4 | 5.9 | 22.1 | 11.6 | 2.1 | 22.9 |
| 2010 | 42.4 | 4.8 | 27.6 | 15.5 | 2.3 | 25.2 |
| 2015 | 46.3 | 5.1 | 23.8 | 18.6 | 3.0 | 23.1 |
| 2020 | 29.7 | 6.6 | 33.6 | 25.4 | 1.4 | 23.3 |
| 2025 | 43.1 | 5.0 | 28.4 | 17.6 | 1.1 | 27.6 |

**Table 11B-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1994 | - | - | 15 | - | 45 |
| 2000 | - | - | 3 | 1 | 39 |
| 2005 | - | - | 3 | - | 60 |
| 2010 | - | - | 4 | - | 44 |
| 2015 | - | - | 3 | - | 31 |
| 2020 | - | - | 2 | - | 21 |
| 2025 | - | - | - | - | 43 |
| Year | Days Use Per Acre (ha) | | | | |
| 1994 | - | - | - | - | - |
| 2000 | - | - | 4.0 (9.9) | - | - |
| 2005 | 0.7 (1.8) | 8.7 (21.5)* | 6.7 (16.6) | - | - |
| 2010 | 2.9 (7.2) | - | 4.0 (9.9) | - | - |
| 2015 | 1.5 (3.6) | - | 1.3 (3.3) | - | - |
| 2020 | - | 61.0 (150.6)* | 14.7 (36.4) | - | - |
| 2025 | 0.7 (1.8) | - | 0.7 (1.7) | - | - |

*Pellets per acre (ha)

**Table 11B-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Aristida purpurea (purple threeawn) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1994 | 9 | 12 | 45 | - | 18 | 16 | 39 | 3 | - |
| 2000 | 16 | 7 | 77 | - | 70 | 33 | 6 | - | - |
| 2005 | 20 | 11 | 46 | - | 73 | 74 | 29 | - | - |
| 2010 | 14 | - | 79 | - | 61 | 32 | 17 | - | - |
| 2015 | 4 | 5 | 103 | 4 | 15 | 100 | - | - | - |
| 2020 | 3 | - | 50 | 2 | 2 | 38 | 31 | - | - |
| 2025 | - | - | 50 | 6 | 16 | 68 | 12 | - | 6 |
| year | Average Cover (%) | | | | | | | | |
| 1994 | 0.0 | 0.1 | 1.0 | - | 0.2 | 0.6 | 0.7 | 0.0 | - |
| 2000 | 0.4 | 0.2 | 1.9 | - | 0.8 | 0.8 | 0.2 | - | - |
| 2005 | 0.1 | 0.2 | 1.5 | - | 2.1 | 1.9 | 0.6 | - | - |
| 2010 | 0.3 | - | 2.8 | - | 2.1 | 0.9 | 0.6 | - | - |
| 2015 | 0.1 | 0.2 | 2.2 | 0.0 | 0.4 | 3.6 | - | - | - |
| 2020 | 0.0 | - | 1.4 | 0.0 | 0.0 | 0.9 | 0.1 | - | - |
| 2025 | - | - | 1.0 | 0.0 | 0.1 | 1.3 | 0.1 | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Astragalus convallarius (lesser rushy milkvetch) | Brassicaceae[a] (mustard family) | Chaetopappa ericoides (rose heath) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha gracilis[a] (narrowstem cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Eriogonum cernuum[a] (nodding buckwheat) | Eriogonum ovalifolium (cushion buckwheat) | Gilia inconspicua[a] (shy gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Navarretia intertexta[a] (needleleaf navarretia) | Oenothera (evening primrose) | Plantago patagonica[a] (woolly plantain) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 2 | 4 | 5 | - | - | 3 | - | - | - | 2 | 3 | - | 4 | 26 | - | - | - |
| 2000 | - | - | 5 | - | - | - | - | - | - | - | 1 | - | - | 4 | - | - | - |
| 2005 | 0 | - | 9 | 36 | 10 | 4 | - | 65 | - | 43 | - | 82 | 8 | 27 | - | 3 | - |
| 2010 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | 19 | - | - | - |
| 2015 | 2 | - | 2 | - | - | - | - | 59 | 3 | - | - | - | 5 | 4 | 3 | - | 1 |
| 2020 | - | - | - | - | - | - | 1 | 89 | 2 | 8 | - | - | 1 | - | - | - | 1 |
| 2025 | 3 | - | 2 | - | - | 4 | - | 8 | - | - | - | - | 12 | 10 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.0 | 0.0 | 0.2 | - | - | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.1 | - | - | - |
| 2000 | - | - | 0.0 | - | - | - | - | - | - | - | 0.0 | - | - | 0.0 | - | - | - |
| 2005 | 0.0 | - | 0.1 | 0.1 | 0.0 | 0.0 | - | 0.7 | - | 0.1 | - | 0.3 | 0.0 | 0.8 | - | 0.0 | - |
| 2010 | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - |
| 2015 | 0.0 | - | 0.0 | - | - | - | - | 0.8 | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | 0.0 |
| 2020 | - | - | - | - | - | - | 0.0 | 0.9 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | 0.0 |
| 2025 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | - | - | - | - | 0.0 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|
| year | Nested Frequency | | |
| 1994 | 1 | - | - |
| 2000 | - | - | - |
| 2005 | 4 | - | - |
| 2010 | 6 | - | - |
| 2015 | 8 | 1 | 7 |
| 2020 | 3 | - | - |
| 2025 | 5 | - | 6 |
| year | Average Cover (%) | | |
| 1994 | 0.0 | - | - |
| 2000 | - | - | - |
| 2005 | 0.1 | - | - |
| 2010 | 0.0 | - | - |
| 2015 | 0.0 | 0.0 | 0.0 |
| 2020 | 0.0 | - | - |
| 2025 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Echinocereus coccineus (scarlet hedgehog cactus) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | 14.2 | 0.4 | - | 0.3 | - | 0.8 | - | 0.1 | - |
| 2010 | 14.5 | - | - | 0.2 | - | 0.1 | - | 0.1 | - |
| 2015 | 13 | - | 0.1 | 0.4 | - | 1.5 | - | 0.1 | 0.1 |
| 2020 | 17.8 | - | - | 0.1 | - | 2.9 | 0.1 | - | - |
| 2025 | 16.2 | - | - | 1 | - | 3.1 | 0.5 | - | 0.1 |
| year | Quadrat Cover (%) | | | | | | | | |
| 1994 | 15.0 | 0.5 | - | 1.6 | - | 2.2 | - | 0.3 | 0.3 |
| 2000 | 16.5 | 0.3 | - | 0.7 | 0.0 | 4.4 | - | 0.3 | 0.5 |
| 2005 | 13.8 | 0.4 | - | 0.7 | - | 1.0 | - | 0.2 | 0.0 |
| 2010 | 16.2 | 0.0 | - | 0.9 | - | 0.3 | - | 0.2 | 0.2 |
| 2015 | 14.4 | 0.0 | 0.0 | 0.5 | - | 2.4 | 0.0 | 0.2 | 0.2 |
| 2020 | 16.1 | - | - | 0.3 | - | 5.2 | 0.0 | 0.2 | 0.1 |
| 2025 | 16.7 | - | - | 0.3 | - | 6.7 | 0.6 | 0.0 | 0.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1994 | 2900 | 2860 | 3 | 73 | 24 | 12 | 5 | 9 | 50/80 |
| 2000 | 5560 | 2020 | 41 | 36 | 22 | 16 | 3 | 11 | 58/91 |
| 2005 | 2940 | 294680 | 7 | 22 | 71 | 27 | 6 | 40 | 58/86 |
| 2010 | 4680 | 2500 | 38 | 36 | 27 | 22 | 2 | 18 | 56/91 |
| 2015 | 5100 | 240 | 36 | 40 | 24 | 17 | 40 | 28 | 47/85 |
| 2020 | 4280 | - | 26 | 45 | 29 | 18 | 1 | 29 | 53/88 |
| 2025 | 5340 | - | 6 | 72 | 22 | 8 | 2 | 21 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 44/36 |
| 2010 | - | - | - | - | - | - | - | - | 40/34 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex confertifolia[p] -- (shadscale saltbush) | | | | | | | | | |
| 1994 | 600 | - | 0 | 60 | 40 | 7 | 7 | 7 | 24/33 |
| 2000 | 540 | - | 4 | 26 | 70 | 7 | 52 | 70 | 21/35 |
| 2005 | 240 | 40 | 33 | 58 | 8 | 8 | 25 | 0 | 36/43 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/21 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 100 | 4/13 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 220 | - | 0 | 82 | 18 | 36 | 64 | 0 | 18/38 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | 1740 | 20 | 0 | 75 | 25 | 1 | 7 | 12 | 16/29 |
| 2000 | 1360 | 20 | 2 | 10 | 88 | 2 | 6 | 74 | 10/20 |
| 2005 | 740 | - | 0 | 70 | 30 | 5 | 5 | 11 | 18/28 |
| 2010 | 540 | - | 22 | 63 | 15 | 0 | 0 | 11 | 16/26 |
| 2015 | 500 | - | 4 | 84 | 12 | 32 | 16 | 16 | 20/29 |
| 2020 | 320 | - | 0 | 50 | 50 | 6 | 13 | 69 | 17/26 |
| 2025 | 620 | - | 0 | 81 | 19 | 16 | 19 | 23 | - / - |
| Echinocereus coccineus -- (scarlet hedgehog cactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/31 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/22 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/25 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/29 |
| 2020 | 240 | - | 33 | 67 | 0 | 0 | 0 | 0 | 7/25 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 6280 | 20 | 12 | 81 | 8 | 0 | 0 | 5 | 20/19 |
| 2000 | 26900 | 100 | 4 | 88 | 8 | 0 | 0 | 4 | 11/13 |
| 2005 | 1360 | 120 | 0 | 100 | 0 | 0 | 0 | 0 | 21/23 |
| 2010 | 640 | - | 16 | 81 | 3 | 0 | 0 | 3 | 14/18 |
| 2015 | 6420 | 300 | 35 | 65 | 0 | 0 | 0 | 0 | 18/22 |
| 2020 | 35440 | 580 | 35 | 64 | 1 | 0 | 0 | 1 | 14/14 |
| 2025 | 16960 | 20 | 24 | 75 | 2 | 0 | 0 | 2 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1994 | 60 | - | 33 | 33 | 33 | 33 | 0 | 33 | 17/21 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 15/31 |
| 2010 | - | - | - | - | - | - | - | - | 15/29 |
| 2015 | - | - | - | - | - | - | - | - | 17/29 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1994 | 440 | - | 0 | 96 | 5 | 0 | 0 | 5 | 9/22 |
| 2000 | 700 | 40 | 9 | 9 | 83 | 0 | 40 | 20 | 22/18 |
| 2005 | 260 | - | 0 | 77 | 23 | 0 | 0 | 8 | 12/19 |
| 2010 | 280 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/15 |
| 2015 | 260 | - | 0 | 54 | 46 | 0 | 0 | 46 | 10/17 |
| 2020 | 220 | - | 0 | 82 | 18 | 0 | 9 | 9 | 14/23 |
| 2025 | 300 | - | 0 | 7 | 93 | 7 | 0 | 93 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1994 | 1060 | - | 2 | 96 | 2 | 0 | 0 | 0 | 8/27 |
| 2000 | 1220 | - | 0 | 67 | 33 | 0 | 0 | 13 | 9/24 |
| 2005 | 220 | - | 0 | 27 | 73 | 0 | 0 | 64 | 11/24 |
| 2010 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/31 |
| 2015 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/36 |
| 2020 | 160 | - | 13 | 75 | 13 | 0 | 0 | 13 | 9/29 |
| 2025 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 14/28 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

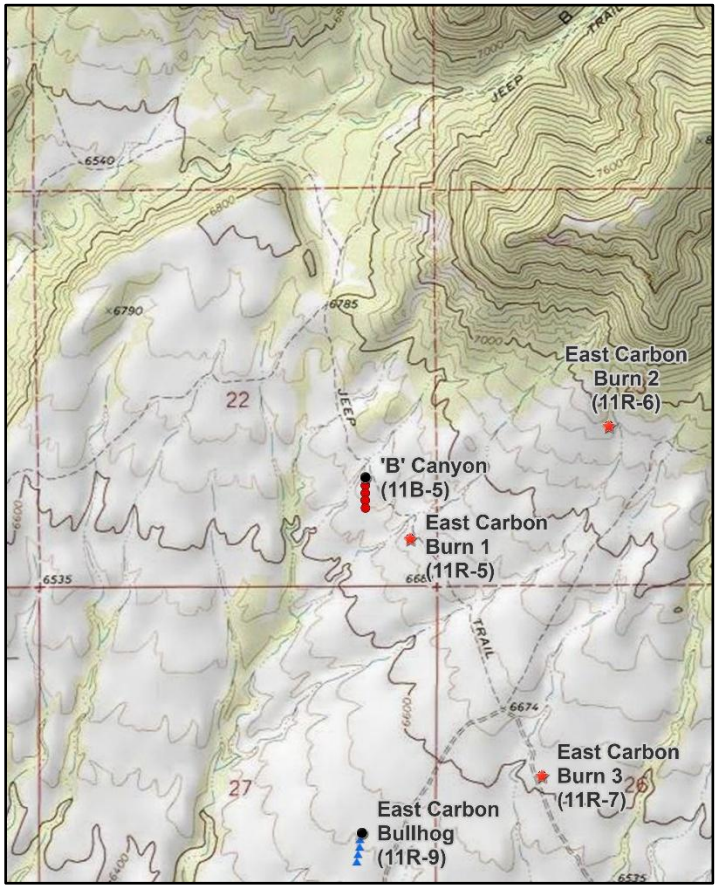
**Table 11B-04.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

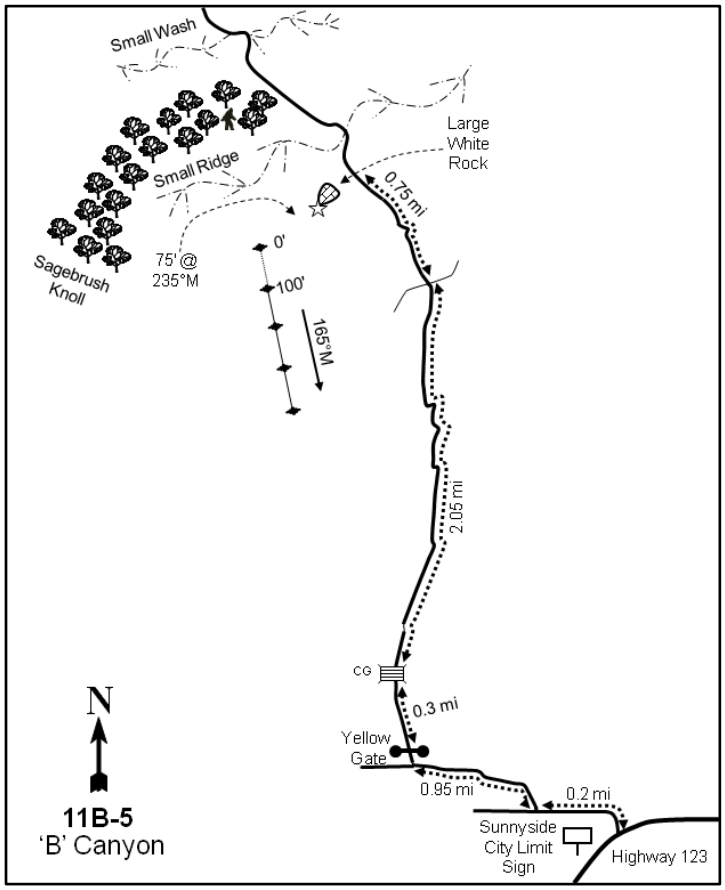
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 13 | - | 22 | 56 | 22 | - | 10.9 |
| 2020 | 17 | - | 22 | 67 | 11 | - | 8.6 |
| 2025 | 16 | - | 11 | 67 | 11 | 11 | 12.0 |

**Table 11B-04.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 19.2 | 7.6 | 1.4 | 5.2 | 0.0 | 0.4 | 0.0 | **33.8** | Fair |
| 2000 | 20.9 | 8.0 | 15.0 | 8.5 | 0.0 | 0.1 | 0.0 | **52.5** | Good |
| 2005 | 18.2 | -5.7 | 3.8 | 12.8 | 0.0 | 0.3 | 0.0 | **29.4** | Fair |
| 2010 | 18.1 | 7.1 | 15.0 | 13.3 | 0.0 | 0.1 | 0.0 | **53.6** | Good |
| 2015 | 16.4 | 7.8 | 15.0 | 13.0 | 0.0 | 0.3 | 0.0 | **52.5** | Good |
| 2020 | 22.3 | 6.2 | 12.9 | 4.8 | 0.0 | 0.0 | 0.0 | **46.2** | Fair-Good |
| 2025 | 20.3 | 8.4 | 3.2 | 5.0 | 0.0 | 0.2 | 0.0 | **37.1** | Fair |

# 'B' CANYON - STUDY NO. 11B-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Sunnyside NW; Township 14S, Range 13E, Section 22 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 547929 East 4382377 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7894 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Sunnyside city limit sign on State Route 123 at the west end of town, turn north and go 0.2 miles, passing the East Carbon High School football field. Turn right and travel 1.0 miles. Turn right again and pass through a yellow metal gate, continuing 0.3 miles to a cattle guard. Stay on the main road and drive north 2.1 miles to an intersection. Keep left at the intersection (right turn goes to A Canyon transect) and go 0.8 miles more to the top of the ridge. On the left (west) side of the road there will be a rock. The 0-foot stake, marked by a red-painted rebar (browse tag #7894), is 75 feet away at a bearing of 235 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | MUD SPRINGS |
| Elevation | 6,700ft (2,042m) |
| Aspect | South-Southwest |
| Slope | 5-7% |
| Sample Dates | 09/01/1994, 05/18/2000, 05/20/2005, 05/20/2010, 05/13/2015, 05/13/2020, 05/14/2025 |

**Table 11B-05.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial Unknown | East Carbon Fire Rehabilitation 1996 | LTDL 3763-10552 | 1996 | 321 |
| Chaining - Two-Way Unknown | Mud Springs Chaining and Seeding 8 1966 | LTDL 7826-21376 | 1966 | 3822 |
| Seeding - Aerial Before | Mud Springs Chaining and Seeding 8 1966 | LTDL 7826-21375 | 1966 | 3822 |
| Fire - Wildfire | East Carbon | - | July 1996 | 1094 |
| Chaining - Chain Unknown | East Carbon Fire Rehabilitation 1996 | LTDL 3763-10553 | 1996 | 321 |
| Seeding - Dribbler Unknown | East Carbon Fire Rehabilitation 1996 | LTDL 3763-10554 | 1996 | 321 |

**Table 11B-05.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Mud Springs Seed Mix | | | Aerial | Jan 1966 | 3822 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron cristatum | Crested Wheatgrass | | 7.50 | 0.00 |
| F | Medicago sativa ssp. sativa | Alfalfa | Nomad | 0.90 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 0.90 | 0.00 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| East Carbon Aerial Mix | | | Aerial | Aug 1996 | 300 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Dactylis glomerata | Orchardgrass | Paiute | 0.83 | 0.00 |
| G | Psathyrostachys juncea | Russian Wildrye | Swift | 2.00 | 0.00 |
| G | Thinopyrum intermedium | Intermediate Wheatgrass | | 2.00 | 0.00 |
| G | Thinopyrum ponticum | Tall Wheatgrass | | 2.00 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 0.50 | 0.00 |
| F | Sanguisorba minor | Small Burnet | Delar | 0.50 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 1.00 | 0.00 |
| S | Purshia tridentata | Antelope Bitterbrush | | 0.50 | 0.00 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| East Carbon Dribbler Mix | | | Ground | Aug 1996 | 300 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| S | Atriplex canescens | Fourwing Saltbush | | 1.00 | 0.00 |
| S | Purshia | Bitterbrush | | 0.00 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 11B-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | year-long |
| Pronghorn | crucial | year-long |

**Table 11B-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Perennial Grass/Black Sagebrush | Phase I transitioning to Phase II |
| 1994 | Perennial Grass/Black Sagebrush | Phase I transitioning to Phase II |
| 2000 | Perennial Grass | No Encroachment |
| 2005 | Perennial Grass | No Encroachment |
| 2010 | Perennial Grass | No Encroachment |
| 2015 | Perennial Grass | No Encroachment |
| 2020 | Perennial Grass | Early Phase I |
| 2025 | Perennial Grass | No Encroachment |

## Site Notes

In 1966, the area was two-way chained to remove twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), and was seeded with crested wheatgrass (*Agropyron cristatum*), fourwing saltbush (*Atriplex canescens*) and alfalfa (*Medicago sativa*). After 20 years, the site was again tree-dominated due to young individuals that were left after the original chaining. In 1996, the area was part of the East Carbon wildfire that burned 1,094 acres. After the fire, the site was chained and apparently seeded with a dribbler. The wildfire eliminated all of the trees and nearly all of the shrubs.

## Soils

**Table 11B-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.3 | 51.0 | 26.4 | 22.6 | 2.2 | 5.2 | 124.8 | 0.7 | 05/18/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Upland Shallow Loam (Birchleaf Mountain Mahogany) |
| NRCS Ecological Site # | R034BY321UT |
| States and Transitions | No state and transition model is available for this ecological site. |

When the study was established in 1986, the plant community on this site was dominated by black sagebrush (*Artemisia nova*) (Photos, Pre-1992 Data). Following the East Carbon wildfire in 1996 and subsequent chaining and seeding (Table 11B-05.1), cover of all browse species exhibited a substantial decrease (Table 11B-05.6, Table 11B-05.12). Perennial grasses have been the dominant vegetation component since the 2000 sample year with the seeded species crested wheatgrass (*Agropyron cristatum*) contributing most of the cover (Table 11B-05.2, Table 11B-05.7, Table 11B-05.10). Forb diversity and abundance have remained limited over the duration of the study (Table 11B-05.11). Although diversity and cover of browse have increased slightly following the burn and related treatments (Table 11B-05.12), it is likely that the shrub community will recover slowly due to the competitive nature of crested wheatgrass.

Mule deer winter range conditions have varied between very poor and poor-fair since 1994. Winter habitat condition was considered very poor-poor in 2025, and was limited by a lack of preferred browse cover and recruitment, and very low perennial forb cover (Table 11B-05.6, Table 11B-05.7, Table 11B-05.13, Table 11B-05.15). Mule deer presence has been low in most sample years, but it was high in 2020 and moderate in 2025. Elk presence remained low or absent since 2000. However, cattle have had variable presence ranging from high in 2005 and 2020, to low in 2000, 2015, and 2025 (Table 11B-05.9). Utilization of Mormon tea (*Ephedra viridis*) has remained heavy in most sample years, but this browse species was lightly hedged in 2015 and 2025. Due to the small population size and palatability, Mormon tea has received a disproportionate amount of utilization (Table 11B-05.13). On-site observations noted little to no use on the herbaceous community in 2025.

## Trend Summary Tables

**Table 11B-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 11.0 | 0.2 | 4.6 | - | - | - |
| 2000 | 0.3 | - | - | - | - | - |
| 2005 | 0.3 | - | - | 0.7 | - | - |
| 2010 | 1.0 | 0.0 | - | 0.8 | - | - |
| 2015 | 1.2 | 0.1 | - | 0.5 | 0.1 | - |
| 2020 | 2.9 | 1.7 | - | 2.3 | 0.8 | - |
| 2025 | 2.5 | 2.2 | - | 2.1 | 1.5 | - |

**Table 11B-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 311 | - | 60 | - | 10.3 | - | 0.8 |
| 2000 | - | 327 | 14 | 69 | - | 20.9 | 0.1 | 0.9 |
| 2005 | - | 341 | 20 | 46 | - | 17.0 | 0.1 | 0.4 |
| 2010 | - | 361 | 1 | 59 | - | 28.3 | 0.0 | 0.9 |
| 2015 | - | 376 | 19 | 75 | - | 28.4 | 0.1 | 0.6 |
| 2020 | - | 364 | 20 | 86 | - | 28.8 | 0.1 | 1.4 |
| 2025 | 2 | 368 | 3 | 63 | 0.0 | 30.6 | 0.1 | 0.4 |

**Table 11B-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 15.6 | 2.8 | 45.2 | 1.5 | 10.5 | 28.3 |
| 2000 | 38.0 | 0.6 | 30.5 | 6.8 | 13.5 | 24.0 |
| 2005 | 55.0 | 0.0 | 17.1 | 2.1 | 13.4 | 17.8 |
| 2010 | 24.4 | 0.1 | 29.3 | 8.8 | 15.0 | 32.3 |
| 2015 | 31.6 | 0.9 | 28.9 | 7.8 | 14.8 | 31.9 |
| 2020 | 38.7 | 2.5 | 25.2 | 6.9 | 18.9 | 33.6 |
| 2025 | 29.4 | 3.3 | 32.2 | 7.8 | 17.7 | 34.9 |

**Table 11B-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1994 | - | 35 | 1 | 20 |
| 2000 | 1 | 20 | - | 66 |
| 2005 | 12 | 11 | 10 | 27 |
| 2010 | 6 | 4 | 2 | 16 |
| 2015 | 2 | 4 | - | 38 |
| 2020 | 9 | 22 | 1 | 48 |
| 2025 | 2 | 33 | 3 | 36 |
| Year | Days Use Per Acre (ha) | | | |
| 1994 | - | - | - | - |
| 2000 | 4.4 (10.8) | 9.4 (23.2) | - | - |
| 2005 | 42.1 (104.0) | 6.0 (14.9) | 6.7 (16.6) | - |
| 2010 | 13.1 (32.3) | 5.3 (13.2) | 1.3 (3.3) | - |
| 2015 | 8.7 (21.5) | 8.7 (21.5) | 1.3 (3.3) | - |
| 2020 | 21.1 (52.0) | 47.6 (117.5) | - | - |
| 2025 | 3.6 (9.0) | 28.1 (69.5) | 6.0 (14.9) | - |

**Table 11B-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus inermis[i] (smooth brome) | Dactylis glomerata[i] (orchardgrass) | Festuca idahoensis (Idaho fescue) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1994 | 4 | 298 | - | 6 | - | - | 13 | 8 | - | - | 7 | - | - |
| 2000 | 9 | 312 | - | 5 | 10 | 16 | 3 | - | - | - | - | 47 | - |
| 2005 | 22 | 337 | - | 21 | - | 1 | 1 | - | - | - | - | 1 | - |
| 2010 | 1 | 355 | - | 3 | - | 1 | - | - | - | 32 | - | 10 | - |
| 2015 | 8 | 356 | - | 17 | - | - | 4 | - | 1 | 43 | - | 10 | - |
| 2020 | 10 | 360 | - | 1 | - | - | 5 | 5 | - | 27 | - | 17 | - |
| 2025 | 9 | 288 | 2 | 2 | - | - | 6 | - | 4 | 97 | - | 3 | 2 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1994 | 0.1 | 9.4 | - | 0.2 | - | - | 0.1 | 0.2 | - | - | 0.3 | - | - |
| 2000 | 1.0 | 17.7 | - | 0.4 | 0.0 | 0.1 | 0.0 | - | - | - | - | 1.7 | - |
| 2005 | 0.2 | 16.3 | - | 0.5 | - | 0.0 | 0.0 | - | - | - | - | 0.0 | - |
| 2010 | 0.0 | 26.3 | - | 0.4 | - | 0.1 | - | - | - | 1.2 | - | 0.3 | - |
| 2015 | 0.1 | 26.7 | - | 0.2 | - | - | 0.0 | - | 0.0 | 1.4 | - | 0.1 | - |
| 2020 | 0.2 | 26.0 | - | 0.0 | - | - | 0.4 | 0.1 | - | 1.4 | - | 0.7 | - |
| 2025 | 0.4 | 20.9 | 0.0 | 0.0 | - | - | 0.2 | - | 0.1 | 8.9 | - | 0.1 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Arabis selbyi (Selby's rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (looseflower milkvetch) | Astragalus wingatanus (Fort Wingate milkvetch) | Calochortus nuttallii (sego lily) | Caulanthus crassicaulis[a] (thickstem wild cabbage) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chamaesyce fendleri (Fendler's sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cirsium undulatum[a] (wavyleaf thistle) | Cryptantha humilis (roundspike cryptantha) | Descurainia pinnata[a] (western tansymustard) | Gilia inconspicua[a] (shy gilia) | Grindelia squarrosa (curlycup gumweed) | Hedysarum boreale (Utah sweetvetch) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 12 | 16 | - | 18 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | 22 | - | 0 | - | - | - | - | 6 | - | - | - | - | - | 3 | - | - |
| 2005 | - | 34 | - | 2 | - | - | - | - | 5 | - | - | 3 | 1 | - | 3 | - | - |
| 2010 | - | 14 | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 2015 | - | 26 | 3 | - | 4 | 3 | - | - | - | 9 | - | 4 | - | - | 1 | - | - |
| 2020 | 9 | 23 | 3 | - | 3 | 2 | 3 | 5 | - | 8 | - | - | - | 2 | 5 | 2 | 5 |
| 2025 | - | 25 | 7 | - | - | - | - | 3 | - | 3 | 0 | - | - | 2 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.0 | 0.2 | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | 0.6 | - | 0.1 | - | - | - | - | 0.0 | - | - | - | - | - | 0.1 | - | - |
| 2005 | - | 0.1 | - | 0.1 | - | - | - | - | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | - | - |
| 2010 | - | 0.4 | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 |
| 2015 | - | 0.3 | 0.2 | - | 0.0 | 0.0 | - | - | - | 0.1 | - | 0.0 | - | - | 0.0 | - | - |
| 2020 | 0.0 | 0.6 | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | - | - | - | 0.0 | 0.1 | 0.0 | 0.0 |
| 2025 | - | 0.2 | 0.0 | - | - | - | - | 0.0 | - | 0.1 | 0.0 | - | - | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Penstemon cyanocaulis (bluestem beardtongue) | Penstemon pachyphyllus (thickleaf beardtongue) | Physaria ludoviciana (foothill bladderpod) | Salsola tragus[ai] (prickly Russian thistle) | Sanguisorba minor[i] (small burnet) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1994 | - | - | 1 | - | 5 | - | 7 | - | - | 3 | - | - | - |
| 2000 | 8 | - | - | 5 | 5 | - | 6 | 13 | 1 | 17 | 6 | - | - |
| 2005 | - | - | - | - | - | - | - | 15 | - | 1 | 6 | 1 | 2 |
| 2010 | - | - | - | - | - | - | - | - | - | 34 | 6 | - | 3 |
| 2015 | - | - | - | - | - | 1 | 4 | 3 | - | 28 | 10 | 3 | 1 |
| 2020 | - | - | 15 | - | - | 5 | 8 | - | - | 15 | 11 | 1 | - |
| 2025 | - | 6 | 6 | - | 1 | 8 | 1 | - | - | 4 | 9 | 1 | - |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1994 | - | - | 0.0 | - | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - |
| 2000 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | - |
| 2005 | - | - | - | - | - | - | - | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 |
| 2010 | - | - | - | - | - | - | - | - | - | 0.3 | 0.0 | - | 0.0 |
| 2015 | - | - | - | - | - | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | 0.0 |
| 2020 | - | - | 0.2 | - | - | 0.1 | 0.0 | - | - | 0.1 | 0.1 | 0.0 | - |
| 2025 | - | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Ephedra viridis[p] (mormon tea) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. speciosa[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | - | 0.1 | - | 0.6 | - | - | - | - | - | - |
| 2010 | - | - | - | 0.2 | 0.6 | - | - | - | - | - | - |
| 2015 | - | - | 0 | 0.1 | 0.4 | - | - | 0.1 | - | - | 0 |
| 2020 | - | - | 1.2 | - | 1.1 | - | - | 0.8 | - | - | 0 |
| 2025 | - | - | 0.1 | 0 | 1.2 | - | 0.3 | 1.5 | - | - | 0.5 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1994 | 8.8 | 0.8 | - | 1.0 | 0.4 | - | - | 0.2 | 3.0 | 1.6 | - |
| 2000 | - | - | - | 0.0 | 0.1 | - | - | - | - | - | 0.1 |
| 2005 | - | - | 0.0 | 0.0 | 0.1 | - | - | - | - | - | 0.1 |
| 2010 | - | - | - | 0.1 | 0.7 | - | - | 0.0 | - | - | 0.1 |
| 2015 | - | - | 0.2 | 0.4 | 0.5 | - | - | 0.1 | - | - | 0.1 |
| 2020 | - | - | 0.8 | - | 1.2 | - | 0.0 | 1.7 | - | - | 0.9 |
| 2025 | - | - | 0.0 | 0.4 | 1.2 | 0.1 | 0.1 | 2.2 | - | - | 0.8 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 109/233 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 9/23 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1994 | 6080 | 100 | 9 | 77 | 14 | 31 | 1 | 3 | 37/52 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | 180 | - | 11 | 78 | 11 | 44 | 0 | 0 | 41/72 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 25/37 |
| 2010 | - | - | - | - | - | - | - | - | 28/40 |
| 2015 | - | - | - | - | - | - | - | - | 40/58 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 50 | 0 | - / - |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 48/53 |
| 2010 | 20 | - | 100 | 0 | 0 | 100 | 0 | 0 | 52/67 |
| 2015 | 60 | - | 0 | 67 | 33 | 0 | 100 | 100 | 55/82 |
| 2020 | 40 | - | 0 | 50 | 50 | 0 | 50 | 50 | 82/121 |
| 2025 | 20 | - | 0 | 0 | 100 | 100 | 0 | 100 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1994 | 60 | - | 0 | 100 | 0 | 33 | 0 | 0 | 101/117 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 31/25 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 36/29 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | 50/53 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 58/60 |
| 2020 | - | - | - | - | - | - | - | - | 79/91 |
| 2025 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1994 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 66/61 |
| 2000 | 200 | - | 10 | 90 | 0 | 10 | 90 | 0 | 28/31 |
| 2005 | 160 | - | 0 | 100 | 0 | 0 | 100 | 0 | 32/61 |
| 2010 | 160 | - | 50 | 50 | 0 | 50 | 50 | 0 | 53/83 |
| 2015 | 280 | - | 7 | 93 | 0 | 0 | 0 | 93 | 51/94 |
| 2020 | 400 | - | 5 | 95 | 0 | 5 | 70 | 0 | 70/101 |
| 2025 | 460 | - | 0 | 96 | 4 | 0 | 0 | 22 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 34/58 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 66/107 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa ssp. nauseosa var. speciosa[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 64/76 |
| 2020 | 120 | - | 33 | 67 | 0 | 17 | 0 | 0 | 38/50 |
| 2025 | 80 | - | 75 | 25 | 0 | 75 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 300 | - | 20 | 80 | 0 | 0 | 0 | 0 | 21/18 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/20 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/16 |
| 2015 | 720 | 180 | 47 | 53 | 0 | 8 | 3 | 6 | 10/16 |
| 2020 | 12120 | 5280 | 68 | 32 | 1 | 0 | 0 | 1 | 13/19 |
| 2025 | 21580 | 20 | 53 | 46 | 2 | 0 | 0 | 1 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1994 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/33 |
| 2000 | - | - | - | - | - | - | - | - | 14/41 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/27 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/33 |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 10/37 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/24 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 34/60 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 22/39 |
| 2010 | - | - | - | - | - | - | - | - | 54/87 |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 63/110 |
| 2020 | 20 | 40 | 0 | 100 | 0 | 0 | 100 | 0 | 80/139 |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 9/6 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

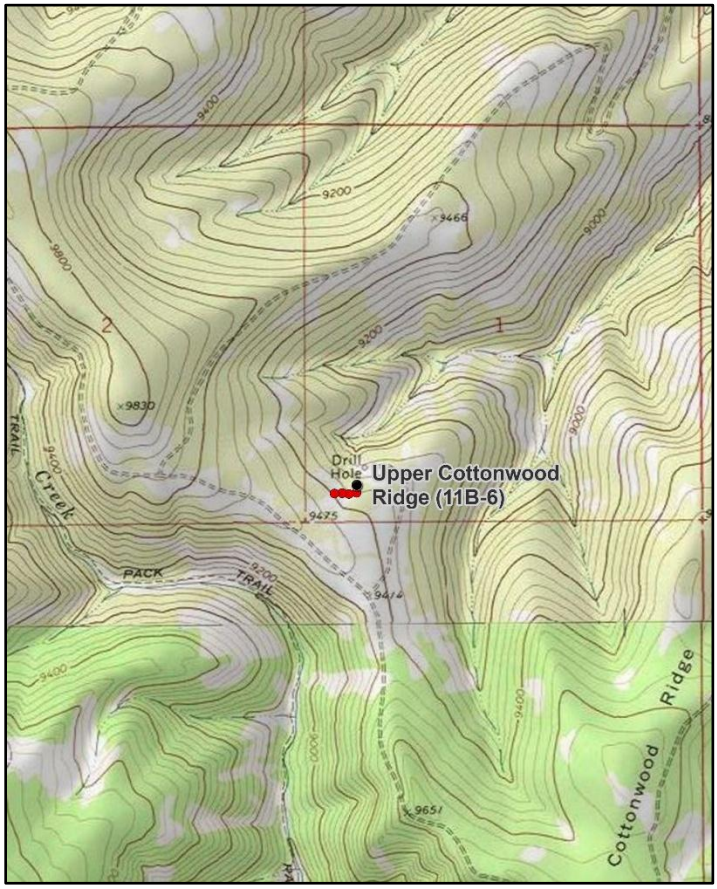
**Table 11B-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

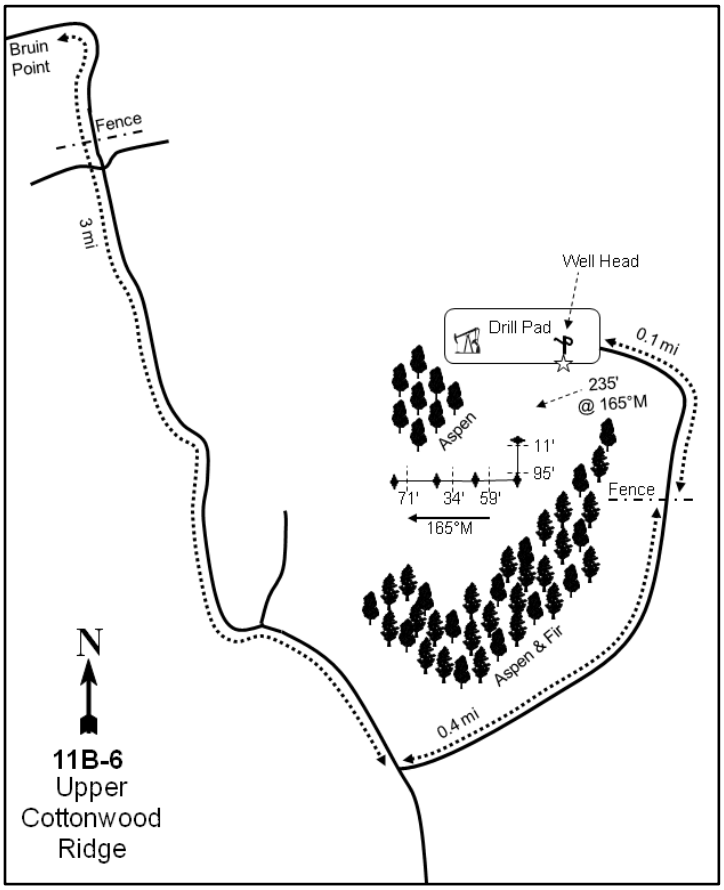
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1994 | 231 | - | - | - | - | - | 5.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1994 | 146 | - | - | - | - | - | 6.1 |
| 2020 | 2 | 100 | - | - | - | - | 1.0 |

**Table 11B-05.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 14.0 | 11.5 | 3.8 | 20.7 | 0.0 | 1.5 | 0.0 | **51.5** | Poor-Fair |
| 2000 | 0.5 | 0.0 | 0.0 | 30.0 | 0.0 | 1.9 | 0.0 | **32.4** | Very Poor |
| 2005 | 0.9 | 0.0 | 0.0 | 30.0 | 0.0 | 0.8 | 0.0 | **31.7** | Very Poor |
| 2010 | 1.1 | 0.0 | 0.0 | 30.0 | 0.0 | 1.7 | 0.0 | **32.8** | Very Poor |
| 2015 | 0.7 | 0.0 | 0.0 | 30.0 | 0.0 | 1.3 | 0.0 | **32.0** | Very Poor |
| 2020 | 2.9 | 0.0 | 0.0 | 30.0 | 0.0 | 2.8 | 0.0 | **35.7** | Very Poor-Poor |
| 2025 | 2.8 | 0.0 | 0.0 | 30.0 | 0.0 | 0.8 | 0.0 | **33.6** | Very Poor-Poor |

# UPPER COTTONWOOD RIDGE - STUDY NO. 11B-6




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Bruin Point SE; Township 14S, Range 14E, Section 01 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 559655 East 4386924 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 7835 |
| Transect Bearing | 165° magnetic (Lines 2-4: 258° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (59ft), Line 3 (34ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From Sunnyside, proceed up Water Canyon to the summit at Bruin Point (approximately 5.6 miles). Take the middle fork and go 0.4 miles to a cattle guard. Stay right just beyond the cattle guard and proceed 0.9 miles to an intersection and a large pipe gateway. Go straight through the gateway and proceed 1.8 miles to a fork. Turn left and travel 0.4 miles to a fence. Walk 0.1 miles to the end of the road, which is an oil drilling pad. The baseline is located 235 feet south at a bearing of 201 degrees magnetic from the well head. The 0-foot end of the frequency baseline is marked by a 4-foot tall fence post tagged #7835.

| Site Information | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | GREEN RIVER |
| Elevation | 9,300ft (2,835m) |
| Aspect | North |
| Slope | 18% |
| Sample Dates | 09/08/1994, 08/10/2000, 08/23/2010, 07/22/2015, 06/29/2020, 06/30/2025 |

## Wildlife Habitat and Vegetation History

**Table 11B-06.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |

**Table 11B-06.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Perennial Grass/Quaking Aspen-Conifer Encroached | NA |
| 1994 | Perennial Grass-Forb/Quaking Aspen-Conifer Encroached | NA |
| 2000 | Perennial Grass-Forb/Quaking Aspen-Conifer Encroached | NA |
| 2010 | Perennial Grass-Forb/Quaking Aspen-Conifer Encroached | NA |
| 2015 | Perennial Grass-Forb/Quaking Aspen-Conifer Encroached | NA |
| 2020 | Quaking Aspen-Conifer Encroached/Perennial Grass-Forb | NA |
| 2025 | Quaking Aspen-Conifer Encroached/Perennial Grass-Forb | NA |

## Site Notes

The study is located in an open meadow surrounded by quaking aspen (*Populus tremuloides*), subalpine fir (*Abies lasiocarpa*) and Douglas fir (*Pseudotsuga menziesii*). The meadow is near the ridge top at the headwaters of Cottonwood Creek. The high, cool, north-facing slope supports an abundant variety of plant life. The lack of a permanent water source nearby likely limits the use of the area by big game during the summer.

## Soils

**Table 11B-06.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 6.7 | 28.0 | 37.4 | 34.6 | 5.5 | 17.3 | 246.4 | 0.8 | 08/10/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 23 inches |
| NRCS Ecological Site | High Mountain Loam (Aspen) |
| NRCS Ecological Site # | R048AY506UT |
| States and Transitions | No state and transition model is available for this ecological site. |

Upon study establishment in 1986, this site was dominated by perennial grasses and surrounded by subalpine fir (*Abies lasiocarpa*) and quaking aspen (*Populus tremuloides*) (Photos, Pre-1992 Data). Subalpine fir has encroached on the site over the study period, but aspen cover has remained similar over time. Cover of aspen decreased between 2010 and 2015, but it has since recovered (Table 11B-06.12). The herbaceous understory has remained abundant and diverse throughout the duration of the study (Table 11B-06.7). The cover of the introduced perennial grass species Kentucky bluegrass (*Poa pratensis*) decreased substantially in 2020 and remained low in 2025, but it has been the main perennial grass component in all other sample years (Table 11B-06.10). Perennial forbs have contributed a majority of the herbaceous cover since 2015 (Table 11B-06.11).

The preferred shrub and herbaceous communities on this site may provide adequate forage for deer and elk (Beck & Peek, 2005) during the summer months (Table 11B-06.3, Table 11B-06.6, Table 11B-06.7). However, pellet transect data indicates that presence of both deer and elk have been low since 2010; elk presence was moderate in 2000. During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Utilization of mountain big sagebrush has increased over time and has mostly been considered to be moderate. It appears that utilization pressure may have resumed as the sagebrush population has increased in density (Photos, Table 11B-06.9, Table 11B-06.13). On-site observations for 2025 noted little to no utilization on the herbaceous community.

## Trend Summary Tables

**Table 11B-06.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 1.1 | - | 4.4 | - | - | - |
| 2000 | 3.2 | - | 6.6 | - | - | - |
| 2010 | 6.6 | - | 9.9 | 10.2 | - | 33.6 |
| 2015 | 9.2 | - | 11.8 | 13.8 | - | 28.2 |
| 2020 | 11.2 | - | 10.9 | 16.9 | - | 37.4 |
| 2025 | 12.6 | - | 14.1 | 20.6 | - | 40.9 |

**Table 11B-06.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 414 | 107 | 364 | - | 13.2 | 0.4 | 11.8 |
| 2000 | - | 377 | 75 | 362 | - | 11.6 | 0.7 | 16.4 |
| 2010 | - | 357 | 65 | 338 | - | 26.0 | 0.9 | 23.2 |
| 2015 | - | 369 | 95 | 385 | - | 17.9 | 0.9 | 23.8 |
| 2020 | - | 288 | 91 | 355 | - | 9.7 | 1.2 | 26.7 |
| 2025 | - | 289 | 55 | 374 | - | 12.2 | 0.4 | 24.4 |

**Table 11B-06.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 11.3 | 1.0 | 38.7 | 0.2 | 0.6 | 35.8 |
| 2000 | 17.6 | 0.7 | 62.4 | 0.3 | 0.1 | 44.6 |
| 2010 | 15.3 | 0.0 | 51.5 | 1.0 | 1.0 | 58.5 |
| 2015 | 23.6 | 0.2 | 46.1 | 0.2 | 0.1 | 52.9 |
| 2020 | 14.4 | 0.1 | 58.1 | 1.6 | 0.2 | 56.8 |
| 2025 | 14.9 | 0.1 | 51.2 | 0.3 | 0.1 | 57.7 |

**Table 11B-06.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Black Bear | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Rabbit | Domestic Sheep |
|---|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | | |
| 1994 | - | 2 | 2 | 17 | - | - | 4 | - |
| 2000 | - | - | - | 12 | - | - | - | - |
| 2010 | - | 3 | 3 | 1 | - | - | - | 1 |
| 2015 | - | - | - | 1 | - | - | - | - |
| 2020 | - | - | 6 | 4 | - | 1 | - | - |
| 2025 | - | - | 2 | - | - | - | - | - |
| Year | Days Use Per Acre (ha) | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - |
| 2000 | - | - | 8.1 (19.9) | 25.5 (62.9) | - | - | - | - |
| 2010 | - | 3.6 (9.0) | - | 2.7 (6.6) | 8.7 (21.5)* | - | - | - |
| 2015 | - | 3.6 (9.0) | 1.3 (3.3) | 0.7 (1.7) | - | - | - | - |
| 2020 | 8.7 (21.5)* | - | 9.4 (23.2) | 8.1 (19.9) | - | 2.3 (5.7) | - | - |
| 2025 | - | 1.5 (3.6) | 12.8 (31.5) | 5.3 (13.2) | - | 1.7 (4.3) | - | - |

*Pellets per acre (ha)

**Table 11B-06.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus marginatus (mountain brome) | Bromus porteri (Porter brome) | Carex (sedge) | Carex rossii (Ross' sedge) | Elymus glaucus ssp. glaucus (blue wildrye) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Trisetum spicatum (spike trisetum) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1994 | 57 | 25 | 6 | - | 42 | - | 81 | - | 356 | - | 15 |
| 2000 | 24 | 69 | 30 | - | 28 | - | 73 | 3 | 289 | - | - |
| 2010 | 68 | 57 | 8 | - | 34 | - | 8 | 29 | 284 | 12 | 12 |
| 2015 | 69 | 84 | 28 | 8 | 57 | - | 23 | 3 | 251 | - | 24 |
| 2020 | 87 | 153 | 26 | 6 | 32 | - | 17 | 8 | 77 | - | 5 |
| 2025 | 60 | 131 | 6 | 8 | 45 | 46 | 66 | 19 | 117 | - | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1994 | 0.3 | 0.3 | 0.1 | - | 0.1 | - | 0.6 | - | 11.5 | - | 0.2 |
| 2000 | 0.2 | 1.7 | 0.4 | - | 0.3 | - | 1.1 | 0.0 | 7.8 | - | - |
| 2010 | 2.3 | 2.2 | 0.3 | - | 0.7 | - | 0.3 | 0.8 | 19.2 | 0.2 | 0.1 |
| 2015 | 1.8 | 1.5 | 0.6 | 0.2 | 0.7 | - | 0.2 | 0.1 | 12.7 | - | 0.1 |
| 2020 | 2.7 | 4.1 | 0.2 | 0.2 | 0.6 | - | 0.1 | 0.3 | 1.4 | - | 0.1 |
| 2025 | 1.7 | 3.1 | 0.4 | 0.1 | 1.4 | 1.2 | 1.7 | 0.1 | 2.5 | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-06.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris aurantiaca (orange agoseris) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Arabis drummondii (Drummond's rockcress) | Arnica mollis (hairy arnica) | Astragalus miser (timber milkvetch) | Calochortus gunnisonii (Gunnison's mariposa lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cirsium calcareum[a] (Cainville thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Comandra umbellata (bastard toadflax) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 156 | 7 | - | 42 | 17 | - | 5 | - | - | 10 | - | 26 | - | - | - | - | - |
| 2000 | 101 | 63 | 40 | 44 | 10 | - | 40 | - | - | - | 2 | 9 | 7 | - | 17 | 34 | - |
| 2010 | 145 | 44 | 1 | 43 | - | - | - | 2 | - | 4 | - | 25 | 7 | - | 5 | - | - |
| 2015 | 195 | 79 | 66 | 76 | 11 | - | 18 | - | - | 10 | - | 13 | - | 1 | - | - | 12 |
| 2020 | 128 | 49 | 13 | 66 | 12 | - | 19 | 29 | 8 | 4 | - | 16 | 1 | - | - | 2 | 51 |
| 2025 | 134 | 17 | 31 | 74 | 10 | 5 | 28 | 6 | - | 18 | - | 15 | - | - | - | - | 42 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 1.5 | 0.0 | - | 0.5 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.3 | - | - | - | - | - |
| 2000 | 0.8 | 0.4 | 0.3 | 1.3 | 0.1 | - | 0.4 | - | - | - | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.2 | - |
| 2010 | 4.0 | 1.2 | 0.0 | 2.0 | - | - | - | 0.1 | - | 0.0 | - | 0.6 | 0.1 | - | 0.0 | - | - |
| 2015 | 3.0 | 0.8 | 0.4 | 2.6 | 0.0 | - | 0.1 | - | - | 0.0 | - | 0.3 | - | 0.0 | - | - | 0.2 |
| 2020 | 1.6 | 0.3 | 0.7 | 2.3 | 0.0 | - | 0.9 | 0.1 | 0.0 | 0.0 | - | 0.3 | 0.0 | - | - | 0.0 | 1.5 |
| 2025 | 2.1 | 0.1 | 0.1 | 2.1 | 0.0 | 0.1 | 0.5 | 0.0 | - | 0.1 | - | 0.2 | - | - | - | - | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erigeron flagellaris (trailing fleabane) | Erigeron speciosus (aspen fleabane) | Eriogonum umbellatum (sulphur-flower buckwheat) | Fragaria vesca (woodland strawberry) | Frasera speciosa (elkweed) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gentiana prostrata (pygmy gentian) | Heliomeris multiflora (showy goldeneye) | Ligusticum (licorice-root) | Lupinus argenteus (silvery lupine) | Osmorhiza occidentalis (western sweetroot) | Penstemon strictus (Rocky Mountain penstemon) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Potentilla hippiana (woolly cinquefoil) | Ranunculus alismifolius (plantainleaf buttercup) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | 12 | - | 42 | - | - | - | - | - | 1 | 5 | - | 10 | 83 | 3 | - | 14 |
| 2000 | - | 20 | - | 22 | - | 4 | 37 | - | - | 10 | 3 | - | - | 6 | - | - | 12 |
| 2010 | - | 35 | - | 47 | - | 7 | 30 | - | - | 29 | 5 | - | 21 | 37 | 4 | - | - |
| 2015 | 5 | 27 | - | 68 | 1 | - | 3 | - | 1 | 53 | 11 | - | 3 | 35 | 4 | - | 4 |
| 2020 | 2 | 55 | 6 | 35 | 1 | - | - | - | 9 | 88 | - | - | 33 | 72 | 1 | 3 | 5 |
| 2025 | 25 | 30 | 3 | 42 | 8 | - | - | 21 | - | 78 | 11 | 4 | 45 | 18 | - | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | 0.1 | - | 0.7 | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.0 | - | 0.0 |
| 2000 | - | 0.2 | - | 0.4 | - | 0.0 | 0.6 | - | - | 0.4 | 0.0 | - | - | 0.0 | - | - | 0.4 |
| 2010 | - | 0.7 | - | 1.0 | - | 0.0 | 0.3 | - | - | 1.5 | 0.0 | - | 0.2 | 0.2 | 0.2 | - | - |
| 2015 | 0.0 | 0.2 | - | 1.0 | 0.1 | - | 0.0 | - | 0.0 | 4.5 | 0.1 | - | 0.0 | 0.1 | 0.0 | - | 0.0 |
| 2020 | 0.0 | 2.2 | 0.0 | 0.4 | 0.0 | - | - | - | 0.1 | 2.6 | - | - | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 |
| 2025 | 1.2 | 0.9 | 0.1 | 0.5 | 0.1 | - | - | 1.0 | - | 4.2 | 0.1 | 0.0 | 0.3 | 0.1 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sedum lanceolatum (spearleaf stonecrop) | Silene menziesii (Menzies' campion) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Thalictrum fendleri (Fendler's meadow-rue) | Vicia americana (American vetch) | Viola adunca (hookedspur violet) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1994 | - | 37 | 46 | 301 | 4 | 6 | 56 |
| 2000 | - | 2 | 100 | 298 | 7 | - | 60 |
| 2010 | 3 | - | 115 | 203 | 1 | - | 45 |
| 2015 | - | 47 | 156 | 263 | 1 | - | 64 |
| 2020 | - | 31 | 142 | 259 | 4 | - | 37 |
| 2025 | - | 34 | 147 | 230 | - | - | 45 |
| year | Average Cover (%) | | | | | | |
| 1994 | - | 0.1 | 0.4 | 7.5 | 0.0 | 0.4 | 0.3 |
| 2000 | - | 0.0 | 1.3 | 9.0 | 0.0 | - | 0.9 |
| 2010 | 0.0 | - | 4.2 | 7.1 | 0.0 | - | 0.5 |
| 2015 | - | 0.2 | 3.9 | 6.3 | 0.0 | - | 0.7 |
| 2020 | - | 0.2 | 4.2 | 9.3 | 0.0 | - | 0.4 |
| 2025 | - | 0.2 | 4.9 | 5.1 | - | - | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-06.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Abies lasiocarpa[t] (subalpine fir) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Picea pungens[t] (blue spruce) | Populus tremuloides[tp] (quaking aspen) | Pseudotsuga menziesii[t] (Douglas-fir) | Ribes montigenum[p] (gooseberry currant) | Rosa woodsii[p] (Woods' rose) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - |
| 2010 | 16 | 1.4 | 0.3 | 17.3 | - | 6.9 | - | 1.9 |
| 2015 | 15.7 | 1.8 | 0.9 | 10.8 | 0.8 | 8.8 | - | 3.2 |
| 2020 | 20.9 | 3.2 | 0.2 | 16.3 | - | 8.8 | - | 4.9 |
| 2025 | 15.3 | 8.3 | 4.8 | 20.8 | - | 7.9 | 0.2 | 4.2 |
| year | Quadrat Cover (%) | | | | | | | |
| 1994 | 2.1 | 0.0 | - | 2.3 | - | 0.8 | - | 0.2 |
| 2000 | 5.0 | 1.1 | - | 1.1 | 0.5 | 1.8 | - | 0.2 |
| 2010 | 6.9 | 0.8 | 0.6 | 2.4 | - | 4.8 | 0.1 | 0.9 |
| 2015 | 7.3 | 2.4 | 1.2 | 3.0 | 0.3 | 6.4 | - | 0.5 |
| 2020 | 8.9 | 3.0 | 0.0 | 2.0 | - | 6.8 | 0.1 | 1.3 |
| 2025 | 10.0 | 6.5 | 0.2 | 3.9 | - | 4.8 | 0.2 | 1.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-06.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Abies lasiocarpa[t] -- (subalpine fir) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 380 | 60 | 74 | 26 | 0 | 0 | 0 | 5 | - / - |
| 2010 | 320 | 260 | 63 | 38 | 0 | 6 | 0 | 6 | - / - |
| 2015 | 320 | 140 | 56 | 44 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 340 | 20 | 59 | 41 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 620 | 60 | 68 | 32 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 57/50 |
| 2000 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | 52/82 |
| 2010 | 980 | 300 | 76 | 25 | 0 | 20 | 0 | 2 | 58/79 |
| 2015 | 1440 | 440 | 54 | 43 | 3 | 39 | 15 | 4 | 51/67 |
| 2020 | 1360 | 7100 | 47 | 49 | 4 | 27 | 0 | 6 | 63/90 |
| 2025 | 1840 | 200 | 32 | 62 | 7 | 47 | 0 | 7 | - / - |
| Cercocarpus ledifolius[p] -- (curl-leaf mountain mahogany) | | | | | | | | | |
| 1994 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus communis -- (common juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | 65/304 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 55/144 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Picea pungens[t] -- (blue spruce) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 100 | - / - |
| 2015 | 40 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Populus tremuloides[tp] -- (quaking aspen) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 1480 | - | 78 | 20 | 1 | 0 | 0 | 0 | - / - |
| 2010 | 1160 | 280 | 88 | 12 | 0 | 16 | 12 | 14 | - / - |
| 2015 | See table 13a - Aspen Characteristics | | | | | | | | |
| 2020 | See table 13a - Aspen Characteristics | | | | | | | | |
| 2025 | See table 13a - Aspen Characteristics | | | | | | | | |
| Pseudotsuga menziesii[t] -- (Douglas-fir) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | 40 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 60 | 80 | 67 | 0 | 33 | 0 | 0 | 33 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ribes montigenum[p] -- (gooseberry currant) | | | | | | | | | |
| 1994 | 460 | 20 | 30 | 70 | 0 | 0 | 0 | 0 | 77/166 |
| 2000 | 760 | - | 8 | 92 | 0 | 0 | 0 | 3 | 51/107 |
| 2010 | 700 | 20 | 17 | 83 | 0 | 0 | 0 | 0 | 72/156 |
| 2015 | 1500 | 420 | 15 | 85 | 0 | 1 | 0 | 1 | 64/114 |
| 2020 | 1560 | - | 8 | 92 | 0 | 0 | 0 | 6 | 51/102 |
| 2025 | 1740 | - | 8 | 92 | 0 | 0 | 0 | 0 | - / - |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 1994 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 33/29 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 49/64 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 40/36 |
| 2020 | 140 | - | 43 | 57 | 0 | 0 | 0 | 0 | 29/42 |
| 2025 | 220 | - | 64 | 36 | 0 | 91 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1994 | 440 | - | 27 | 68 | 5 | 9 | 0 | 5 | 42/58 |
| 2000 | 380 | - | 16 | 74 | 11 | 11 | 0 | 5 | 43/54 |
| 2010 | 420 | 60 | 19 | 81 | 0 | 0 | 0 | 5 | 58/100 |
| 2015 | 460 | 20 | 22 | 78 | 0 | 17 | 0 | 0 | 61/104 |
| 2020 | 880 | 240 | 14 | 86 | 0 | 2 | 0 | 7 | 62/95 |
| 2025 | 680 | - | 15 | 71 | 15 | 44 | 6 | 15 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-06.13a - Aspen Characteristics.** Characteristics of aspen populations including density, size class distribution, and vigor of plants.

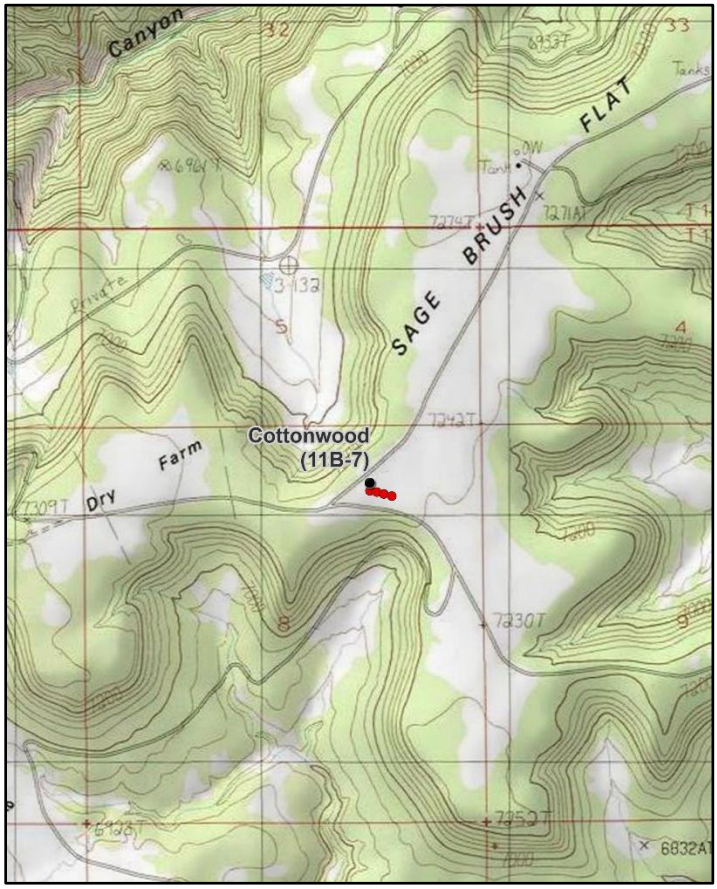
| Year | Density | Size Class Distribution | | | | Utilization | | Poor Vigor (%) |
|---|---|---|---|---|---|---|---|---|
| | Plants per Acre | Class I (%) | Class II (%) | Class III (%) | Class IV (%) | Moderate (%) | Heavy (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | | |
| 2015 | 1620 | 10 | 62 | 20 | 9 | 27 | 11 | 1 |
| 2020 | 1720 | 17 | 42 | 23 | 17 | 9 | 6 | 17 |
| 2025 | 2560 | 16 | 46 | 14 | 24 | 26 | 4 | 39 |

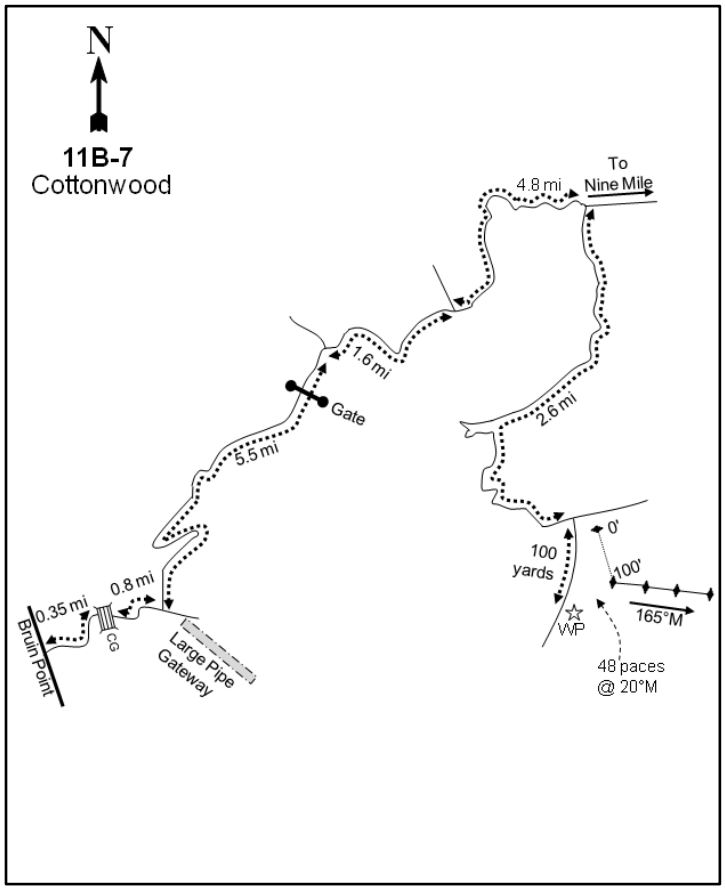
Class I - <= 1.5 feet; Class II - > 1.5 feet to 5 feet; Class III - > 5 feet and up to 1 inch diameter at breast height (dbh); Class IV - > 1 in diameter at breast height (dbh)

**Table 11B-06.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Abies lasiocarpa (subalpine fir) | | | | | | | |
| 2015 | 74 | - | 60 | 13 | - | 27 | 6.4 |
| 2020 | 78 | 7 | 27 | 33 | - | 33 | 7.8 |
| 2025 | 73 | - | 35 | 24 | 18 | 24 | 10.6 |
| Pinus flexilis (limber pine) | | | | | | | |
| 2015 | 6 | - | - | 50 | 50 | - | 6.0 |
| 2020 | 6 | - | - | - | 100 | - | 6.0 |
| Picea pungens (blue spruce) | | | | | | | |
| 2015 | 1 | - | 100 | - | - | - | 3.0 |
| 2020 | 1 | - | - | - | - | 100 | 38.0 |
| 2025 | 1 | 100 | - | - | - | - | 1.0 |
| Populus tremuloides (quaking aspen) | | | | | | | |
| 2015 | 179 | 15 | 55 | 15 | 15 | - | 2.5 |
| 2020 | 202 | 11 | 63 | 16 | 11 | - | 2.0 |
| 2025 | 335 | 5 | 47 | 26 | - | 21 | 3.0 |
| Pseudotsuga menziesii (Douglas-fir) | | | | | | | |
| 2015 | 5 | - | 50 | - | - | 50 | 6.0 |

# COTTONWOOD - STUDY NO. 11B-7




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Twin Hollow NE; Township 13S, Range 16E, Section 08 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 573391 East 4396331 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7872 |
| Transect Bearing | 165° magnetic (Lines 2-4: 93° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (59ft), Line 3 (34ft), Line 4 (71ft) |
| Belt Marker Placement | Belt 5: 5ft |

## Directions to Site

From Range Creek Summit (Bruin Point), take the middle fork and go 0.4 miles. Stay right at the fork just beyond a cattle guard and travel 0.8 miles. Turn left at the intersection just before the large pipe gateway and proceed 0.5 miles to a fork. Stay right and go 4.2 miles to a gate. Go 0.8 miles to a fork and remain right. Proceed 1.6 miles to another fork and remain on the road to the right. Go 4.8 miles to another fork and turn right. Drive 2.6 miles to another fork. While staying to the right, travel another 100 yards to a rebar witness post on left (west) side of the road. The 100-foot baseline stake is 48 paces from the witness post at 20 degrees magnetic. All transect markers are rebar, and the 0-foot end of the baseline is marked by browse tag #7872.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | GREEN RIVER |
| Elevation | 7,200ft (2,195m) |
| Aspect | Southeast |
| Slope | 1% |
| Sample Dates | 09/14/1994, 08/08/2000, 08/09/2005, 08/17/2010, 07/21/2015, 06/30/2020, 06/30/2025 |

**Table 11B-07.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Cottonwood Ridge PJ Removal | 3267 | July 2015-July 2016 | 1019 |
| Hand Crew - Lop-Pile-Burn | Cottonwood Ridge Maintenance | 5404 | May-June 2020 | 372 |
| Seeding - Aerial | Cottonwood Ridge Maintenance | 5404 | January 2021 | 487 |

**Table 11B-07.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Cottonwood Ridge | | | Aerial | Sep 2020 | 450 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Utah | 1.50 | 1.46 |
| G | Elymus elymoides | Bottlebrush Squirreltail | Pueblo | 1.24 | 1.09 |
| G | Pascopyrum smithii | Western Wheatgrass | Arriba | 2.00 | 1.60 |
| G | Poa secunda | Nevada Bluegrass | Opportunity | 0.11 | 0.10 |
| G | Poa secunda | Sandberg Bluegrass | Vale | 0.11 | 0.10 |
| G | Pseudoroegneria spicata | Bluebunch Wheatgrass | Anatone | 1.18 | 1.12 |
| G | Pseudoroegneria spicata | Bluebunch Wheatgrass | Columbia | 0.89 | 0.85 |

## Wildlife Habitat and Vegetation History

**Table 11B-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | substantial | year-long |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 11B-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush | Early Phase I |
| 1994 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2000 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2005 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2010 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2015 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2020 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

The study samples a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) flat at the northeast end of Cottonwood Ridge. The extensive sagebrush opening is surrounded by mature twoneedle pinyon (*Pinus edulis*) woodlands that gradually slope down to steep canyons that drain east into the Green River.

## Soils

**Table 11B-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.4 | 42.0 | 31.4 | 26.6 | 2.3 | 4.6 | 208.0 | 0.8 | 08/08/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Upland Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R048AY306UT |
| States and Transitions | 1986-2005 - Current Potential State: Community Phase 2.3<br>2015-2025 - Sagebrush with Depleted Understory State: Community Phase 6.1 |

Although cover has fluctuated slightly over the study period, the vegetation on this site has remained in a stable state as a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) plant community since study establishment in 1986 (Photos, Pre-1992 Data, Table 11B-07.12, Table 11B-07.13). The herbaceous understory has increased throughout the years and has mainly been comprised of native perennial grasses such as needle and thread (*Hesperostipa comata*) and Indian ricegrass (*Achnatherum hymenoides*), among

others. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been present in some sample years, but with low cover and abundance. Despite the low cover of cheatgrass, its presence signifies a transition in community structure that is less resilient to disturbance (Table 11B-07.7, Table 11B-07.10). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been observed, but trees do not appear to be encroaching upon the community at any significant rate; the site has remained in Early Phase I of woodland succession throughout the study period (Table 11B-07.4, Table 11B-07.12, Table 11B-07.14).

Mule deer winter range conditions have varied between poor and fair-good since 1994. Winter habitat condition was considered to be poor in 2025, and was limited by reduced preferred browse cover and recruitment; a disproportionate amount of high decadence within the preferred browse community; low perennial forb cover; and the presence of cheatgrass (Table 11B-07.6, Table 11B-07.7, Table 11B-07.13, Table 11B-07.15). During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Mule deer presence has been low since 2000. Elk presence has been low in most sample years, but it was considered moderate in 2000 (Table 11B-06.9). Utilization of Wyoming big sagebrush has ranged between light and heavy since 1994, but utilization was at its heaviest in 2015 (Table 11B-07.13). On-site observations noted light utilization (10-20%) on most grasses, but needle and thread (*Hesperostipa comata*) was more than 80% utilized. Light utilization was estimated on flaxleaf plainsmustard (*Schoenocrambe linifolia*). It was also noted that the community may have been affected by drought as indicated by poor primary production, seed production, and leader growth. Hummingbirds were seen on site while song birds were heard throughout.

## Trend Summary Tables

**Table 11B-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 14.2 | 0.6 | 0.0 | - | - | - |
| 2000 | 15.8 | 0.3 | 0.0 | - | - | - |
| 2005 | 12.6 | 0.0 | - | 14.3 | 0.2 | 0.2 |
| 2010 | 10.4 | 0.0 | 0.0 | 15.0 | 0.2 | 0.2 |
| 2015 | 9.8 | 0.1 | 0.0 | 13.7 | 0.3 | 0.4 |
| 2020 | 15.4 | 0.3 | - | 13.2 | 0.2 | - |
| 2025 | 10.6 | 0.1 | - | 11.7 | - | - |

**Table 11B-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 315 | - | 284 | - | 5.7 | - | 6.0 |
| 2000 | - | 373 | - | 246 | - | 16.0 | - | 5.6 |
| 2005 | 6 | 300 | 4 | 237 | 0.0 | 13.8 | 0.0 | 8.7 |
| 2010 | 2 | 349 | 38 | 141 | 0.0 | 17.9 | 0.1 | 1.6 |
| 2015 | - | 406 | 31 | 259 | - | 27.7 | 0.1 | 3.4 |
| 2020 | 4 | 385 | 12 | 159 | 0.1 | 20.7 | 0.0 | 1.6 |
| 2025 | - | 348 | 2 | 121 | - | 12.8 | 0.0 | 1.5 |

**Table 11B-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 43.7 | 2.9 | 16.6 | 1.0 | 2.3 | 25.5 |
| 2000 | 40.5 | 8.1 | 24.6 | 1.8 | 1.2 | 38.3 |
| 2005 | 47.8 | 4.1 | 21.3 | 2.2 | 1.7 | 30.4 |
| 2010 | 35.1 | 11.7 | 26.1 | 2.1 | 1.3 | 34.0 |
| 2015 | 38.7 | 12.2 | 23.6 | 1.8 | 1.7 | 38.0 |
| 2020 | 31.4 | 12.1 | 34.3 | 6.9 | 2.2 | 34.6 |
| 2025 | 46.4 | 5.5 | 32.5 | 1.7 | 1.9 | 22.6 |

**Table 11B-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1994 | - | 10 | 10 | - | - | - | 43 |
| 2000 | - | 1 | 6 | - | - | - | 40 |
| 2005 | 1 | 1 | 24 | 1 | - | - | 47 |
| 2010 | - | 5 | 1 | - | - | - | 4 |
| 2015 | - | 7 | - | - | - | - | 35 |
| 2020 | - | 10 | 2 | - | 1 | - | 19 |
| 2025 | 2 | 4 | - | - | 7 | - | 27 |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1994 | - | - | - | - | - | - | - |
| 2000 | - | 1.3 (3.3) | 23.4 (57.9) | - | - | 1.5 (3.6) | - |
| 2005 | 2.2 (5.4) | 5.3 (13.2) | 15.4 (38.1) | 17.4 (43.0)* | - | - | - |
| 2010 | - | 2.0 (5.0) | 2.0 (5.0) | 8.7 (21.5)* | - | - | - |
| 2015 | - | 5.3 (13.2) | 4.7 (11.6) | - | - | - | - |
| 2020 | 1.5 (3.6) | 3.4 (8.3) | 7.4 (18.2) | 8.7 (21.5)* | 3.5 (8.6) | - | - |
| 2025 | 5.8 (14.3) | - | 2.7 (6.6) | - | 3.5 (8.6) | - | - |

*Pellets per acre (ha)

**Table 11B-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Leymus salinus (saline wildrye) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1994 | 74 | - | 27 | 84 | 8 | 232 | 8 | - |
| 2000 | 129 | - | 34 | 114 | 7 | 274 | 2 | - |
| 2005 | 46 | 6 | 46 | 189 | - | 150 | 31 | 17 |
| 2010 | 40 | 2 | 23 | 264 | 17 | 117 | 9 | 15 |
| 2015 | 41 | - | 94 | 268 | 56 | 140 | 4 | 48 |
| 2020 | 84 | 4 | 26 | 213 | 4 | 220 | 11 | 84 |
| 2025 | 68 | - | 13 | 169 | 190 | 4 | - | 4 |
| year | Average Cover (%) | | | | | | | |
| 1994 | 1.0 | - | 0.3 | 1.6 | 0.2 | 2.6 | 0.0 | - |
| 2000 | 6.8 | - | 0.6 | 3.8 | 0.0 | 4.7 | 0.0 | - |
| 2005 | 1.5 | 0.0 | 1.0 | 7.5 | - | 2.3 | 1.2 | 0.3 |
| 2010 | 2.4 | 0.0 | 0.2 | 13.0 | 0.3 | 1.9 | 0.1 | 0.1 |
| 2015 | 1.5 | - | 3.3 | 15.5 | 3.1 | 3.5 | 0.1 | 0.8 |
| 2020 | 3.6 | 0.1 | 0.5 | 10.0 | 0.4 | 4.4 | 0.6 | 1.1 |
| 2025 | 2.1 | - | 0.2 | 5.2 | 5.2 | 0.0 | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Antemaria (pussytoes) | Arabis (rockcress) | Arabis drummondii (Drummond's rockcress) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Caulanthus crassicaulis[a] (thickstem wild cabbage) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha fulvocanescens (tawny cryptantha) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) | Eriogonum racemosum (redroot buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Orobanche fasciculata (clustered broomrape) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | - | 7 | 1 | - | 1 | - | 1 | - | 75 | - | 1 | 4 | - | 1 | - | - |
| 2000 | - | 11 | - | 4 | - | - | - | - | - | - | - | 5 | - | - | - | - | - |
| 2005 | - | 7 | 6 | - | - | - | - | - | - | 7 | - | - | - | - | - | - | 1 |
| 2010 | - | - | - | - | 8 | 10 | - | 1 | 37 | 28 | - | - | 2 | - | - | 3 | 7 |
| 2015 | 2 | - | 15 | - | 7 | 10 | 5 | - | - | 60 | 10 | - | - | 9 | 6 | - | 7 |
| 2020 | 2 | - | - | 1 | - | 12 | - | - | - | 37 | 5 | - | - | - | - | - | 6 |
| 2025 | - | - | - | - | - | - | 2 | - | - | 38 | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | - | 0.7 | - | 0.0 | 0.0 | - | 0.0 | - | - |
| 2000 | - | 0.0 | - | 0.0 | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - |
| 2005 | - | 0.0 | 0.0 | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | 0.0 |
| 2010 | - | - | - | - | 0.0 | 0.2 | - | 0.0 | 0.1 | 0.5 | - | - | 0.0 | - | - | 0.0 | 0.0 |
| 2015 | 0.0 | - | 0.1 | - | 0.0 | 0.0 | 0.1 | - | - | 0.6 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 |
| 2020 | 0.0 | - | - | 0.0 | - | 0.1 | - | - | - | 0.5 | 0.0 | - | - | - | - | - | 0.0 |
| 2025 | - | - | - | - | - | - | 0.0 | - | - | 0.5 | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Packera multilobata (lobeleaf groundsel) | Penstemon comarrhenus (dusty beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1994 | 111 | - | 217 | - | 20 | - | - | 22 | 8 | 34 | - |
| 2000 | 3 | - | 217 | - | 7 | - | - | 30 | 18 | 5 | - |
| 2005 | 217 | - | 23 | 1 | 2 | 4 | 0 | 31 | 6 | 8 | - |
| 2010 | 20 | 2 | 30 | - | - | 1 | 23 | 30 | 11 | 5 | - |
| 2015 | 207 | - | 30 | 3 | 2 | 5 | 25 | 49 | - | 18 | - |
| 2020 | 62 | 1 | 33 | 3 | - | - | 5 | 32 | 5 | 20 | 6 |
| 2025 | 0 | - | 41 | 1 | - | - | 15 | 29 | 10 | 6 | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1994 | 0.5 | - | 4.5 | - | 0.0 | - | - | 0.1 | 0.0 | 0.1 | - |
| 2000 | 0.0 | - | 5.3 | - | 0.0 | - | - | 0.1 | 0.1 | 0.0 | - |
| 2005 | 8.0 | - | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | - |
| 2010 | 0.1 | 0.0 | 0.3 | - | - | 0.0 | 0.1 | 0.3 | 0.0 | 0.0 | - |
| 2015 | 1.5 | - | 0.6 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | - | 0.2 | - |
| 2020 | 0.2 | 0.0 | 0.6 | 0.0 | - | - | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 |
| 2025 | 0.0 | - | 0.6 | 0.0 | - | - | 0.1 | 0.1 | 0.2 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Bassia prostrata[pi] (forage kochia) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia fragilis (brittle pricklypear) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | |
| 1994 | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - |
| 2005 | 14.3 | - | - | 0.2 | - | - | 0.2 |
| 2010 | 15 | - | - | 0.2 | - | - | 0.2 |
| 2015 | 13.7 | - | - | 0.3 | - | - | 0.4 |
| 2020 | 13 | 0.1 | - | 0.2 | 0.1 | - | - |
| 2025 | 11.6 | - | - | - | 0.1 | - | - |
| year | Quadrat Cover (%) | | | | | | |
| 1994 | 14.2 | - | - | 0.6 | - | - | 0.0 |
| 2000 | 15.8 | - | - | 0.3 | - | 0.0 | 0.0 |
| 2005 | 12.6 | - | - | 0.0 | 0.0 | 0.0 | 0.0 |
| 2010 | 10.4 | - | - | 0.0 | 0.0 | - | 0.0 |
| 2015 | 9.8 | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 2020 | 15.4 | 0.0 | - | 0.3 | 0.0 | 0.0 | - |
| 2025 | 10.5 | - | - | 0.0 | 0.0 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1994 | 4020 | 20 | 2 | 64 | 35 | 22 | 19 | 14 | 55/79 |
| 2000 | 4140 | 20 | 3 | 28 | 69 | 30 | 32 | 32 | 54/80 |
| 2005 | 3320 | 80 | 2 | 48 | 50 | 22 | 3 | 13 | 61/80 |
| 2010 | 3880 | 40 | 16 | 39 | 45 | 36 | 29 | 39 | 57/87 |
| 2015 | 3640 | 60 | 14 | 44 | 42 | 10 | 62 | 34 | 50/79 |
| 2020 | 4060 | 60 | 18 | 27 | 55 | 21 | 14 | 58 | 61/82 |
| 2025 | 4000 | - | 6 | 45 | 50 | 6 | 18 | 69 | - / - |
| Bassia prostrata[pi] -- (forage kochia) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 16/28 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 2620 | 20 | 2 | 92 | 6 | 0 | 1 | 5 | 12/16 |
| 2000 | 1680 | - | 12 | 88 | 0 | 0 | 0 | 0 | 8/11 |
| 2005 | 440 | - | 5 | 96 | 0 | 0 | 0 | 0 | 20/24 |
| 2010 | 220 | 20 | 9 | 91 | 0 | 18 | 0 | 0 | 18/24 |
| 2015 | 520 | 60 | 50 | 50 | 0 | 0 | 0 | 4 | 16/23 |
| 2020 | 620 | 60 | 10 | 90 | 0 | 0 | 0 | 0 | 16/18 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1994 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 17/12 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 11/9 |
| 2010 | 80 | - | 25 | 75 | 0 | 25 | 25 | 50 | 14/12 |
| 2015 | 60 | - | 33 | 67 | 0 | 33 | 33 | 0 | 21/10 |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 18/14 |
| 2025 | 60 | - | 0 | 67 | 33 | 33 | 0 | 33 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1994 | 140 | 20 | 0 | 71 | 29 | 0 | 57 | 57 | 6/12 |
| 2000 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 8/14 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/24 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/22 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/17 |
| 2020 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 7/14 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 40 | 20 | 100 | 0 | 0 | 0 | 0 | 50 | - / - |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

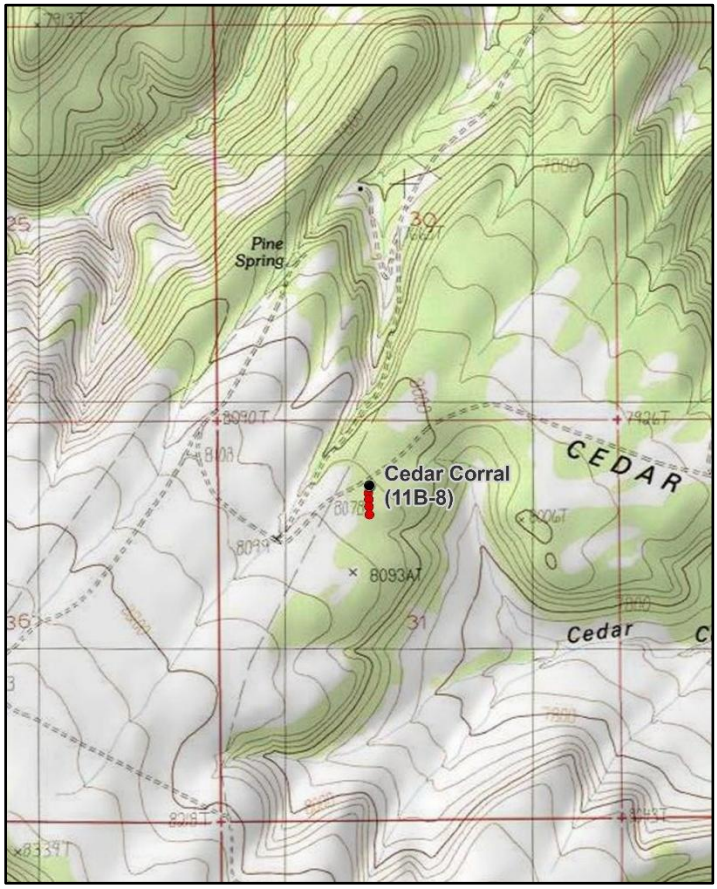
**Table 11B-07.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

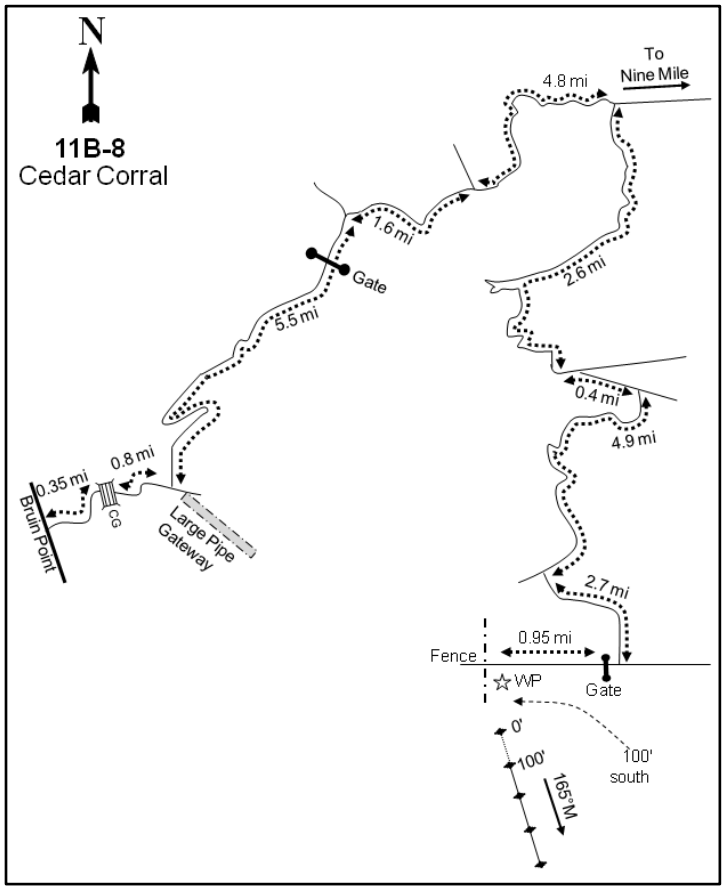
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 11 | - | 67 | 33 | - | - | 7.7 |
| 2020 | 6 | 33 | 67 | - | - | - | 8.3 |
| 2025 | 5 | - | 100 | - | - | - | 3.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 5 | - | 40 | 60 | - | - | 6.6 |
| 2020 | 11 | - | 100 | - | - | - | 2.0 |
| 2025 | 17 | 33 | 67 | - | - | - | 1.8 |

**Table 11B-07.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 17.7 | 4.6 | 0.7 | 11.3 | 0.0 | 10.0 | 0.0 | **44.3** | Poor |
| 2000 | 19.7 | -5.7 | 1.7 | 30.0 | 0.0 | 10.0 | 0.0 | **55.7** | Fair |
| 2005 | 17.9 | 0.0 | 1.2 | 27.6 | 0.0 | 10.0 | 0.0 | **56.7** | Fair |
| 2010 | 18.8 | 1.4 | 7.8 | 30.0 | 0.0 | 3.2 | 0.0 | **61.2** | Fair |
| 2015 | 17.1 | 2.5 | 7.2 | 30.0 | 0.0 | 6.9 | 0.0 | **63.7** | Fair-Good |
| 2020 | 16.5 | -1.3 | 9.0 | 30.0 | -0.1 | 3.3 | 0.0 | **57.4** | Fair |
| 2025 | 14.6 | 0.0 | 2.7 | 25.5 | 0.0 | 3.0 | 0.0 | **45.8** | Poor |

# CEDAR CORRAL - STUDY NO. 11B-8




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Twin Hollow SE; Township 13S, Range 16E, Section 31 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 571288 East 4389857 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 7801 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 92ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Belts 2, 3, 5: No Rebar |

**Directions to Site**

Driving from Bruin Point, take the middle fork and go 0.4 miles. Stay right at the fork just beyond a cattle guard and go 0.9 miles. Turn left at the intersection just before the large pipe gateway and proceed 0.5 miles to a fork. Stay right and go 4.2 miles to a gate. Continue 0.8 miles to a fork and remain traveling on the right. Go 1.6 miles to another fork and remain right. Proceed 4.8 miles to another fork and turn right. Go 2.6 miles to another fork. Stay right and drive 0.4 miles (while passing study 11B-07) to a fork. Stay right on the main road and go 4.8 miles to a junction. Turn left and continue 2.7 miles to a "T" intersection. Turn right and go through the steel gate (you will need the lock combination). Proceed 1.0 miles to a witness post (fence post surrounded by pile of rocks) on the left (south) side of the road. The 0-foot end of the baseline is 100 feet south of the witness post and is marked by browse tag #7801. There is a fence crossing the road approximately 200 yards southwest of the witness post.

| Site Information | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | GREEN RIVER |
| Elevation | 8,000ft (2,438m) |
| Aspect | Northeast |
| lope | 5% |
| Sample Dates | 09/15/1994, 08/08/2000, 08/09/2005, 08/18/2010, 07/21/2015, 06/29/2020, 06/30/2025 |

**Table 11B-08.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Bishop Ridge Pinyon and Juniper Removal | 3448 | November 2015-January 2016 | 224 |
| Seeding - Aerial Before | Bishop Ridge Pinyon and Juniper Removal | 3448 | December 2015 | 490 |

**Table 11B-08.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| Bishop Ridge | | | Aerial | Dec 2015 | 322 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Achnatherum hymenoides | Indian Ricegrass | Nezpar | 1.09 | 0.99 |
| G | Elymus lanceolatus | Thickspike Wheatgrass | | 1.09 | 0.97 |
| G | Koeleria macrantha | Prairie junegrass | Blue Mtn | 0.16 | 0.11 |
| G | Nassella viridula | Green Needlegrass | Lodorm | 0.62 | 0.25 |
| G | Poa secunda | Sandberg Bluegrass | UP Colorado Plateau | 0.47 | 0.35 |
| F | Achillea millefolium | Western Yarrow | Lincoln WA | 0.05 | 0.04 |
| F | Cleome serrulata | Rocky Mountain Beeplant | Sanpete UT | 0.16 | 0.14 |
| F | Cleome serrulata | Rocky Mountain Beeplant | Sanpete/Juab UT | 0.31 | 0.27 |
| F | Cleome serrulata | Rocky Mountain Beeplant | Sanpete/Sevier/Juab | 0.47 | 0.44 |
| F | Cleome serrulata | Rocky Mountain Beeplant | Utah UT | 0.07 | 0.06 |
| F | Helianthus annuus | Annual Sunflower | Box Elder UT | 0.47 | 0.36 |
| F | Linum perenne | Blue Flax | Appar | 1.09 | 0.93 |
| F | Medicago sativa | Alfalfa | Ranger | 1.86 | 1.74 |
| F | Onobrychis viciifolia | Sainfoin | Eski | 2.80 | 2.71 |
| F | Penstemon palmeri | Palmer Penstemon | Carbon UT | 0.59 | 0.40 |
| F | Ratibida columnifera | Prairie Coneflower | Stillwater | 0.47 | 0.42 |
| F | Sanguisorba minor | Small Burnet | | 2.80 | 2.40 |
| F | Sphaeralcea coccinea | Scarlet Globemallow | Uintah/Duchesne, UT | 0.20 | 0.11 |
| S | Atriplex canescens | Fourwing Saltbush | Juab/Carbon UT | 1.09 | 0.44 |
| S | Krascheninnikovia lanata | Winterfat | Millard UT | 0.62 | 0.44 |

## Wildlife Habitat and Vegetation History

**Table 11B-08.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | substantial | year-long |

**Table 11B-08.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Pinyon-Juniper/Mixed Mountain Brush | Phase I |
| 1994 | Pinyon-Juniper/Mixed Mountain Brush | Phase I |
| 2000 | Pinyon-Juniper/Mixed Mountain Brush | Phase I transitioning to Phase II |
| 2005 | Pinyon-Juniper/Mixed Mountain Brush | Phase I transitioning to Phase II |
| 2010 | Pinyon-Juniper/Mixed Mountain Brush | Phase I transitioning to Phase II |
| 2015 | Pinyon-Juniper/Mixed Mountain Brush | Phase I transitioning to Phase II |
| 2020 | Mixed Mountain Brush | Early Phase I |
| 2025 | Mixed Mountain Brush | Early Phase I |

## Site Notes

The study is located on the southern part of the West Tavaputs Plateau. The study was originally on state land, but the land was sold to Nutter Ranch between the 2000 and 2005 samplings. Cattle grazed the area in the past as part of the Green River allotment. However, there had been no cattle grazing on this allotment from 1994 until Nutter Ranch purchased the land. The grasses are rather depleted, with better elk forage found in the intermittent openings.

## Soils

**Table 11B-08.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 6.6 | 54.0 | 25.4 | 20.6 | 1.9 | 4.5 | 198.4 | 0.8 | 08/08/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | R048AY451UT |
| States and Transitions | 1986-2025 - Current Potential State: Community Phase 2.3 |

This site has existed as a mixed mountain brush plant community since study establishment in 1986 (Photos, Pre-1992 Data). The shrub community has included, but is not limited to, Utah serviceberry (*Amelanchier utahensis*), black sagebrush (*Artemisia nova*), mountain big sagebrush (*A. tridentata* ssp. *vaseyana*), and alderleaf mountain mahogany (*Cercocarpus montanus*). The cover of individual browse species has fluctuated over the years, but most species increased in cover following a 2015 chaining treatment (Table 11B-08.1, Table 11B-08.12). The herbaceous understory, while diverse, has remained sparse throughout the duration of the study (Table 11B-08.7). Since 2005, the introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed with low abundance and cover (Table 11B-08.10). Perennial forbs have been more abundant than their annual counterparts (Table 11B-08.11). Cover and density of twoneedle pinyon (*Pinus edulis*) increased over the study years and it was a co-dominant vegetation component through 2015 until the chaining treatment removed a majority of the trees from the site. Even though a tree removing-disturbance occurred, the site has the potential to transition from Phase I to Phase II of woodland succession over time due to the amount of trees left after treatment (Table 11B-08.1, Table 11B-08.12, Table 11B-08.14).

Mule deer winter range conditions have varied between fair and good since 1994. Winter habitat condition was considered fair in 2025 and was limited by reduced preferred browse recruitment; low perennial forb cover; and the presence of cheatgrass (Table 11B-08.6, Table 11B-08.7, Table 11B-08.13, Table 11B-08.15). Mule deer and elk presence has been low in most sample years, but presence for both species was moderate in 2025 (Table 11B-08.9). During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Utilization of preferred browse species has been mostly light. The heaviest utilization has been observed on alderleaf mountain mahogany. More specifically, mahogany utilization was heaviest in 2025 when 38% of plants sampled in density strips were moderately hedged and 55% were heavily utilized. Mountain snowberry (*Symphoricarpos oreophilus*) also had elevated utilization rates in 2025 (Table 11B-08.13). However, on-site observations noted little to no utilization on herbaceous species during the most recent sample year. It was also noted that the community may have been drought-affected as indicated by poor primary production and chlorotic leaves.

## Trend Summary Tables

**Table 11B-08.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 16.6 | 0.6 | 3.3 | - | - | - |
| 2000 | 23.7 | 0.8 | 4.7 | - | - | - |
| 2005 | 15.4 | 0.9 | 10.0 | 26.9 | 0.8 | 16.1 |
| 2010 | 15.9 | 0.3 | 6.2 | 35.5 | 1.4 | 14.6 |
| 2015 | 21.6 | 0.8 | 9.9 | 33.0 | 1.3 | 18.7 |
| 2020 | 34.7 | 1.2 | 0.0 | 38.1 | 1.6 | 0.3 |
| 2025 | 29.2 | 1.2 | 0.0 | 32.2 | 1.2 | 0.3 |

**Table 11B-08.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 220 | 40 | 303 | - | 3.5 | 0.1 | 7.9 |
| 2000 | - | 212 | 5 | 271 | - | 5.7 | 0.0 | 8.3 |
| 2005 | 60 | 175 | 170 | 244 | 0.7 | 3.2 | 0.5 | 6.0 |
| 2010 | 12 | 177 | 104 | 229 | 0.0 | 3.0 | 0.4 | 6.6 |
| 2015 | 69 | 177 | 17 | 276 | 1.1 | 3.1 | 0.1 | 10.7 |
| 2020 | 105 | 196 | 69 | 234 | 0.9 | 7.4 | 0.2 | 8.8 |
| 2025 | 20 | 215 | 8 | 182 | 0.1 | 3.8 | 0.0 | 3.0 |

**Table 11B-08.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 29.5 | 0.4 | 40.1 | 0.1 | 6.6 | 32.2 |
| 2000 | 22.8 | 1.9 | 52.2 | 0.7 | 8.1 | 37.1 |
| 2005 | 27.5 | 2.1 | 47.0 | 0.6 | 8.3 | 30.1 |
| 2010 | 27.9 | 0.0 | 51.6 | 0.4 | 9.3 | 34.4 |
| 2015 | 24.8 | 0.5 | 45.2 | 1.1 | 10.8 | 41.8 |
| 2020 | 19.0 | 0.3 | 56.1 | 0.3 | 8.4 | 46.8 |
| 2025 | 23.3 | 0.0 | 54.8 | 0.4 | 8.6 | 32.9 |

**Table 11B-08.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1994 | - | 16 | 8 | - | 2 | 29 |
| 2000 | - | 7 | 8 | - | 4 | 14 |
| 2005 | - | 2 | 5 | - | 2 | 40 |
| 2010 | - | 3 | 2 | - | - | 1 |
| 2015 | - | 3 | - | - | 3 | 5 |
| 2020 | - | 5 | 4 | - | 8 | 3 |
| 2025 | - | 5 | 6 | - | 6 | 2 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1994 | - | - | - | - | - | - |
| 2000 | - | 8.1 (19.9) | 10.0 (24.8) | 17.4 (43.0)* | 6.4 (15.8) | - |
| 2005 | 0.7 (1.8) | 2.0 (5.0) | 4.7 (11.6) | - | 7.5 (18.6) | - |
| 2010 | - | 4.7 (11.6) | 4.7 (11.6) | - | 1.2 (2.9) | - |
| 2015 | - | 10.7 (26.5) | 0.7 (1.7) | - | 5.2 (12.9) | - |
| 2020 | - | 7.4 (18.2) | 9.4 (23.2) | 52.3 (129.1)* | 7.0 (17.2) | - |
| 2025 | - | 22.1 (54.6) | 20.1 (49.7) | - | 7.0 (17.2) | - |

*Pellets per acre (ha)

**Table 11B-08.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1994 | 2 | 17 | - | 23 | 60 | 4 | 7 | 89 | 51 | 45 |
| 2000 | 18 | - | - | - | 71 | 10 | - | 71 | 60 | 47 |
| 2005 | 22 | 5 | 60 | 5 | 38 | 3 | 12 | 36 | 76 | 37 |
| 2010 | 3 | - | 12 | 7 | 5 | - | 3 | 55 | 60 | 86 |
| 2015 | 9 | 11 | 69 | 22 | 38 | - | 33 | 31 | 30 | 47 |
| 2020 | 15 | 34 | 105 | 57 | 47 | 6 | 17 | 26 | 26 | 16 |
| 2025 | 29 | - | 20 | 9 | 123 | 3 | - | 15 | 70 | 20 |
| year | Average Cover (%) | | | | | | | | | |
| 1994 | 0.0 | 0.1 | - | 0.4 | 0.2 | 0.0 | 0.2 | 1.7 | 0.5 | 0.4 |
| 2000 | 0.3 | - | - | - | 0.4 | 0.2 | - | 1.8 | 1.3 | 1.8 |
| 2005 | 0.2 | 0.0 | 0.7 | 0.0 | 0.5 | 0.1 | 0.1 | 0.4 | 0.9 | 0.9 |
| 2010 | 0.2 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.6 | 0.4 | 1.8 |
| 2015 | 0.2 | 0.1 | 1.1 | 0.2 | 0.7 | - | 0.4 | 0.6 | 0.4 | 0.5 |
| 2020 | 0.7 | 1.3 | 0.9 | 1.3 | 1.9 | 0.2 | 0.4 | 1.0 | 0.5 | 0.3 |
| 2025 | 1.0 | - | 0.1 | 0.2 | 1.5 | 0.0 | - | 0.2 | 0.7 | 0.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-08.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Antennaria dimorpha (low pussytoes) | Arabis drummondii (Drummond's rockcress) | Arabis perennans (perennial rockcress) | Artemisia dracunculus (tarragon) | Astragalus argophyllus (silverleaf milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chaenactis douglasii (Douglas' dustymaiden) | Chamaesyce (sandmat) | Chenopodium album[a] (lambsquarters) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | 28 | 69 | 3 | 16 | - | 5 | 2 | - | - | 6 | - | - | - | - | 1 | - |
| 2000 | - | 2 | 72 | - | - | - | 1 | - | - | 3 | - | - | - | - | - | - | - |
| 2005 | - | 13 | 57 | 4 | - | - | - | 3 | - | - | 17 | 1 | 4 | - | - | 5 | - |
| 2010 | - | 33 | 73 | 7 | - | - | 3 | - | 1 | - | 11 | - | 2 | 4 | - | 5 | 6 |
| 2015 | - | 36 | 75 | - | 13 | 2 | 2 | - | 4 | - | 4 | - | - | - | - | 4 | 4 |
| 2020 | 3 | 15 | 45 | 1 | - | - | 4 | 2 | - | - | 15 | - | - | - | 0 | - | 4 |
| 2025 | 1 | 5 | 33 | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | 0.1 | 2.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | 0.0 | - |
| 2000 | - | 0.1 | 2.5 | - | - | - | 0.0 | - | - | 0.0 | - | - | - | - | - | - | - |
| 2005 | - | 0.0 | 1.7 | 0.0 | - | - | - | 0.0 | - | - | 0.1 | 0.0 | 0.0 | - | - | 0.0 | - |
| 2010 | - | 0.1 | 2.7 | 0.0 | - | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 |
| 2015 | - | 0.3 | 3.5 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | - | 0.0 | - | - | - | - | 0.0 | 0.0 |
| 2020 | 0.0 | 0.1 | 1.3 | 0.0 | - | - | 0.1 | 0.0 | - | - | 0.1 | - | - | - | 0.0 | - | 0.0 |
| 2025 | 0.0 | 0.1 | 0.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Grindelia squarrosa (curlycup gumweed) | Heterotheca villosa (hairy false goldenaster) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Linum lewisii (Lewis flax) | Lomatium triternatum (nineleaf biscuitroot) | Machaeranthera grindelioides (rayless tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | - | - | 29 | 41 | - | 11 | 22 | - | - | 35 | 11 | - | - | 5 | - | 2 |
| 2000 | 2 | 1 | - | 14 | 22 | - | - | 46 | - | - | 40 | 3 | - | - | - | 3 | - |
| 2005 | 13 | - | - | 9 | 11 | - | - | 31 | 10 | - | 17 | 1 | 4 | - | - | 13 | 5 |
| 2010 | 24 | 7 | - | 4 | 11 | 5 | - | 29 | - | - | 10 | 2 | - | - | - | 3 | 3 |
| 2015 | 17 | 3 | 5 | 28 | 27 | 3 | 12 | 15 | - | - | 36 | 7 | - | 3 | - | - | 1 |
| 2020 | 44 | 9 | 8 | 19 | 8 | 7 | - | 25 | 2 | 11 | 15 | 1 | 0 | - | - | 1 | 2 |
| 2025 | 36 | - | 35 | 22 | - | - | - | 26 | - | - | 6 | - | 1 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | - | - | 0.1 | 0.1 | - | 0.2 | 0.2 | - | - | 0.8 | 0.0 | - | - | 0.0 | - | 0.0 |
| 2000 | 0.0 | 0.0 | - | 0.1 | 0.2 | - | - | 0.3 | - | - | 1.8 | 0.0 | - | - | - | 0.0 | - |
| 2005 | 0.0 | - | - | 0.1 | 0.2 | - | - | 0.3 | 0.0 | - | 0.6 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| 2010 | 0.1 | 0.0 | - | 0.0 | 0.2 | 0.0 | - | 0.6 | - | - | 0.6 | 0.0 | - | - | - | 0.0 | 0.0 |
| 2015 | 0.2 | 0.0 | 0.0 | 0.1 | 0.8 | 0.1 | 0.1 | 0.3 | - | - | 2.1 | 0.0 | - | 0.0 | - | - | 0.0 |
| 2020 | 0.8 | 0.0 | 0.0 | 0.3 | 0.1 | 0.2 | - | 0.6 | 0.0 | 1.2 | 1.5 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| 2025 | 0.5 | - | 0.1 | 0.1 | - | - | - | 0.5 | - | - | 0.2 | - | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Sedum lanceolatum (spearleaf stonecrop) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1994 | 1 | 3 | 18 | - | 40 | 239 | 9 | 3 | - | - |
| 2000 | - | 4 | 32 | 3 | 5 | 175 | - | - | - | - |
| 2005 | 1 | 4 | 10 | - | 163 | 178 | - | 1 | - | - |
| 2010 | - | 1 | 12 | - | 97 | 131 | - | - | - | 9 |
| 2015 | 1 | - | 33 | 2 | 6 | 170 | 1 | 7 | 4 | 14 |
| 2020 | - | - | 29 | - | 69 | 136 | - | 8 | 1 | 11 |
| 2025 | - | - | 10 | - | 7 | 87 | - | 1 | - | - |
| year | Average Cover (%) | | | | | | | | | |
| 1994 | 0.0 | 0.0 | 0.4 | - | 0.1 | 3.4 | 0.0 | 0.0 | - | - |
| 2000 | - | 0.0 | 0.9 | 0.0 | 0.0 | 2.5 | - | - | - | - |
| 2005 | 0.0 | 0.0 | 0.3 | - | 0.5 | 2.6 | - | 0.0 | - | - |
| 2010 | - | 0.0 | 0.7 | - | 0.4 | 1.2 | - | - | - | 0.0 |
| 2015 | 0.0 | - | 0.7 | 0.0 | 0.0 | 2.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| 2020 | - | - | 0.9 | - | 0.2 | 1.4 | - | 0.0 | 0.0 | 0.1 |
| 2025 | - | - | 0.1 | - | 0.0 | 0.9 | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-08.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia frigida[p] (prairie sagewort) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Opuntia fragilis (brittle pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 10.2 | - | 4.3 | 6.2 | 5.1 | 0.4 | 0.4 | - | 0.4 | - | 0 | - | 16.1 | - | 0.7 |
| 2010 | 11.3 | - | 4.6 | 11 | 5.6 | 0.7 | 1 | - | 0.2 | - | 0.2 | - | 14.6 | - | 2.3 |
| 2015 | 12.3 | - | 4.9 | 7.5 | 4.9 | 0.8 | 1 | - | 0.2 | - | 0.1 | - | 18.7 | - | 2.6 |
| 2020 | 13.9 | - | 6.2 | 9.6 | 4.6 | 0.7 | 1.1 | - | 0.3 | - | 0.1 | 0.1 | 0.3 | - | 3.1 |
| 2025 | 12 | - | 5.5 | 7.3 | 4.5 | 0.1 | 0.9 | - | - | - | 0.2 | 0.1 | 0.3 | - | 2.8 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | |
| 1994 | 4.4 | 0.0 | 3.4 | 6.5 | 1.9 | 0.3 | 0.5 | - | 0.0 | - | 0.1 | - | 3.3 | - | 0.2 |
| 2000 | 6.6 | - | 2.4 | 9.7 | 3.1 | 0.3 | 0.1 | 0.6 | 0.0 | - | 0.0 | - | 4.7 | - | 1.7 |
| 2005 | 4.2 | - | 3.5 | 4.0 | 2.1 | 0.3 | 0.5 | - | 0.4 | - | 0.0 | - | 10.0 | 0.0 | 1.2 |
| 2010 | 4.9 | - | 2.6 | 4.1 | 1.4 | 0.2 | 0.2 | - | 0.0 | - | 0.1 | 0.0 | 6.2 | - | 2.7 |
| 2015 | 7.4 | - | 4.2 | 5.5 | 2.3 | 0.4 | 0.6 | - | 0.0 | - | 0.2 | - | 9.9 | - | 2.0 |
| 2020 | 10.8 | - | 5.1 | 9.9 | 3.8 | 0.3 | 0.7 | - | 0.4 | - | 0.1 | 0.0 | 0.0 | - | 4.8 |
| 2025 | 9.3 | - | 4.2 | 7.8 | 4.0 | 0.6 | 1.0 | - | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | - | 3.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-08.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1994 | 680 | 60 | 12 | 82 | 6 | 21 | 0 | 3 | 118/147 |
| 2000 | 700 | 120 | 31 | 57 | 11 | 34 | 0 | 6 | 118/142 |
| 2005 | 680 | 40 | 32 | 53 | 15 | 18 | 38 | 6 | 132/148 |
| 2010 | 600 | 80 | 37 | 57 | 7 | 13 | 33 | 10 | 116/127 |
| 2015 | 680 | - | 15 | 85 | 0 | 38 | 3 | 24 | 105/119 |
| 2020 | 820 | 20 | 27 | 63 | 10 | 44 | 0 | 10 | 122/144 |
| 2025 | 800 | 80 | 5 | 95 | 0 | 28 | 5 | 0 | - / - |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1994 | 2540 | - | 9 | 81 | 9 | 32 | 8 | 2 | 27/45 |
| 2000 | 1780 | 40 | 5 | 85 | 10 | 30 | 2 | 3 | 26/45 |
| 2005 | 1920 | 2620 | 6 | 59 | 34 | 0 | 0 | 6 | 28/55 |
| 2010 | 2600 | 20 | 23 | 65 | 12 | 24 | 12 | 16 | 27/50 |
| 2015 | 2400 | 40 | 15 | 65 | 20 | 35 | 8 | 22 | 26/50 |
| 2020 | 1960 | 300 | 6 | 86 | 8 | 19 | 8 | 9 | 31/55 |
| 2025 | 1900 | - | 2 | 86 | 12 | 32 | 24 | 12 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | 3280 | 120 | 21 | 73 | 6 | 21 | 0 | 2 | 53/78 |
| 2000 | 3620 | 120 | 8 | 75 | 18 | 13 | 0 | 13 | 43/65 |
| 2005 | 2780 | 1100 | 18 | 56 | 26 | 22 | 15 | 14 | 46/68 |
| 2010 | 3980 | 260 | 38 | 48 | 14 | 17 | 7 | 19 | 44/71 |
| 2015 | 3480 | 40 | 20 | 58 | 22 | 26 | 6 | 28 | 39/62 |
| 2020 | 3160 | 760 | 19 | 73 | 8 | 35 | 8 | 10 | 41/60 |
| 2025 | 2480 | - | 5 | 64 | 32 | 47 | 28 | 32 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1994 | 260 | - | 15 | 85 | 0 | 15 | 8 | 0 | 135/134 |
| 2000 | 420 | 100 | 33 | 62 | 5 | 33 | 5 | 5 | 135/163 |
| 2005 | 520 | 200 | 73 | 27 | 0 | 15 | 15 | 0 | 131/141 |
| 2010 | 440 | 20 | 55 | 41 | 5 | 14 | 18 | 5 | 123/147 |
| 2015 | 440 | - | 27 | 64 | 9 | 55 | 9 | 9 | 89/102 |
| 2020 | 500 | - | 32 | 64 | 4 | 36 | 4 | 4 | 89/101 |
| 2025 | 580 | - | 3 | 97 | 0 | 38 | 55 | 3 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | 1420 | - | 6 | 87 | 7 | 6 | 0 | 3 | 9/19 |
| 2000 | 1000 | - | 4 | 86 | 10 | 16 | 2 | 8 | 10/16 |
| 2005 | 900 | 80 | 16 | 69 | 16 | 20 | 18 | 7 | 12/19 |
| 2010 | 880 | - | 2 | 93 | 5 | 2 | 0 | 5 | 12/23 |
| 2015 | 1220 | - | 5 | 93 | 2 | 54 | 0 | 2 | 15/23 |
| 2020 | 660 | - | 15 | 85 | 0 | 61 | 0 | 6 | 13/24 |
| 2025 | 800 | - | 0 | 100 | 0 | 20 | 78 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | 1160 | 20 | 10 | 88 | 2 | 0 | 0 | 2 | 22/21 |
| 2000 | 760 | - | 16 | 76 | 8 | 0 | 0 | 0 | 23/21 |
| 2005 | 520 | - | 35 | 54 | 12 | 23 | 8 | 4 | 34/33 |
| 2010 | 540 | - | 0 | 100 | 0 | 0 | 0 | 4 | 32/36 |
| 2015 | 800 | 20 | 13 | 85 | 3 | 5 | 0 | 8 | 31/29 |
| 2020 | 600 | - | 13 | 87 | 0 | 3 | 0 | 0 | 36/43 |
| 2025 | 560 | - | 7 | 89 | 4 | 7 | 11 | 4 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Echinocactus -- (echinocactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 12/15 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 8/8 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 480 | 20 | 13 | 83 | 4 | 4 | 0 | 0 | 12/16 |
| 2000 | 400 | - | 10 | 90 | 0 | 0 | 0 | 0 | 11/16 |
| 2005 | 800 | - | 20 | 78 | 3 | 0 | 0 | 3 | 18/22 |
| 2010 | 360 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/18 |
| 2015 | 380 | 100 | 32 | 68 | 0 | 0 | 0 | 0 | 19/24 |
| 2020 | 740 | - | 38 | 62 | 0 | 0 | 0 | 0 | 17/20 |
| 2025 | 260 | - | 15 | 85 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1994 | 320 | - | 31 | 38 | 31 | 25 | 0 | 6 | 7/18 |
| 2000 | 160 | - | 25 | 63 | 13 | 0 | 0 | 0 | 4/11 |
| 2005 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | 6/22 |
| 2010 | 280 | - | 29 | 71 | 0 | 0 | 0 | 0 | 6/26 |
| 2015 | 400 | - | 15 | 85 | 0 | 0 | 0 | 0 | 6/26 |
| 2020 | 280 | - | 7 | 79 | 14 | 0 | 0 | 14 | 6/16 |
| 2025 | 280 | - | 0 | 86 | 14 | 0 | 0 | 14 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/10 |
| 2005 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 5/14 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 6/11 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/11 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/19 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 140 | 20 | 29 | 71 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 140 | - | 43 | 57 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 160 | 20 | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 200 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 120 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ribes[P] -- (currant) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 74/87 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ribes montigenum[P] -- (gooseberry currant) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 103/121 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Rosa woodsii[P] -- (Woods' rose) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 46/45 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 27/15 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1994 | 700 | 20 | 9 | 89 | 3 | 3 | 3 | 0 | 38/74 |
| 2000 | 980 | - | 14 | 74 | 12 | 4 | 0 | 0 | 28/45 |
| 2005 | 880 | 20 | 23 | 77 | 0 | 0 | 0 | 0 | 29/42 |
| 2010 | 800 | - | 25 | 75 | 0 | 0 | 0 | 0 | 28/51 |
| 2015 | 1220 | - | 12 | 89 | 0 | 3 | 0 | 0 | 37/54 |
| 2020 | 1180 | - | 3 | 92 | 5 | 0 | 0 | 5 | 45/71 |
| 2025 | 920 | - | 4 | 89 | 7 | 46 | 15 | 7 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

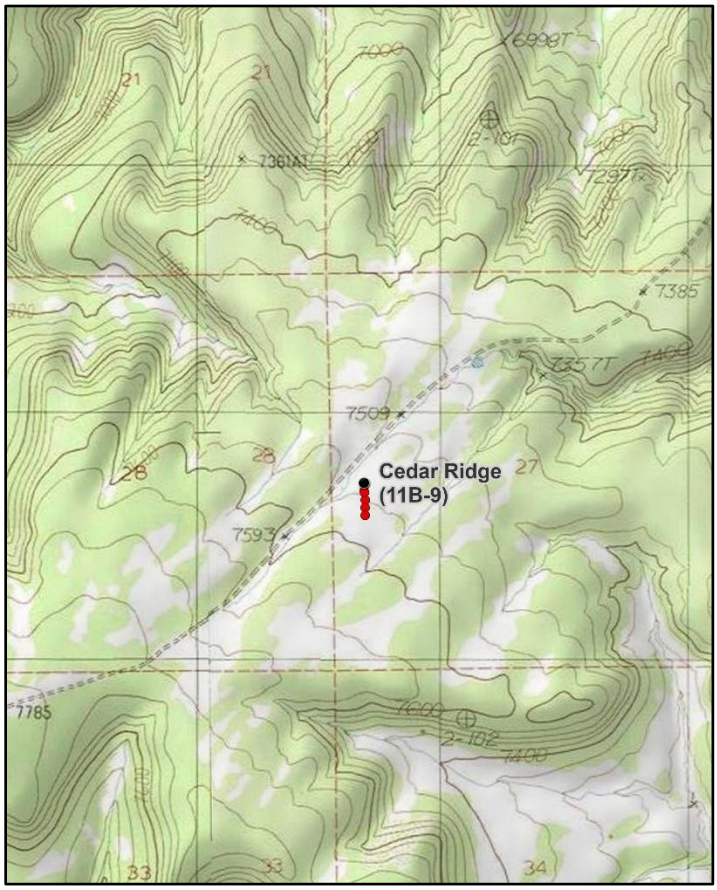
**Table 11B-08.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

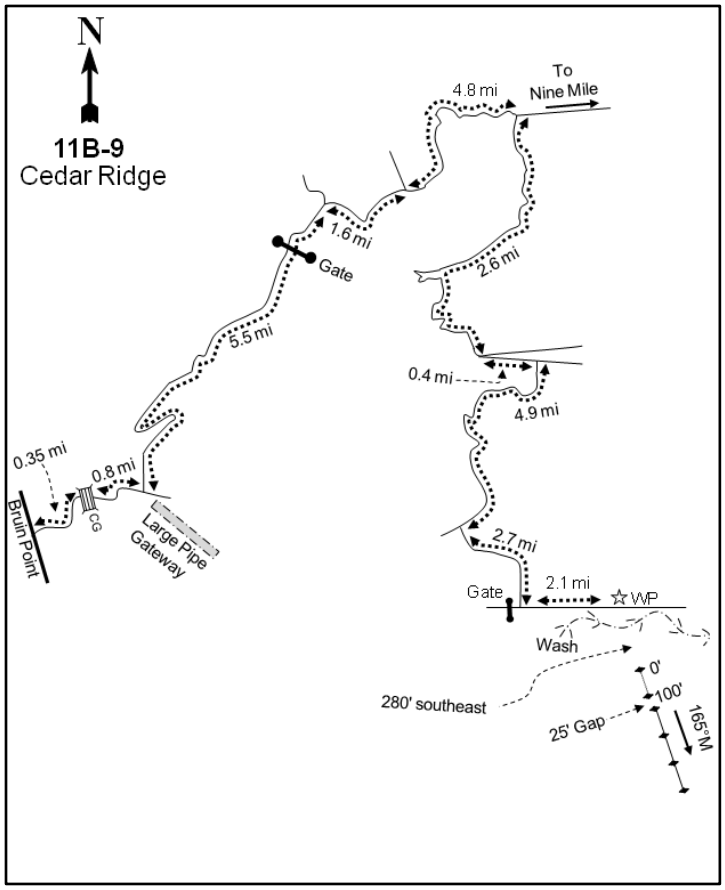
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1994 | 3 | - | - | - | - | - | 6.3 |
| 2000 | 9 | - | - | - | - | - | 20.5 |
| 2005 | 22 | 14 | 14 | 57 | - | 14 | 7.8 |
| 2010 | 14 | - | - | 64 | 18 | 18 | 13.4 |
| 2015 | 17 | - | 18 | 55 | 27 | - | 17.7 |
| 2020 | 6 | 33 | 33 | 33 | - | - | 4.0 |
| 2025 | 2 | - | 100 | - | - | - | 5.5 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2000 | 15 | - | - | - | - | - | 7.3 |
| 2020 | 7 | 60 | 20 | 20 | - | - | 8.8 |
| 2025 | 17 | - | 80 | 20 | - | - | 4.4 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1994 | 85 | - | - | - | - | - | 16.1 |
| 2000 | 147 | - | - | - | - | - | 9.8 |
| 2005 | 114 | 5 | 37 | 11 | 16 | 32 | 11.6 |
| 2010 | 117 | 10 | 30 | 10 | 15 | 35 | 11.6 |
| 2015 | 117 | - | 35 | 25 | 15 | 25 | 15.8 |
| 2020 | 18 | 40 | 50 | 10 | - | - | 4.7 |
| 2025 | 34 | 35 | 59 | - | 6 | - | 3.4 |

**Table 11B-08.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 22.3 | 13.3 | 7.6 | 7.1 | 0.0 | 10.0 | 0.0 | **60.3** | Fair |
| 2000 | 30.0 | 11.1 | 8.9 | 11.5 | 0.0 | 10.0 | 0.0 | **71.5** | Fair-Good |
| 2005 | 30.0 | 9.8 | 15.0 | 6.3 | -0.5 | 10.0 | 0.0 | **70.6** | Fair-Good |
| 2010 | 30.0 | 12.5 | 15.0 | 6.0 | 0.0 | 10.0 | 0.0 | **73.5** | Good |
| 2015 | 30.0 | 12.2 | 8.7 | 6.2 | -0.8 | 10.0 | 0.0 | **66.3** | Fair |
| 2020 | 30.0 | 12.7 | 10.0 | 14.9 | -0.7 | 10.0 | 0.0 | **76.9** | Good |
| 2025 | 30.0 | 12.1 | 2.1 | 7.6 | -0.1 | 6.0 | 0.0 | **57.7** | Fair |

# CEDAR RIDGE - STUDY NO. 11B-9




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Cedar Ridge Canyon S; Township 13S, Range 16E, Section 27 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 575634 East 4390909 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

**Directions to Site**

From Sunnyside, drive up Water Canyon to the summit (Bruin Point). At the summit, take the middle fork and go 0.4 miles. Stay right at the fork just beyond a cattle guard and go 0.9 miles. Turn left at the intersection just before the large pipe gateway and proceed 0.5 miles to a fork. Stay right and continue 4.2 miles to a gate. Travel 0.8 miles to a fork and remain right. Go 1.6 miles to another fork and stay right again. Proceed 4.8 miles to another fork and turn right. Go 2.6 miles to another fork. Stay right and keep going 0.4 miles (while passing the Cottonwood study 11B-07) to another fork. Stay on the main road (right) and go 4.8 miles to a junction. Turn left and drive 2.7 miles to a "T" intersection. Turn left and go 2.1 miles to a witness post on the left (north) side of the road. The transect starts 280 feet southeast of the witness post across the wash in the sagebrush flat. There is a 25-foot break in the baseline between the end of line 1 and 2. The end of line 1 is marked by a partially-buried rebar. The rest of the stakes, including the witness post, are green fence posts.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | GREEN RIVER |
| Elevation | 7,600ft (2,316m) |
| spect | Northeast |
| Slope | 3% |
| Sample Dates | 09/15/1994, 08/08/2000, 08/09/2005, 08/17/2010, 09/03/2015, 06/30/2020, 07/01/2025 |

## Wildlife Habitat and Vegetation History

**Table 11B-09.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | substantial | year-long |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 11B-09.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Black Sagebrush | Early Phase I |
| 1994 | Black Sagebrush | Early Phase I |
| 2000 | Black Sagebrush | Early Phase I |
| 2005 | Black Sagebrush | Early Phase I |
| 2010 | Black Sagebrush | Early Phase I |
| 2015 | Black Sagebrush | Early Phase I |
| 2020 | Black Sagebrush | Early Phase I |
| 2025 | Black Sagebrush | Early Phase I |

## Site Notes

This study is located on the wide southwest portion of Cedar Ridge within an extensive black sagebrush (*Artemisia nova*) park about six miles east of the Green River. Cedar Ridge is an important concentration area for wintering mule deer, although much of the use occurs on the lower limits of the ridge. The area is nearly level, but it is dissected by numerous deep, intermittent drainages that drain to the northeast.

## Soils

**Table 11B-09.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.0 | 47.3 | 32.2 | 20.6 | 2.4 | 5.3 | 243.2 | 0.7 | 08/08/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Shallow Loam (Black Sagebrush) |
| NRCS Ecological Site # | R048AY433UT |
| States and Transitions | 1986-1994 - Reference State: Community Phase 1.2<br>2000-2025 - Current Potential State: Community Phase 2.2 |

The vegetation on this site has remained in a generally stable state as a black sagebrush (*Artemisia nova*)-dominated plant community since the study was established in 1986 (Photos, Pre-1992 Data, Table 11B-09.12). The herbaceous understory has remained diverse and abundant. The understory has consisted mainly of native perennial grasses with the perennial grass needle and thread (*Hesperostipa comata*) as the dominant species. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed in the understory with low abundance and cover in previous sample years (Table 11B-09.10). Despite the low cover of cheatgrass, its presence signifies a transition in community structure that is less resilient to disturbance. Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been present, but they have not been common within the sample area (Table 11B-09.12, Table 11B-09.14); the site has been considered to be within Early Phase I of woodland succession throughout the sample period (Table 11B-09.4).

Mule deer winter range conditions have varied between poor and good-excellent since 1994. Winter habitat condition was considered to be poor in 2025 and was limited by reduced preferred browse recruitment; a disproportionate amount of decadent preferred browse plants; and low perennial grass and forb cover (Table 11B-09.7, Table 11B-09.13, Table 11B-09.15). Mule deer presence has been low in most sample years, but presence was moderate in 2015 and 2025. During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Elk presence has been similar to deer. Horse presence has been high in most sample years (Table 11B-09.9). Utilization of black sagebrush has been mostly light, but total moderate and heavy utilization of plants sampled in density strips reached 91% in 2025 (71% of which was moderate utilization) (Table 11B-09.13). However, on-site observations noted light utilization (10-20%) on prairie Junegrass (*Koeleria macrantha*) and Indian ricegrass (*Achnatherum hymenoides*), and little to no utiliation on forb species. It was also noted that the community may have been drought-affected as indicated by poor primary production and chlorotic leaves.

## Trend Summary Tables

**Table 11B-09.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 12.8 | 0.1 | - | - | - | - |
| 2000 | 21.5 | 0.0 | 0.2 | - | - | - |
| 2005 | 25.5 | 0.3 | 1.1 | 27.2 | 0.6 | 1.3 |
| 2010 | 23.6 | 0.2 | 0.7 | 29.5 | 0.5 | 1.5 |
| 2015 | 22.6 | 0.2 | 0.5 | 29.6 | 0.5 | 2.0 |
| 2020 | 29.6 | 0.1 | 1.6 | 32.5 | 0.4 | 2.1 |
| 2025 | 19.6 | 0.1 | 1.2 | 22.4 | - | 3.6 |

**Table 11B-09.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 367 | - | 276 | - | 9.2 | - | 6.4 |
| 2000 | 2 | 390 | - | 258 | 0.0 | 10.0 | - | 6.1 |
| 2005 | 18 | 352 | 151 | 282 | 0.1 | 9.5 | 0.4 | 7.2 |
| 2010 | - | 320 | 191 | 261 | - | 9.3 | 0.6 | 5.7 |
| 2015 | 1 | 358 | 36 | 262 | 0.0 | 14.3 | 0.1 | 7.2 |
| 2020 | 7 | 356 | 226 | 330 | 0.0 | 12.1 | 1.0 | 7.7 |
| 2025 | - | 273 | 3 | 208 | - | 5.1 | 0.0 | 2.2 |

**Table 11B-09.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 33.0 | 0.6 | 25.3 | 0.3 | 0.6 | 29.4 |
| 2000 | 31.4 | 2.7 | 43.0 | 1.7 | 0.3 | 36.4 |
| 2005 | 35.4 | 1.9 | 36.3 | 0.5 | 0.6 | 37.5 |
| 2010 | 33.1 | 0.3 | 43.5 | 0.8 | 0.1 | 41.5 |
| 2015 | 36.3 | 1.0 | 41.5 | 1.1 | 0.3 | 41.4 |
| 2020 | 32.7 | 1.8 | 38.8 | 3.6 | 0.5 | 39.7 |
| 2025 | 47.2 | 2.2 | 35.1 | 1.4 | 0.4 | 28.3 |

**Table 11B-09.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1994 | 1 | 9 | 5 | - | 12 | 12 |
| 2000 | - | 4 | 20 | - | 3 | 8 |
| 2005 | - | 10 | 19 | - | 11 | 17 |
| 2010 | - | 13 | 9 | - | 7 | 1 |
| 2015 | - | 10 | 1 | - | 5 | 12 |
| 2020 | - | 29 | 14 | - | 6 | 7 |
| 2025 | - | 21 | 8 | - | 12 | 2 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1994 | - | - | - | - | - | - |
| 2000 | - | - | 28.8 (71.2) | 8.7 (21.5)* | 16.8 (41.6) | - |
| 2005 | - | 19.4 (48.0) | 38.2 (94.4) | 8.7 (21.5)* | 27.9 (68.9) | - |
| 2010 | - | 18.7 (46.3) | 12.1 (29.8) | - | 13.4 (33.0) | - |
| 2015 | - | 21.5 (53.0) | - | - | 4.0 (10.0) | - |
| 2020 | - | 6.7 (16.6) | 14.7 (36.4) | - | 30.2 (74.6) | - |
| 2025 | - | 20.1 (49.7) | 8.1 (19.9) | - | 20.9 (51.6) | - |

*Pellets per acre (ha)

**Table 11B-09.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1994 | 3 | 50 | - | 22 | 8 | 307 | 28 | 60 | 8 | 53 |
| 2000 | 8 | 36 | 2 | 4 | 74 | 183 | - | 99 | 102 | 72 |
| 2005 | - | 32 | 18 | 34 | 16 | 216 | 110 | 37 | 188 | 42 |
| 2010 | - | 37 | - | 20 | 21 | 179 | 112 | 64 | 72 | 64 |
| 2015 | - | 29 | 1 | 28 | 54 | 173 | 128 | 46 | 102 | 54 |
| 2020 | - | 32 | 7 | 26 | 46 | 198 | 93 | 27 | 183 | 43 |
| 2025 | 4 | 19 | - | 5 | 78 | 52 | 112 | 9 | 115 | 16 |
| year | Average Cover (%) | | | | | | | | | |
| 1994 | 0.0 | 2.1 | - | 0.1 | 0.0 | 5.4 | 0.3 | 0.4 | 0.0 | 0.9 |
| 2000 | 0.1 | 0.9 | 0.0 | 0.0 | 0.8 | 4.6 | - | 2.4 | 0.6 | 0.5 |
| 2005 | - | 0.2 | 0.1 | 0.5 | 0.1 | 4.3 | 0.9 | 0.5 | 1.8 | 1.3 |
| 2010 | - | 0.5 | - | 0.3 | 0.2 | 4.2 | 1.9 | 0.5 | 0.5 | 1.1 |
| 2015 | - | 1.0 | 0.0 | 0.5 | 1.1 | 5.0 | 2.9 | 0.7 | 0.8 | 2.2 |
| 2020 | - | 1.2 | 0.0 | 0.3 | 1.1 | 3.7 | 1.3 | 0.8 | 3.0 | 0.8 |
| 2025 | 0.0 | 0.7 | - | 0.1 | 0.5 | 0.9 | 1.2 | 0.2 | 1.0 | 0.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-09.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Antennaria microphylla (littleleaf pussytoes) | Arabis perennans (perennial rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus purshii (woollypod milkvetch) | Astragalus tenellus (looseflower milkvetch) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja flava (yellow Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Comandra umbellata (bastard toadflax) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Eriogonum alatum (winged buckwheat) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | 96 | 3 | - | 3 | 3 | 12 | 44 | 4 | - | - | - | - | 19 | - | 2 | 2 |
| 2000 | 4 | 108 | - | 1 | 10 | 2 | 18 | 7 | 13 | 9 | - | - | - | 32 | 2 | 1 | 2 |
| 2005 | 1 | 38 | 16 | - | - | 6 | 0 | 26 | 1 | 4 | - | - | - | 12 | 5 | 0 | 3 |
| 2010 | 3 | 31 | 3 | 5 | - | 2 | 15 | 68 | 6 | 3 | - | 5 | - | 22 | - | 10 | 6 |
| 2015 | - | 62 | 4 | - | - | 3 | 6 | 22 | 9 | 14 | - | 2 | - | 1 | 1 | 5 | 15 |
| 2020 | 3 | 29 | 18 | - | - | 9 | - | - | 125 | 31 | 1 | - | - | 3 | - | 12 | 2 |
| 2025 | 21 | 22 | 4 | - | 3 | - | 5 | - | - | 7 | - | - | 4 | - | - | 2 | 10 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | 2.6 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | - | - | - | 0.1 | - | 0.0 | 0.0 |
| 2000 | 0.0 | 2.6 | - | 0.0 | 0.1 | 0.0 | 0.4 | 0.0 | 0.1 | 0.1 | - | - | - | 0.3 | 0.0 | 0.0 | 0.0 |
| 2005 | 0.0 | 0.3 | 0.1 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - | - | - | 0.1 | 0.0 | 0.0 | 0.0 |
| 2010 | 0.0 | 0.7 | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.3 | 0.0 | 0.0 | - | 0.1 | - | 0.4 | - | 0.0 | 0.4 |
| 2015 | - | 1.3 | 0.0 | - | - | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 | - | 0.0 | - | 0.0 | 0.0 | 0.2 | 0.2 |
| 2020 | 0.0 | 0.4 | 0.1 | - | - | 0.0 | - | - | 2.1 | 0.3 | 0.0 | - | - | 0.0 | - | 0.2 | 0.0 |
| 2025 | 0.1 | 0.2 | 0.0 | - | 0.0 | - | 0.1 | - | - | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Eriogonum umbellatum (sulphur-flower buckwheat) | Hedysarum boreale (Utah sweetvetch) | Heterotheca villosa (hairy false goldenaster) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Orobanche fasciculata (clustered broomrape) | Packera multilobata (lobeleaf groundsel) | Pedicularis centranthera (dwarf lousewort) | Penstemon caespitosus (mat penstemon) | Penstemon comarrhenus (dusty beardtongue) | Penstemon humilis (low beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 31 | 30 | - | - | - | - | 3 | 5 | - | 46 | - | 76 | 13 | - | 4 | 69 | 4 |
| 2000 | 33 | 13 | 3 | 3 | - | 2 | 5 | - | - | 53 | - | 51 | 11 | - | 5 | 64 | - |
| 2005 | 40 | 25 | - | - | 14 | 5 | 7 | 7 | - | 159 | - | 24 | 13 | - | - | 112 | - |
| 2010 | 46 | 15 | - | - | 8 | 7 | 4 | 1 | - | 21 | - | 60 | 44 | - | - | 111 | - |
| 2015 | 57 | 13 | - | - | 3 | 1 | 7 | 2 | 1 | 116 | - | 48 | 36 | 7 | - | 42 | - |
| 2020 | 38 | 22 | - | - | 1 | 5 | 4 | - | 1 | 145 | - | 58 | 102 | - | 3 | 122 | - |
| 2025 | 32 | - | - | - | - | - | - | - | - | - | 4 | 30 | 7 | 1 | - | 124 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.3 | 0.3 | - | - | - | - | 0.0 | 0.0 | - | 0.3 | - | 1.7 | 0.1 | - | 0.0 | 0.2 | 0.0 |
| 2000 | 0.5 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | - | 0.3 | - | 0.9 | 0.0 | - | 0.2 | 0.3 | - |
| 2005 | 1.0 | 1.5 | - | - | 0.0 | 0.0 | 0.4 | 0.0 | - | 2.4 | - | 0.1 | 0.1 | - | - | 0.6 | - |
| 2010 | 1.1 | 0.3 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.2 | - | 0.8 | 0.4 | - | - | 0.4 | - |
| 2015 | 1.4 | 0.3 | - | - | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 1.3 | - | 0.9 | 0.4 | 0.3 | - | 0.1 | - |
| 2020 | 1.1 | 0.8 | - | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.6 | - | 0.7 | 0.3 | - | 0.0 | 0.5 | - |
| 2025 | 0.5 | - | - | - | - | - | - | - | - | - | 0.1 | 0.3 | 0.0 | 0.0 | - | 0.7 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Polygonum douglasii[a] (Douglas' knotweed) | Sedum lanceolatum (spearleaf stonecrop) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) | Vicia (vetch) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 1994 | - | - | 67 | - | - | - | 1 | - |
| 2000 | - | - | 30 | 19 | - | 7 | - | - |
| 2005 | 146 | 5 | 20 | - | - | 18 | - | - |
| 2010 | 189 | 5 | 16 | 3 | 1 | 23 | - | 1 |
| 2015 | 31 | 6 | 10 | 8 | - | 15 | - | - |
| 2020 | 226 | 8 | 11 | - | - | 41 | - | - |
| 2025 | 3 | - | 8 | - | - | 29 | - | - |
| year | Average Cover (%) | | | | | | | |
| 1994 | - | - | 0.5 | - | - | - | 0.0 | - |
| 2000 | - | - | 0.1 | 0.1 | - | 0.0 | - | - |
| 2005 | 0.4 | 0.0 | 0.1 | - | - | 0.1 | - | - |
| 2010 | 0.5 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | - | 0.0 |
| 2015 | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.1 | - | - |
| 2020 | 1.0 | 0.1 | 0.0 | - | - | 0.3 | - | - |
| 2025 | 0.0 | - | 0.0 | - | - | 0.2 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-09.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 25.6 | - | 1.6 | 0.3 | 0.1 | 1 | - | 0.3 | 0.2 |
| 2010 | - | 27.1 | - | 2.4 | 0.3 | 0.2 | 1.5 | - | 0 | - |
| 2015 | - | 27.2 | - | 2.4 | 0.3 | - | 1.9 | - | 0.1 | 0.2 |
| 2020 | - | 30.4 | - | 2.1 | 0.2 | - | 1.6 | - | 0.5 | 0.2 |
| 2025 | - | 21.1 | - | 1.3 | - | - | 2.5 | - | 1.1 | - |
| year | Quadrat Cover (%) | | | | | | | | | |
| 1994 | - | 11.6 | - | 1.2 | - | 0.1 | - | 0.0 | - | - |
| 2000 | - | 20.6 | - | 0.8 | - | 0.0 | 0.2 | - | 0.0 | 0.0 |
| 2005 | 0.0 | 23.6 | 0.1 | 1.8 | 0.0 | 0.3 | 1.0 | - | 0.1 | 0.0 |
| 2010 | 0.1 | 21.3 | 0.0 | 2.2 | 0.0 | 0.2 | 0.7 | - | 0.0 | - |
| 2015 | 0.0 | 20.5 | - | 2.0 | 0.0 | 0.2 | 0.5 | - | 0.0 | 0.0 |
| 2020 | 0.1 | 25.6 | - | 3.9 | 0.0 | 0.1 | 1.2 | - | 0.4 | 0.0 |
| 2025 | 0.0 | 17.7 | 0.6 | 1.3 | - | 0.1 | 1.2 | - | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-09.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 16/26 |
| 2015 | - | - | - | - | - | - | - | - | 46/46 |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 100 | 0 | 25/47 |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | - / - |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1994 | 22840 | 1920 | 50 | 45 | 5 | 6 | 0 | 3 | 35/54 |
| 2000 | 25200 | 4780 | 8 | 84 | 8 | 8 | 1 | 4 | 24/38 |
| 2005 | 15740 | 36900 | 8 | 81 | 11 | 3 | 0 | 3 | 32/49 |
| 2010 | 19380 | 4080 | 25 | 65 | 10 | 17 | 17 | 11 | 23/46 |
| 2015 | 14520 | 120 | 21 | 66 | 13 | 31 | 8 | 46 | 31/50 |
| 2020 | 15380 | 420 | 21 | 71 | 8 | 7 | 3 | 14 | 30/51 |
| 2025 | 10680 | 40 | 3 | 63 | 35 | 71 | 20 | 47 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 40/67 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 60 | - | 0 | 67 | 33 | 67 | 33 | 100 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | 3840 | - | 3 | 93 | 4 | 0 | 0 | 2 | 10/19 |
| 2000 | 4400 | 40 | 5 | 93 | 2 | 0 | 0 | 2 | 9/21 |
| 2005 | 4540 | 360 | 8 | 82 | 10 | 33 | 36 | 3 | 14/23 |
| 2010 | 4020 | 40 | 3 | 97 | 1 | 8 | 0 | 1 | 13/24 |
| 2015 | 4220 | 100 | 7 | 92 | 2 | 16 | 62 | 3 | 13/25 |
| 2020 | 5620 | 20 | 3 | 95 | 2 | 4 | 93 | 2 | 10/20 |
| 2025 | 3480 | - | 1 | 86 | 14 | 13 | 82 | 14 | - / - |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/36 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 37/48 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 75 | 0 | 37/53 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. latifolius -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 49/44 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | 42/49 |
| 2000 | - | - | - | - | - | - | - | - | 52/53 |
| 2005 | - | - | - | - | - | - | - | - | 58/65 |
| 2010 | - | - | - | - | - | - | - | - | 76/111 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 57/81 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 540 | - | 11 | 89 | 0 | 0 | 0 | 0 | 14/18 |
| 2000 | 300 | - | 13 | 87 | 0 | 0 | 0 | 0 | 9/12 |
| 2005 | 400 | - | 10 | 90 | 0 | 0 | 0 | 0 | 22/23 |
| 2010 | 320 | - | 13 | 88 | 0 | 0 | 0 | 0 | 19/21 |
| 2015 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/27 |
| 2020 | 80 | 160 | 25 | 75 | 0 | 0 | 0 | 0 | 15/15 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 80 | 20 | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 80 | 20 | 25 | 75 | 0 | 25 | 0 | 0 | - / - |
| 2025 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1994 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/10 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 3/4 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/14 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 4/7 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | 80 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1994 | 140 | - | 0 | 86 | 14 | 0 | 0 | 0 | 14/22 |
| 2000 | 120 | - | 17 | 50 | 33 | 33 | 0 | 0 | 13/19 |
| 2005 | 200 | - | 20 | 80 | 0 | 0 | 0 | 0 | 22/29 |
| 2010 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/25 |
| 2015 | 80 | - | 0 | 100 | 0 | 25 | 50 | 0 | 18/28 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/21 |
| 2025 | 80 | - | 25 | 75 | 0 | 0 | 50 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

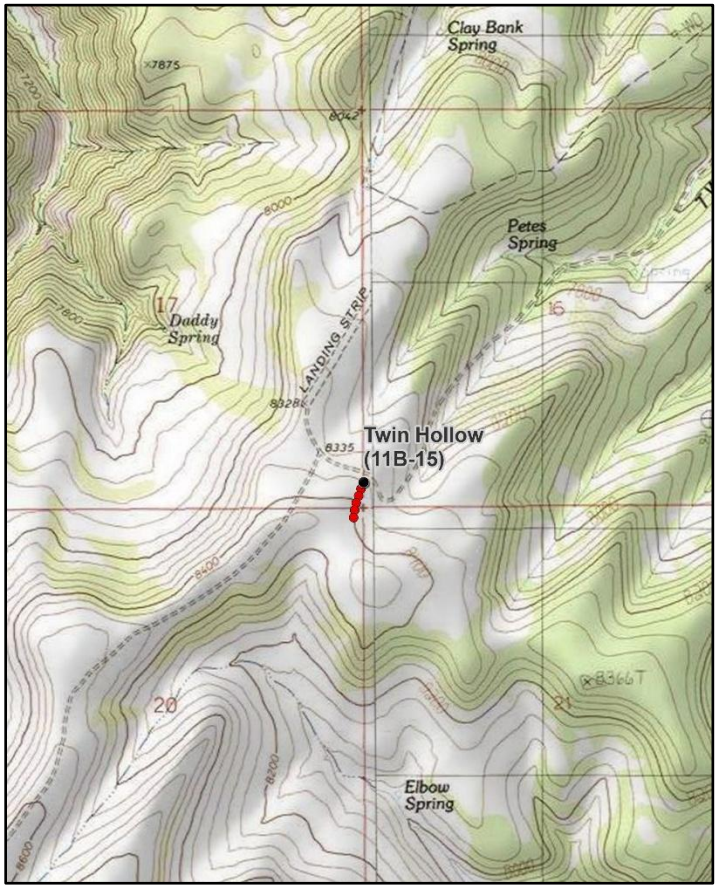
**Table 11B-09.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

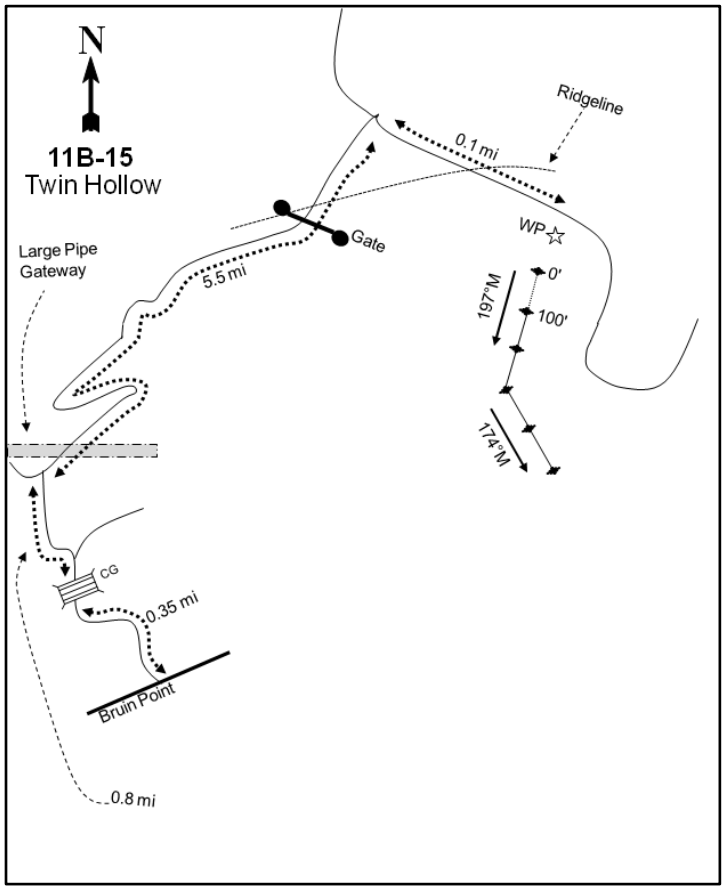
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1994 | 17 | - | - | - | - | - | 6.2 |
| 2000 | 41 | - | - | - | - | - | 9.3 |
| 2015 | 16 | 17 | - | 50 | 33 | - | 9.3 |
| 2020 | 18 | - | - | 100 | - | - | 12.7 |
| 2025 | 17 | 14 | 14 | 57 | 14 | - | 5.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1994 | 6 | - | - | - | - | - | 11.3 |
| 2000 | 20 | - | - | - | - | - | 8.3 |
| 2015 | 21 | 25 | 38 | 13 | 13 | 13 | 5.9 |
| 2020 | 17 | 14 | 43 | 29 | 14 | - | 6.9 |
| 2025 | 47 | 23 | 46 | 23 | - | 8 | 3.8 |

**Table 11B-09.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 16.0 | 13.6 | 15.0 | 18.4 | 0.0 | 10.0 | 0.0 | **73.0** | Good |
| 2000 | 26.8 | 12.6 | 3.9 | 20.0 | 0.0 | 10.0 | 0.0 | **73.3** | Good |
| 2005 | 30.0 | 11.7 | 3.8 | 19.1 | -0.1 | 10.0 | 0.0 | **74.5** | Good |
| 2010 | 30.0 | 12.3 | 11.7 | 18.6 | 0.0 | 10.0 | 0.0 | **82.6** | Good |
| 2015 | 30.0 | 11.3 | 9.8 | 28.6 | 0.0 | 10.0 | 0.0 | **89.7** | Good-Excellent |
| 2020 | 30.0 | 12.8 | 10.0 | 24.2 | 0.0 | 10.0 | 0.0 | **87.0** | Good |
| 2025 | 28.0 | 5.0 | 1.2 | 10.1 | 0.0 | 4.4 | 0.0 | **48.7** | Poor |

# TWIN HOLLOW - STUDY NO. 11B-15




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Bruin Point NE; Township 13S, Range 15E, Section 16 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 564219 East 4393387 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 31 |
| Transect Bearing | 197° magnetic (Lines 4-5: 174° magnetic) |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Sunnyside, go up Water Canyon to the summit (Bruin Point). At the summit, take the middle fork and travel 0.4 miles. Stay right at the fork just beyond a cattle guard and go 0.9 miles. Turn left at the intersection just before the large pipe gateway and proceed 0.5 miles to a fork. Stay right and go 4.2 miles to a gate. Continue 0.8 miles to a fork and remain right. Continue on the main road another 0.1 miles to a witness post on the right (south) side of the road. The 0-foot stake is 18 paces away from the witness post at a bearing of 212 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | GREEN RIVER |
| Elevation | 8,350ft (2,545m) |
| Aspect | Southeast |
| Slope | 20-25% |
| Sample Dates | 09/13/1994, 08/09/2000, 08/08/2005, 08/12/2010, 07/20/2015, 06/29/2020, 06/30/2025 |

## Wildlife Habitat and Vegetation History

**Table 11B-15.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | substantial | year-long |

**Table 11B-15.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1994 | Mixed Mountain Brush | No Encroachment |
| 2000 | Mixed Mountain Brush | Early Phase I |
| 2005 | Mixed Mountain Brush | No Encroachment |
| 2010 | Mixed Mountain Brush | No Encroachment |
| 2015 | Mixed Mountain Brush | No Encroachment |
| 2020 | Mixed Mountain Brush | Early Phase I |
| 2025 | Mixed Mountain Brush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 11B-15.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.0 | 44.0 | 31.4 | 24.6 | 4.6 | 3.5 | 291.2 | 0.7 | 08/09/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 19 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | R048AY451UT |
| States and Transitions | 1994-2025 - Reference State: Community Phase 1.2 |

This site has existed as a stable, minimally modified, mixed mountain brush plant community since the study was established in 1994. Utah serviceberry (*Amalanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and alderleaf mountain mahogany (*Cercocarpus montanus*) have consistently provided the most browse cover throughout the study years (Photos, Table 11B-15.12). Herbaceous vegetation has remained abundant and diverse, and it has been mostly composed of native perennial grasses and forbs (Table 11B-15.7, Table 11B-15.10, Table 11B-15.11). This site will likely remain in this or a similar state in future sample years unless a major disturbance occurs.

Mule deer winter range conditions have varied between good and excellent since 1994 (Table 11B-15.15). However, pellet transect data indicates that deer presence has been low in most sample years, but it was moderate in 2010. During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Elk decreased from having a high presence in 2000 to having a low presence in 2020. However, elk presence was moderate in 2025. Horse presence has increased over time and was considered to be high in 2020 and 2025. Utilization of preferred browse species has been considered to be light in most sample years. Totaled moderate and heavy utilization rates reached 74% for Utah serviceberry in 2015, 66% for mountain big sagebrush in 2025, and 84% or more for antelope bitterbrush (*Purshia tridentata*) in 2010 and 2025 (Photos, Table 11B-15.9, Table 11B-15.13). On-site observations for 2025 noted little to no utilization on the herbaceous community.

## Trend Summary Tables

**Table 11B-15.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 22.0 | 1.8 | - | - | - | - |
| 2000 | 29.0 | 0.8 | - | - | - | - |
| 2005 | 36.1 | 1.6 | - | 45.7 | 1.6 | - |
| 2010 | 30.6 | 1.7 | - | 49.9 | 2.9 | - |
| 2015 | 38.3 | 1.9 | - | 60.3 | 1.6 | - |
| 2020 | 47.0 | 3.1 | - | 57.8 | 3.8 | - |
| 2025 | 39.1 | 2.9 | - | 49.4 | 2.2 | - |

**Table 11B-15.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 336 | 105 | 356 | - | 9.3 | 0.5 | 10.8 |
| 2000 | - | 306 | 15 | 305 | - | 13.0 | 0.1 | 8.3 |
| 2005 | - | 326 | 118 | 297 | - | 14.8 | 0.4 | 10.1 |
| 2010 | - | 323 | 70 | 326 | - | 11.0 | 0.3 | 10.3 |
| 2015 | - | 365 | 47 | 337 | - | 17.6 | 0.3 | 11.7 |
| 2020 | - | 396 | 104 | 364 | - | 17.5 | 0.3 | 17.7 |
| 2025 | - | 335 | 27 | 293 | - | 13.9 | 0.1 | 9.5 |

**Table 11B-15.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 21.0 | 0.0 | 44.6 | 0.4 | 2.1 | 42.5 |
| 2000 | 17.1 | - | 62.4 | 2.8 | 1.4 | 48.5 |
| 2005 | 15.1 | - | 42.7 | 2.5 | 2.1 | 53.6 |
| 2010 | 14.1 | 0.0 | 47.1 | 2.8 | 0.8 | 53.7 |
| 2015 | 15.2 | 0.2 | 51.4 | 1.1 | 1.7 | 57.3 |
| 2020 | 13.9 | 0.0 | 49.4 | 5.7 | 1.9 | 55.0 |
| 2025 | 13.9 | 0.0 | 56.0 | 0.5 | 2.4 | 53.1 |

**Table 11B-15.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | | |
| 1994 | - | - | 5 | 11 | - | 4 | - | 5 |
| 2000 | - | - | 5 | 13 | - | 4 | - | 1 |
| 2005 | 1 | - | 13 | 20 | - | 5 | 1 | 5 |
| 2010 | - | - | 7 | 2 | - | - | - | - |
| 2015 | 1 | - | 4 | 2 | - | 2 | - | 14 |
| 2020 | 1 | - | 9 | 11 | - | 7 | - | 12 |
| 2025 | 1 | - | 9 | 11 | - | 6 | - | 6 |
| Year | Days Use Per Acre (ha) | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - |
| 2000 | - | 8.7 (21.5)* | 6.7 (16.6) | 68.3 (168.8) | - | 9.3 (23.0) | - | - |
| 2005 | 3.6 (9.0) | - | 5.3 (13.2) | 46.2 (114.2) | - | 8.1 (20.1) | - | - |
| 2010 | 2.2 (5.4) | - | 27.5 (67.9) | 12.8 (31.5) | - | 2.3 (5.7) | - | - |
| 2015 | 7.2 (17.9) | - | 8.7 (21.5) | 0.7 (1.7) | - | 13.4 (33.0) | - | - |
| 2020 | - | 17.4 (43.0)* | 5.3 (13.2) | 18.1 (44.7) | 8.7 (21.5)* | 22.6 (55.9) | 0.5 (1.2) | - |
| 2025 | 1.5 (3.6) | - | 2.7 (6.6) | 36.2 (89.4) | - | 29.6 (73.2) | - | - |

*Pellets per acre (ha)

**Table 11B-15.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus marginatus (mountain brome) | Bromus porteri (Porter brome) | Carex rossii (Ross' sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1994 | 7 | 57 | 23 | - | - | 9 | 26 | - | - | 24 | 142 | 62 | - | - | 159 |
| 2000 | - | 16 | 15 | - | - | 5 | 3 | - | - | 2 | 128 | 58 | - | - | 178 |
| 2005 | 15 | 10 | 0 | 5 | - | 15 | 39 | - | 61 | 20 | 5 | 48 | - | - | 232 |
| 2010 | 17 | 15 | 4 | 10 | - | 19 | 15 | - | 53 | 13 | 2 | 49 | - | - | 218 |
| 2015 | 9 | 5 | - | - | - | 31 | 87 | - | 62 | 43 | 1 | 118 | 2 | - | 228 |
| 2020 | 3 | 27 | 45 | - | 1 | 18 | 16 | 7 | 101 | 30 | 131 | 64 | 2 | 25 | 206 |
| 2025 | 34 | 21 | 7 | - | - | 9 | - | - | 28 | 15 | 108 | 41 | 2 | 19 | 205 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1994 | 0.1 | 0.8 | 0.6 | - | - | 0.0 | 0.3 | - | - | 0.2 | 4.3 | 1.3 | - | - | 1.8 |
| 2000 | - | 0.6 | 0.4 | - | - | 0.2 | 0.0 | - | - | 0.1 | 4.9 | 0.8 | - | - | 6.0 |
| 2005 | 0.4 | 0.4 | 0.0 | 0.0 | - | 0.4 | 0.6 | - | 2.1 | 0.4 | 0.0 | 0.8 | - | - | 9.6 |
| 2010 | 0.3 | 0.1 | 0.1 | 0.1 | - | 0.5 | 0.2 | - | 1.9 | 0.3 | 0.0 | 0.8 | - | - | 6.8 |
| 2015 | 0.2 | 0.2 | - | - | - | 0.4 | 3.0 | - | 2.1 | 1.0 | 0.0 | 3.0 | 0.0 | - | 7.6 |
| 2020 | 0.0 | 0.3 | 1.1 | - | 0.0 | 0.5 | 0.1 | 0.2 | 2.3 | 0.7 | 4.2 | 1.0 | 0.0 | 0.3 | 6.7 |
| 2025 | 2.1 | 0.5 | 0.0 | - | - | 0.1 | - | - | 0.6 | 0.1 | 3.6 | 0.5 | 0.1 | 0.1 | 6.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-15.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Arabis (rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus gunnisonii (Gunnison's mariposa lily) | Calylophus lavandulifolius (lavenderleaf sundrops) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Caulanthus crassicaulis[a] (thickstem wild cabbage) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 4 | 3 | 9 | 11 | 18 | 1 | - | - | 33 | 36 | - | - | 15 | 9 | 5 | 65 | 150 |
| 2000 | 5 | 1 | 5 | 2 | 1 | - | 0 | - | - | 11 | - | - | - | - | - | 10 | 201 |
| 2005 | 14 | 6 | 2 | 4 | 2 | 3 | 5 | - | 17 | 22 | - | - | - | - | 18 | - | 118 |
| 2010 | 11 | - | 3 | 2 | 1 | 10 | 11 | 4 | - | 23 | 29 | - | 5 | 3 | 1 | - | 196 |
| 2015 | 40 | 5 | 9 | - | 3 | 8 | 8 | - | 12 | 29 | 3 | - | 8 | - | 3 | 3 | 217 |
| 2020 | - | 16 | 8 | - | 7 | - | 8 | 1 | 18 | 53 | - | 1 | 1 | - | 2 | - | 149 |
| 2025 | 5 | - | 4 | 1 | 4 | 10 | 7 | - | - | 28 | - | - | - | 3 | 9 | - | 163 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | - | - | 0.4 | 0.2 | - | - | 0.0 | 0.0 | 0.0 | 0.4 | 2.1 |
| 2000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - | 0.1 | - | - | - | - | - | 0.1 | 3.4 |
| 2005 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.7 | 0.3 | - | - | - | - | 0.0 | - | 2.0 |
| 2010 | 0.1 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.4 | 0.0 | - | 0.2 | 0.2 | - | 0.0 | 0.0 | 0.0 | - | 2.4 |
| 2015 | 0.2 | 0.0 | 0.1 | - | 0.0 | 0.0 | 0.5 | - | 0.5 | 0.2 | 0.0 | - | 0.1 | - | 0.0 | 0.0 | 4.4 |
| 2020 | - | 0.0 | 0.1 | - | 0.1 | - | 0.6 | 0.0 | 0.4 | 0.9 | - | 0.0 | 0.0 | - | 0.0 | - | 1.9 |
| 2025 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | - | - | 0.1 | - | - | - | 0.0 | 0.0 | - | 1.8 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Hymenoxys richardsonii (pingue rubberweed) | Ipomopsis aggregata (scarlet gilia) | Linum lewisii (Lewis flax) | Lithospermum (stoneseed) | Lithospermum incisum (narrowleaf stoneseed) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | - | - | 110 | 14 | - | 54 | 150 | 5 | 15 | 30 | 16 | - | - | - | 12 | 30 |
| 2000 | 3 | 1 | - | 23 | 14 | - | 9 | 115 | - | 2 | - | 8 | - | - | - | - | 2 |
| 2005 | 76 | - | - | 22 | 4 | 11 | 2 | 154 | - | 13 | 10 | 40 | - | - | - | 2 | 6 |
| 2010 | 36 | 1 | - | 10 | 9 | 8 | 5 | 128 | 1 | 1 | 3 | 42 | - | - | - | 10 | - |
| 2015 | 69 | 1 | - | 14 | 12 | 6 | 50 | 91 | - | 7 | 1 | - | - | 27 | - | 16 | 9 |
| 2020 | 124 | 5 | - | 55 | - | 13 | 8 | 206 | 2 | 25 | 4 | 5 | 3 | 9 | 48 | 3 | 7 |
| 2025 | 35 | 7 | 3 | 33 | - | 8 | - | 138 | - | - | - | 1 | - | 10 | 42 | 1 | 1 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | - | - | 0.4 | 0.2 | - | 1.1 | 2.8 | 0.1 | 0.1 | 0.1 | 0.3 | - | - | - | 0.1 | 0.2 |
| 2000 | 0.0 | 0.0 | - | 0.1 | 0.1 | - | 0.1 | 1.3 | - | 0.0 | - | 0.2 | - | - | - | - | 0.0 |
| 2005 | 0.9 | - | - | 0.3 | 0.0 | 0.1 | 0.1 | 2.2 | - | 0.0 | 0.0 | 1.2 | - | - | - | 0.0 | 0.0 |
| 2010 | 0.3 | 0.0 | - | 0.0 | 0.0 | 0.2 | 0.0 | 2.1 | 0.0 | 0.0 | 0.0 | 0.6 | - | - | - | 0.1 | - |
| 2015 | 0.5 | 0.0 | - | 0.1 | 0.1 | 0.1 | 0.9 | 1.1 | - | 0.1 | 0.0 | - | - | 0.6 | - | 0.2 | 0.1 |
| 2020 | 2.0 | 0.0 | - | 0.3 | - | 0.1 | 0.0 | 5.7 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.8 | 0.2 | 0.0 | 0.1 |
| 2025 | 0.5 | 0.1 | 0.0 | 0.2 | - | 0.0 | - | 2.2 | - | - | - | 0.0 | - | 0.4 | 0.2 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Packera cana (woolly groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon palmeri (Palmer's penstemon) | Penstemon strictus (Rocky Mountain penstemon) | Penstemon watsonii (Watson's penstemon) | Petradoria pumila (rock goldenrod) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Sedum lanceolatum (spearleaf stonecrop) | Senecio integerrimus[a] (lambstongue ragwort) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1994 | - | 90 | 3 | - | 29 | - | 50 | 58 | 41 | - | - | - | 24 | 4 | - | - |
| 2000 | - | 38 | - | - | 22 | - | 58 | 27 | - | - | - | - | 8 | 8 | 1 | - |
| 2005 | - | 34 | 4 | - | 33 | 2 | 19 | 35 | 99 | - | - | - | 2 | 4 | 6 | - |
| 2010 | - | 48 | - | - | 51 | 16 | 36 | 48 | 54 | - | - | - | 7 | 9 | 18 | 1 |
| 2015 | - | 41 | 15 | - | 25 | 7 | 32 | 43 | 7 | - | 1 | - | 1 | 1 | 0 | - |
| 2020 | 1 | 62 | - | 9 | 62 | 0 | 32 | 82 | 102 | 1 | - | 3 | - | 4 | - | - |
| 2025 | 7 | 16 | 2 | 4 | 42 | 6 | 22 | 63 | - | - | - | 10 | - | 2 | 18 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1994 | - | 0.9 | 0.0 | - | 0.3 | - | 1.1 | 0.1 | 0.1 | - | - | - | 0.2 | 0.0 | - | - |
| 2000 | - | 0.2 | - | - | 0.7 | - | 1.6 | 0.2 | - | - | - | - | 0.0 | 0.0 | 0.0 | - |
| 2005 | - | 0.4 | 0.0 | - | 1.1 | 0.0 | 0.1 | 0.2 | 0.3 | - | - | - | 0.0 | 0.1 | 0.0 | - |
| 2010 | - | 1.2 | - | - | 0.6 | 0.2 | 0.7 | 0.6 | 0.1 | - | - | - | 0.1 | 0.2 | 0.1 | 0.0 |
| 2015 | - | 0.5 | 0.2 | - | 0.8 | 0.2 | 0.4 | 0.2 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - |
| 2020 | 0.0 | 1.4 | - | 0.0 | 1.6 | 0.0 | 0.7 | 0.5 | 0.3 | 0.0 | - | 0.0 | - | 0.0 | - | - |
| 2025 | 0.2 | 0.3 | 0.0 | 0.0 | 1.3 | 0.2 | 0.8 | 0.3 | - | - | - | 0.1 | - | 0.0 | 0.3 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-15.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia fragilis (brittle pricklypear) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 13.6 | 0.8 | 15.2 | 10 | 0.5 | 1.3 | 0.3 | - | 0.4 | 5.2 | - |
| 2010 | 16 | 1.3 | 12.9 | 11.9 | 0.5 | 2.5 | 0.3 | - | 1.4 | 5.9 | 0.1 |
| 2015 | 15.2 | 1.3 | 20.3 | 13.9 | 0.6 | 1.5 | 0.1 | - | 1.7 | 7.3 | - |
| 2020 | 10.8 | 1.5 | 19.7 | 16.1 | 0.8 | 3.2 | 0.6 | - | 2.5 | 6.4 | - |
| 2025 | 11.4 | 1 | 10.6 | 17.4 | 0.2 | 1.9 | 0.3 | - | 3.2 | 5.6 | - |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1994 | 5.0 | 1.4 | 6.5 | 6.0 | 0.8 | 1.3 | 0.5 | - | - | 2.4 | 0.0 |
| 2000 | 7.6 | 0.7 | 10.8 | 6.5 | 0.2 | 0.7 | 0.1 | - | 0.4 | 2.8 | - |
| 2005 | 9.3 | 0.4 | 13.0 | 7.9 | 0.9 | 1.4 | 0.2 | - | 0.8 | 3.7 | - |
| 2010 | 7.7 | 0.9 | 9.3 | 7.3 | 0.4 | 1.5 | 0.2 | 0.0 | 0.6 | 4.4 | 0.0 |
| 2015 | 10.1 | 0.9 | 14.0 | 8.4 | 0.8 | 1.6 | 0.2 | 0.1 | 1.1 | 3.1 | 0.0 |
| 2020 | 10.6 | 1.0 | 18.3 | 10.5 | 2.0 | 2.4 | 0.8 | - | 1.5 | 3.1 | - |
| 2025 | 8.7 | 2.5 | 7.4 | 13.6 | 1.3 | 2.6 | 0.3 | - | 1.9 | 3.9 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-15.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1994 | 1180 | 20 | 5 | 93 | 2 | 10 | 0 | 0 | 105/125 |
| 2000 | 1160 | 60 | 17 | 81 | 2 | 35 | 0 | 50 | 113/130 |
| 2005 | 1000 | - | 28 | 70 | 2 | 24 | 40 | 0 | 117/142 |
| 2010 | 1660 | 120 | 41 | 57 | 2 | 35 | 14 | 13 | 109/134 |
| 2015 | 1880 | - | 13 | 71 | 16 | 30 | 44 | 70 | 95/108 |
| 2020 | 2240 | 260 | 52 | 44 | 5 | 5 | 21 | 11 | 98/105 |
| 2025 | 2180 | 300 | 46 | 49 | 6 | 12 | 5 | 6 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1994 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1994 | 820 | 20 | 22 | 76 | 2 | 15 | 0 | 0 | 27/34 |
| 2000 | 1180 | - | 7 | 93 | 0 | 2 | 0 | 0 | 26/35 |
| 2005 | 600 | 1500 | 7 | 90 | 3 | 10 | 0 | 0 | 26/34 |
| 2010 | 1740 | 100 | 62 | 38 | 0 | 24 | 8 | 1 | 23/39 |
| 2015 | 1620 | 20 | 16 | 79 | 5 | 21 | 0 | 19 | 26/37 |
| 2020 | 780 | 20 | 44 | 56 | 0 | 3 | 0 | 0 | 27/45 |
| 2025 | 1540 | - | 5 | 78 | 17 | 16 | 14 | 20 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | 7300 | 80 | 10 | 87 | 3 | 3 | 1 | 1 | 43/49 |
| 2000 | 6380 | 80 | 10 | 81 | 10 | 11 | 0 | 2 | 44/60 |
| 2005 | 4740 | 240 | 4 | 85 | 11 | 22 | 23 | 3 | 54/69 |
| 2010 | 4620 | 120 | 11 | 79 | 10 | 45 | 8 | 18 | 51/84 |
| 2015 | 4840 | - | 5 | 83 | 12 | 44 | 9 | 19 | 50/68 |
| 2020 | 4520 | 240 | 18 | 74 | 8 | 17 | 1 | 8 | 53/78 |
| 2025 | 2900 | 20 | 3 | 63 | 35 | 15 | 51 | 42 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1994 | 2540 | 340 | 50 | 39 | 10 | 24 | 0 | 8 | 108/121 |
| 2000 | 2520 | 3560 | 57 | 41 | 2 | 32 | 2 | 2 | 123/123 |
| 2005 | 2980 | 2180 | 76 | 21 | 3 | 36 | 23 | 2 | 135/142 |
| 2010 | 2720 | 1760 | 44 | 54 | 2 | 14 | 17 | 2 | 123/124 |
| 2015 | 3420 | 280 | 56 | 40 | 5 | 25 | 11 | 21 | 99/87 |
| 2020 | 3660 | 780 | 66 | 32 | 2 | 19 | 24 | 7 | 112/118 |
| 2025 | 4760 | 200 | 48 | 47 | 5 | 8 | 6 | 6 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | 1700 | - | 4 | 97 | 0 | 0 | 0 | 0 | 11/15 |
| 2000 | 1300 | - | 0 | 97 | 3 | 2 | 0 | 3 | 8/13 |
| 2005 | 1360 | - | 3 | 96 | 2 | 22 | 27 | 2 | 13/22 |
| 2010 | 740 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/23 |
| 2015 | 1500 | 20 | 1 | 99 | 0 | 53 | 17 | 0 | 10/16 |
| 2020 | 1700 | - | 12 | 88 | 0 | 34 | 46 | 0 | 10/16 |
| 2025 | 1800 | - | 1 | 99 | 0 | 31 | 2 | 1 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | 5560 | - | 6 | 94 | 0 | 0 | 0 | 0 | 23/22 |
| 2000 | 1580 | - | 0 | 95 | 5 | 0 | 0 | 5 | 25/23 |
| 2005 | 2140 | - | 21 | 79 | 0 | 9 | 1 | 0 | 30/25 |
| 2010 | 3120 | - | 0 | 100 | 0 | 3 | 0 | 15 | 28/32 |
| 2015 | 2000 | - | 4 | 95 | 1 | 2 | 1 | 6 | 29/29 |
| 2020 | 2260 | - | 10 | 90 | 0 | 13 | 4 | 0 | 26/29 |
| 2025 | 2520 | - | 6 | 83 | 12 | 1 | 1 | 19 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 1340 | - | 12 | 88 | 0 | 0 | 0 | 0 | 15/13 |
| 2000 | 780 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/9 |
| 2005 | 640 | 40 | 9 | 88 | 3 | 0 | 0 | 0 | 25/19 |
| 2010 | 600 | - | 0 | 100 | 0 | 0 | 0 | 3 | 17/18 |
| 2015 | 620 | - | 3 | 97 | 0 | 0 | 0 | 0 | 23/20 |
| 2020 | 1440 | - | 15 | 85 | 0 | 0 | 0 | 0 | 16/16 |
| 2025 | 640 | - | 9 | 91 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1994 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 4/28 |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/21 |
| 2010 | - | - | - | - | - | - | - | - | 10/23 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/17 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 4/7 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 46/97 |
| 2005 | 100 | - | 40 | 60 | 0 | 60 | 0 | 0 | 48/72 |
| 2010 | 120 | - | 0 | 100 | 0 | 67 | 17 | 0 | 52/101 |
| 2015 | 180 | - | 22 | 78 | 0 | 11 | 44 | 0 | 53/111 |
| 2020 | 280 | 20 | 21 | 79 | 0 | 50 | 14 | 0 | 53/93 |
| 2025 | 400 | - | 15 | 70 | 15 | 15 | 70 | 15 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1994 | 2420 | - | 7 | 93 | 1 | 3 | 0 | 3 | 30/48 |
| 2000 | 1560 | - | 15 | 80 | 5 | 0 | 0 | 8 | 24/43 |
| 2005 | 1440 | - | 17 | 83 | 0 | 0 | 0 | 0 | 32/52 |
| 2010 | 1720 | 80 | 21 | 79 | 0 | 0 | 0 | 5 | 26/43 |
| 2015 | 2100 | - | 13 | 87 | 0 | 1 | 0 | 1 | 26/38 |
| 2020 | 1720 | 40 | 28 | 72 | 0 | 5 | 4 | 0 | 30/44 |
| 2025 | 1800 | - | 13 | 87 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1994 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/19 |
| 2000 | - | - | - | - | - | - | - | - | 14/25 |
| 2005 | - | - | - | - | - | - | - | - | 36/27 |
| 2010 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 20/19 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 22/19 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/27 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

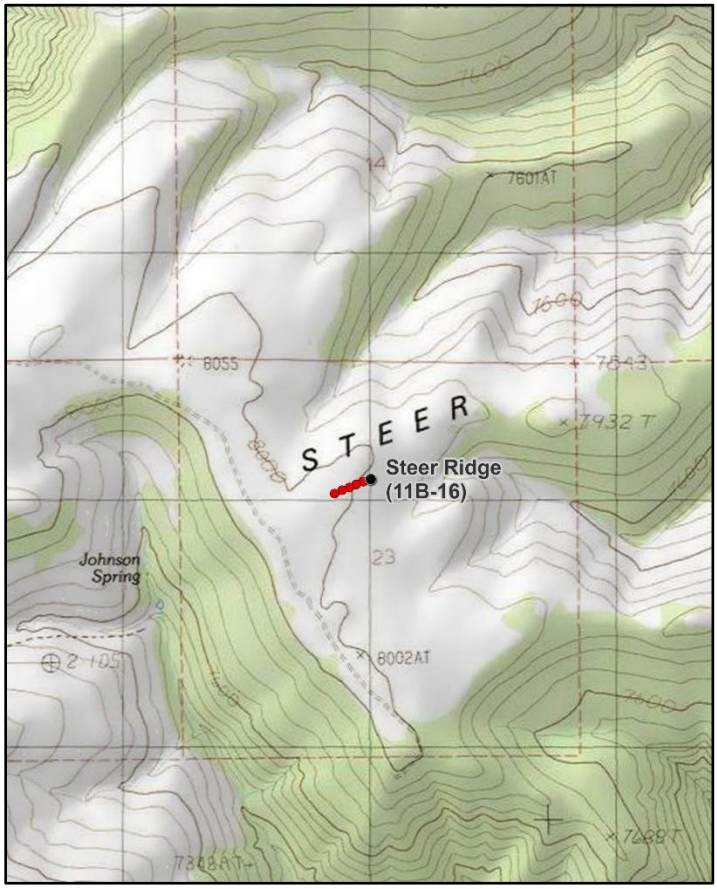
**Table 11B-15.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

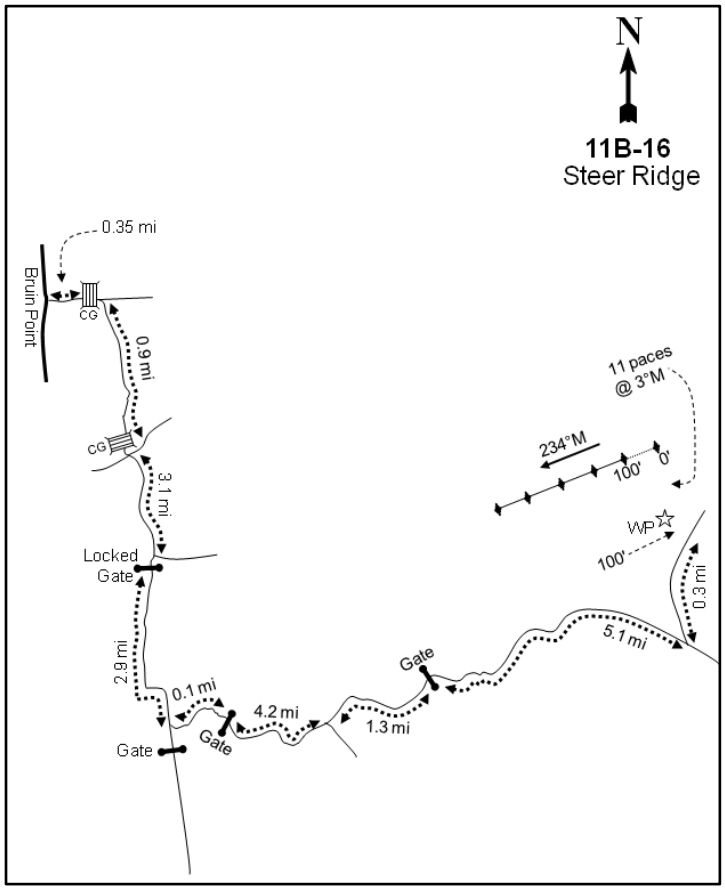
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2000 | 20 | - | - | - | - | - | 3.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2000 | 99 | - | - | - | - | - | 5.0 |
| 2020 | 4 | - | - | 67 | 33 | - | 10.3 |
| 2025 | 8 | - | 17 | 67 | 17 | - | 6.3 |

**Table 11B-15.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 25.2 | 4.0 | 3.8 | 8.8 | 0.0 | 8.2 | 0.0 | **50.0** | Poor |
| 1999 | 19.5 | 9.8 | 7.6 | 11.8 | 0.0 | 4.3 | 0.0 | **53.0** | Poor |
| 2004 | 30.0 | 9.6 | 6.7 | 17.8 | 0.0 | 5.3 | 0.0 | **69.4** | Fair-Good |
| 2009 | 30.0 | 10.4 | 10.4 | 8.9 | 0.0 | 2.3 | 0.0 | **62.0** | Fair |
| 2014 | 30.0 | 12.6 | 4.0 | 8.2 | 0.0 | 2.9 | 0.0 | **57.7** | Fair |
| 2019 | 30.0 | 10.5 | 6.3 | 13.5 | 0.0 | 9.3 | 0.0 | **69.6** | Fair-Good |
| 2024 | 30.0 | 9.6 | 9.9 | 10.4 | 0.0 | 1.3 | 0.0 | **61.2** | Fair |

# STEER RIDGE - STUDY NO. 11B-16




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steer Ridge Canyon N; Township 14S, Range 16E, Section 23 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 577946 East 4383285 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 32 |
| Transect Bearing | 234° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Sunnyside, go up Water Canyon to the summit (Bruin Point). Take the middle fork at the summit and go 0.4 miles. Stay right at the fork just beyond a cattle guard and travel 0.9 miles. Go through an intersection beyond another cattle guard and then proceed 3.1 miles to a locked gate just after a fork. Go through the gate and travel another 2.9 miles to a fork; turn left just before a gate. Proceed 0.1 miles to another gate, then continue 4.2 miles to a fork. Stay left and continue an additional 1.3 miles to another gate. Go through the gate, continue 5.1 miles, and turn left onto a two-track road. Drive north 0.3 miles to a witness post 100 feet off of the left (west) side of the road. The 0-foot stake is 11 paces away from the witness post at 3 degrees magnetic and is marked with browse tag #32.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | GREEN RIVER |
| Elevation | 8,000ft (2,438m) |
| Aspect | East |
| Slope | 4% |
| Sample Dates | 08/22/1994, 08/10/2000, 08/10/2005, 08/18/2010, 07/22/2015, 06/30/2020, 07/01/2025 |

## Wildlife Habitat and Vegetation History

**Table 11B-16.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | substantial | year-long |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 11B-16.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1994 | Mountain Big Sagebrush/Bitterbrush | No Encroachment |
| 2000 | Mountain Big Sagebrush/Bitterbrush | No Encroachment |
| 2005 | Mountain Big Sagebrush/Bitterbrush | No Encroachment |
| 2010 | Mountain Big Sagebrush/Bitterbrush | No Encroachment |
| 2015 | Mountain Big Sagebrush/Bitterbrush | No Encroachment |
| 2020 | Mountain Big Sagebrush/Bitterbrush | No Encroachment |
| 2025 | Mountain Big Sagebrush/Bitterbrush | Early Phase I |

## Site Notes

The study samples a mountain shrub community near the end of Steer Ridge, just before it drops off into the Green River. The mountain brush community type here is noticeably shorter in stature than that of the Twin Hollow (11B-15) study.

## Soils

**Table 11B-16.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.2 | 52.0 | 25.4 | 22.6 | 3.3 | 5.5 | 176.0 | 0.7 | 08/10/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Shallow Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY436UT |
| States and Transitions | 1994-2025 - Current Potential State: Community Phase 2.1 |

Since study establishment in 1994, the plant community on this site has been dominated by antelope bitterbrush (*Purshia tridentata*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Cover of antelope bitterbrush has remained relatively stable overall, while that of mountain big sagebrush has generally increased over the duration of the study (Photos, Table 11B-16.12). The herbaceous understory has remained diverse and abundant over the sample years. The introduced annual grass cheatgrass (*Bromus tectorum*) has been sampled, but with low abundance and cover (Table 11B-16.7, Table 11B-16.10, Table 11B-16.11). Twoneedle pinyon (*Pinus edulis*) was observed for the first time in 2025 with very low density (Table 11B-16.14). Without a major disturbance, it is likely that the site will continue to exist as an antelope bitterbrush and mountain big sagebrush-dominated plant community.

Mule deer winter range conditions have varied between fair-good and excellent since 1994. Winter habitat condition was considered good in 2025, and it was limited by reduced preferred browse recruitment; low perennial forb cover; and the presence of cheatgrass (Table 11B-16.7, Table 11B-16.13, Table 11B-16.15). However, pellet transect data indicates that deer presence has been moderate or high between 2010 and 2025. During the 2024/25 winter season the area had occurrences of collared mule deer (Wildlife Migration Initiative). Elk presence has remained high since 2000. Overall utilization of bitterbrush has been mostly moderate or heavy since 2005. However, utilization pressures on bitterbrush have decreased and use was considered to be light in 2025. Sagebrush utilization has increased over time, a trend that may be related to decreasing density; sagebrush utilization was heavy in 2025 (Photos, Table 11B-16.9, Table 11B-16.13). On-site observations for 2025 noted little to no utilization on the herbaceous community.

## Trend Summary Tables

**Table 11B-16.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 11.7 | 0.3 | - | - | - | - |
| 2000 | 14.9 | 0.4 | - | - | - | - |
| 2005 | 21.4 | 0.3 | - | 25.9 | 0.6 | - |
| 2010 | 20.3 | 0.4 | - | 33.2 | 0.3 | - |
| 2015 | 20.3 | 0.8 | - | 29.8 | 0.6 | - |
| 2020 | 27.0 | 0.4 | - | 32.4 | 0.7 | - |
| 2025 | 18.8 | 0.1 | - | 23.5 | 0.3 | - |

**Table 11B-16.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | - | 390 | 48 | 239 | - | 14.2 | 0.1 | 3.5 |
| 2000 | 1 | 390 | 24 | 183 | 0.0 | 17.7 | 0.1 | 3.3 |
| 2005 | 71 | 333 | 318 | 193 | 0.6 | 17.9 | 2.8 | 5.8 |
| 2010 | 23 | 380 | 212 | 199 | 0.4 | 15.9 | 0.9 | 3.4 |
| 2015 | 122 | 396 | 91 | 218 | 2.2 | 26.3 | 0.6 | 4.1 |
| 2020 | 115 | 373 | 200 | 249 | 0.7 | 25.8 | 0.5 | 7.0 |
| 2025 | 3 | 373 | 7 | 239 | 0.0 | 17.6 | 0.0 | 4.3 |

**Table 11B-16.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 20.2 | 0.1 | 19.9 | 2.0 | 6.6 | 32.4 |
| 2000 | 18.3 | 0.3 | 46.4 | 9.0 | 6.1 | 41.6 |
| 2005 | 25.1 | 1.0 | 31.0 | 8.1 | 5.8 | 43.0 |
| 2010 | 22.8 | - | 39.1 | 6.8 | 5.4 | 44.1 |
| 2015 | 13.1 | 0.1 | 44.2 | 6.9 | 4.6 | 53.9 |
| 2020 | 22.6 | 0.1 | 44.4 | 7.0 | 5.8 | 55.9 |
| 2025 | 23.7 | - | 41.4 | 7.1 | 6.7 | 36.0 |

**Table 11B-16.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1994 | 2 | 37 | 44 | - | 1 | - | 7 |
| 2000 | - | 21 | 53 | - | - | - | 7 |
| 2005 | - | 29 | 78 | 2 | - | 3 | 9 |
| 2010 | - | 45 | 27 | - | - | - | 2 |
| 2015 | 1 | 28 | 50 | 1 | - | - | 3 |
| 2020 | 1 | 41 | 47 | 4 | - | - | - |
| 2025 | - | 39 | 53 | - | - | - | 4 |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1994 | - | - | - | - | - | - | - |
| 2000 | - | 18.7 (46.3) | 82.4 (203.6) | - | - | - | - |
| 2005 | - | 12.8 (31.5) | 75.7 (187.0) | - | - | - | - |
| 2010 | 1.5 (3.6) | 43.6 (107.6) | 64.3 (158.9) | - | - | - | - |
| 2015 | 2.2 (5.4) | 49.6 (122.5) | 57.0 (140.7) | - | - | - | - |
| 2020 | 2.9 (7.2) | 48.9 (120.8) | 81.1 (200.3) | 26.2 (64.6)* | 0.6 (1.4) | - | - |
| 2025 | - | 25.5 (62.9) | 69.7 (172.1) | - | - | - | - |

*Pellets per acre (ha)

**Table 11B-16.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | |
| 1994 | 32 | 27 | - | - | - | 1 | 146 | 67 | 86 | 69 | 72 | 27 | 151 |
| 2000 | 9 | 0 | 4 | 1 | - | 1 | 160 | 78 | 5 | 25 | 187 | 39 | 147 |
| 2005 | 19 | 10 | 6 | 71 | 2 | - | 108 | 111 | 41 | 42 | 53 | 57 | 131 |
| 2010 | 11 | - | 4 | 23 | - | - | 71 | 170 | 49 | 50 | 82 | 77 | 123 |
| 2015 | 22 | - | 9 | 122 | 1 | - | 105 | 188 | 70 | 27 | 53 | 112 | 133 |
| 2020 | 23 | 2 | 6 | 115 | - | - | 69 | 185 | 88 | 51 | 37 | 113 | 101 |
| 2025 | 4 | - | 12 | 3 | - | 2 | 135 | 159 | 11 | 40 | 49 | 96 | 113 |
| year | Average Cover (%) | | | | | | | | | | | | |
| 1994 | 0.3 | 0.7 | - | - | - | 0.0 | 1.6 | 2.0 | 1.8 | 2.3 | 1.2 | 0.2 | 4.2 |
| 2000 | 0.2 | 0.0 | 0.2 | 0.0 | - | 0.0 | 3.8 | 3.1 | 0.0 | 0.6 | 4.7 | 0.2 | 4.9 |
| 2005 | 0.6 | 0.1 | 0.3 | 0.6 | 0.0 | - | 2.3 | 6.0 | 0.7 | 2.3 | 0.8 | 1.0 | 3.7 |
| 2010 | 0.5 | - | 0.3 | 0.4 | - | - | 0.7 | 6.7 | 0.8 | 1.9 | 1.2 | 0.6 | 3.2 |
| 2015 | 0.9 | - | 0.9 | 2.2 | 0.0 | - | 1.2 | 9.5 | 2.6 | 1.7 | 2.0 | 1.9 | 5.6 |
| 2020 | 1.0 | 0.0 | 0.8 | 0.7 | - | - | 1.2 | 9.7 | 2.9 | 1.9 | 1.1 | 2.3 | 5.0 |
| 2025 | 0.2 | - | 0.5 | 0.0 | - | 0.0 | 2.4 | 6.6 | 0.1 | 2.3 | 0.9 | 1.0 | 3.7 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-16.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Antennaria dimorpha (low pussytoes) | Arabis (rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus lentiginosus (freckled milkvetch) | Balsamorhiza sagittata (arrowleaf balsamroot) | Calochortus gunnisonii (Gunnison's mariposa lily) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 12 | - | 14 | 3 | 10 | 3 | - | - | 7 | 17 | - | 23 | 1 | 5 | - | 4 | 10 |
| 2000 | 6 | - | 8 | - | - | 7 | 3 | - | 3 | - | - | 22 | - | - | 4 | 18 | 9 |
| 2005 | 9 | 3 | 8 | 2 | 1 | - | 3 | - | 2 | 7 | 1 | - | 6 | 4 | - | 11 | 15 |
| 2010 | 4 | 2 | - | 2 | - | - | 2 | - | 3 | 16 | 15 | - | 3 | 2 | 5 | 22 | 13 |
| 2015 | 2 | - | - | 7 | - | - | 4 | - | 10 | 22 | 50 | - | 10 | 1 | 8 | 21 | 21 |
| 2020 | - | 0 | 16 | 3 | 4 | - | 3 | - | 4 | 1 | 34 | - | - | - | 5 | 16 | 41 |
| 2025 | 16 | - | 11 | - | - | - | 4 | 8 | 7 | 2 | 3 | - | - | - | - | 19 | 23 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.1 | - | 0.1 | 0.0 | 0.2 | 0.0 | - | - | 0.9 | 0.1 | - | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.1 |
| 2000 | 0.1 | - | 0.2 | - | - | 0.3 | 0.0 | - | 0.3 | - | - | 0.1 | - | - | 0.0 | 0.3 | 0.2 |
| 2005 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.0 | - | 1.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | - | 0.4 | 0.2 |
| 2010 | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.4 | 0.1 | 0.2 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| 2015 | 0.0 | - | - | 0.0 | - | - | 0.0 | - | 0.6 | 0.1 | 0.8 | - | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 |
| 2020 | - | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.0 | - | 0.5 | 0.0 | 1.4 | - | - | - | 0.0 | 0.1 | 0.7 |
| 2025 | 0.1 | - | 0.5 | - | - | - | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | - | - | - | - | 0.1 | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cryptantha[a] (annual cryptantha) | Cymopterus (springparsley) | Delphinium nuttallianum (twolobe larkspur) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum racemosum (redroot buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Hedysarum boreale (Utah sweetvetch) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Lithospermum ruderale (western stoneseed) | Lomatium (desertparsley) | Machaeranthera canescens (hoary tansyaster) | Oenothera (evening primrose) | Penstemon (beardtongue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | - | - | 18 | - | 13 | - | 23 | 2 | - | - | - | 12 | 33 | - | - | 2 |
| 2000 | - | - | - | 15 | - | 9 | - | 14 | 4 | - | - | 7 | 5 | 1 | - | 3 | 2 |
| 2005 | - | - | 16 | 14 | 5 | 7 | - | 19 | 25 | 4 | 58 | - | 8 | 20 | 1 | 1 | 1 |
| 2010 | - | - | 2 | 27 | - | 14 | - | 25 | 4 | 7 | 7 | - | 7 | 6 | 3 | 1 | 0 |
| 2015 | - | - | - | 16 | 2 | 9 | 2 | 20 | - | 7 | 31 | - | 4 | - | 4 | 2 | 2 |
| 2020 | 1 | 6 | 8 | 12 | 1 | 8 | - | 26 | 12 | 6 | 7 | - | 5 | 14 | - | - | - |
| 2025 | - | 8 | - | 9 | - | 4 | 4 | 31 | - | - | 2 | - | 4 | 15 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | - | - | 0.2 | - | 0.1 | - | 0.3 | 0.0 | - | - | - | 0.2 | 0.1 | - | - | 0.0 |
| 2000 | - | - | - | 0.3 | - | 0.1 | - | 0.1 | 0.0 | - | - | 0.0 | 0.2 | 0.0 | - | 0.0 | 0.0 |
| 2005 | - | - | 0.1 | 0.2 | 0.2 | 0.3 | - | 0.1 | 0.1 | 0.5 | 0.3 | - | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 |
| 2010 | - | - | 0.0 | 0.2 | - | 0.1 | - | 0.4 | 0.0 | 0.1 | 0.0 | - | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2015 | - | - | - | 0.3 | 0.0 | 0.1 | 0.0 | 0.4 | - | 0.3 | 0.2 | - | 0.2 | - | 0.0 | 0.0 | 0.0 |
| 2020 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.2 | - | 0.6 | 0.0 | 0.2 | 0.0 | - | 0.3 | 0.1 | - | - | - |
| 2025 | - | 0.0 | - | 0.1 | - | 0.0 | 0.0 | 0.5 | - | - | 0.0 | - | 0.1 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Penstemon caespitosus (mat penstemon) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1994 | 10 | 58 | 45 | 78 | - | - | 0 | - | - |
| 2000 | 2 | 53 | 16 | 62 | 5 | 3 | - | 6 | - |
| 2005 | - | 70 | 302 | 43 | - | - | 15 | 11 | - |
| 2010 | 6 | 87 | 209 | 33 | 0 | - | 4 | 9 | - |
| 2015 | 3 | 57 | 54 | 45 | 5 | - | 16 | 36 | - |
| 2020 | 8 | 112 | 189 | 42 | - | - | 5 | 61 | - |
| 2025 | 3 | 106 | 5 | 54 | 1 | 3 | - | 65 | 2 |
| year | Average Cover (%) | | | | | | | | |
| 1994 | 0.2 | 0.1 | 0.1 | 0.8 | - | - | 0.0 | - | - |
| 2000 | 0.0 | 0.3 | 0.0 | 0.7 | 0.0 | 0.0 | - | 0.0 | - |
| 2005 | - | 1.2 | 2.3 | 0.6 | - | - | 0.1 | 0.1 | - |
| 2010 | 0.0 | 0.4 | 0.9 | 0.5 | 0.0 | - | 0.0 | 0.0 | - |
| 2015 | 0.0 | 0.3 | 0.1 | 0.3 | 0.0 | - | 0.1 | 0.2 | - |
| 2020 | 0.1 | 1.3 | 0.5 | 0.5 | - | - | 0.0 | 0.6 | - |
| 2025 | 0.0 | 0.7 | 0.0 | 0.6 | 0.0 | 0.0 | - | 0.8 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-16.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia (pricklypear) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | 1 | 8.8 | 0.9 | 0.2 | 0.1 | - | 15.2 | - | 0.3 |
| 2010 | 1.3 | 16.8 | 0.9 | 0.1 | - | - | 14 | 0.2 | 0.2 |
| 2015 | 1.4 | 16 | 0.8 | 0.1 | - | - | 11.3 | 0.3 | 0.5 |
| 2020 | 2.3 | 15.3 | 0.7 | 0.4 | - | - | 13.4 | 0.7 | 0.3 |
| 2025 | 1.3 | 12.9 | 0.8 | 0.1 | - | 0.2 | 8.2 | 0.3 | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 1994 | 0.0 | 3.8 | 1.5 | 0.3 | 0.0 | 0.0 | 6.4 | 0.0 | 0.0 |
| 2000 | 1.2 | 6.4 | 0.7 | 0.2 | - | - | 6.6 | 0.0 | 0.2 |
| 2005 | 1.8 | 7.3 | 1.3 | 0.1 | 0.0 | 0.0 | 10.9 | 0.2 | 0.2 |
| 2010 | 2.1 | 10.3 | 0.8 | 0.1 | - | - | 7.0 | 0.0 | 0.4 |
| 2015 | 1.2 | 11.2 | 1.0 | 0.0 | - | 0.4 | 6.8 | 0.1 | 0.4 |
| 2020 | 2.1 | 12.0 | 1.5 | 0.0 | - | - | 10.9 | 0.4 | 0.4 |
| 2025 | 1.6 | 9.6 | 1.3 | 0.1 | - | 0.0 | 6.3 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-16.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1994 | 100 | - | 40 | 60 | 0 | 20 | 0 | 0 | 76/107 |
| 2000 | 160 | - | 13 | 88 | 0 | 50 | 0 | 25 | 74/104 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 100 | 0 | 106/142 |
| 2010 | 80 | - | 50 | 50 | 0 | 0 | 50 | 0 | 101/139 |
| 2015 | 100 | - | 20 | 60 | 20 | 40 | 40 | 60 | 92/123 |
| 2020 | 300 | - | 13 | 80 | 7 | 27 | 53 | 7 | 87/121 |
| 2025 | 140 | - | 43 | 43 | 14 | 29 | 0 | 43 | - / - |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 107/139 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 60 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | 2740 | 40 | 19 | 68 | 13 | 18 | 4 | 2 | 49/67 |
| 2000 | 2160 | 60 | 16 | 62 | 22 | 26 | 2 | 19 | 43/65 |
| 2005 | 3680 | 71680 | 53 | 40 | 8 | 15 | 8 | 3 | 57/74 |
| 2010 | 16580 | 460 | 72 | 28 | 1 | 17 | 6 | 1 | 47/68 |
| 2015 | 9520 | 20 | 40 | 55 | 5 | 41 | 23 | 10 | 45/61 |
| 2020 | 6640 | 40 | 22 | 65 | 13 | 36 | 31 | 11 | 48/66 |
| 2025 | 5060 | 20 | 6 | 80 | 14 | 22 | 69 | 15 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | 97/96 |
| 2000 | - | - | - | - | - | - | - | - | 93/97 |
| 2005 | - | - | - | - | - | - | - | - | 110/130 |
| 2010 | - | - | - | - | - | - | - | - | 101/138 |
| 2015 | - | - | - | - | - | - | - | - | 97/116 |
| 2020 | - | - | - | - | - | - | - | - | 98/120 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | 3440 | - | 0 | 98 | 2 | 8 | 0 | 2 | 15/21 |
| 2000 | 1780 | - | 6 | 82 | 12 | 1 | 0 | 5 | 11/19 |
| 2005 | 2260 | 380 | 5 | 89 | 5 | 42 | 6 | 6 | 17/25 |
| 2010 | 2320 | - | 10 | 91 | 0 | 5 | 6 | 0 | 16/24 |
| 2015 | 1660 | - | 7 | 93 | 0 | 34 | 5 | 0 | 13/20 |
| 2020 | 1660 | - | 0 | 99 | 1 | 18 | 1 | 1 | 13/23 |
| 2025 | 1620 | 40 | 5 | 93 | 3 | 21 | 64 | 4 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | 500 | - | 4 | 96 | 0 | 4 | 0 | 0 | 26/29 |
| 2000 | 460 | - | 0 | 96 | 4 | 0 | 0 | 0 | 26/25 |
| 2005 | 380 | - | 11 | 84 | 5 | 53 | 11 | 5 | 31/39 |
| 2010 | 600 | - | 10 | 90 | 0 | 0 | 0 | 0 | 31/40 |
| 2015 | 360 | - | 6 | 89 | 6 | 0 | 0 | 11 | 30/30 |
| 2020 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/33 |
| 2025 | 140 | 80 | 0 | 86 | 14 | 14 | 0 | 14 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 29/62 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/20 |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 10/19 |
| 2005 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/29 |
| 2010 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/23 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/25 |
| 2020 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 13/17 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1994 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | 8/59 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/40 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/56 |
| 2015 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/46 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/33 |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 25 | - / - |
| Purshia stansburiana[p] -- (Stansbury cliffrose) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | 1400 | - | 10 | 80 | 10 | 31 | 3 | 0 | 52/128 |
| 2000 | 1120 | - | 5 | 86 | 9 | 43 | 2 | 9 | 67/148 |
| 2005 | 1080 | - | 2 | 94 | 4 | 28 | 72 | 0 | 71/160 |
| 2010 | 1640 | - | 10 | 89 | 1 | 40 | 34 | 5 | 61/133 |
| 2015 | 1540 | 60 | 3 | 82 | 16 | 28 | 66 | 22 | 51/119 |
| 2020 | 1420 | 60 | 3 | 90 | 7 | 39 | 18 | 6 | 59/130 |
| 2025 | 1460 | - | 0 | 78 | 22 | 29 | 19 | 21 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1994 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 52/105 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 42/81 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 59/122 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 25 | 50/108 |
| 2015 | 60 | - | 0 | 100 | 0 | 33 | 0 | 0 | 43/70 |
| 2020 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 44/58 |
| 2025 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1994 | 160 | - | 13 | 88 | 0 | 13 | 0 | 0 | 19/29 |
| 2000 | 80 | - | 0 | 75 | 25 | 25 | 0 | 0 | 20/33 |
| 2005 | 140 | - | 0 | 100 | 0 | 71 | 0 | 0 | 25/43 |
| 2010 | 120 | - | 17 | 83 | 0 | 17 | 17 | 0 | 26/39 |
| 2015 | 140 | - | 29 | 71 | 0 | 14 | 0 | 0 | 27/35 |
| 2020 | 80 | - | 0 | 100 | 0 | 50 | 0 | 0 | 26/41 |
| 2025 | 60 | - | 0 | 67 | 33 | 33 | 33 | 33 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

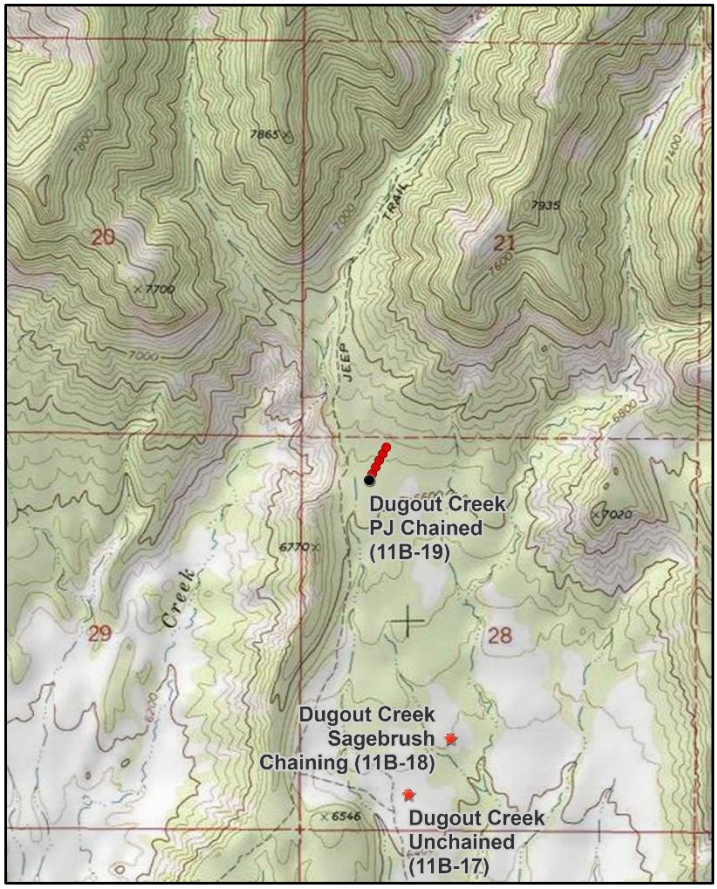
**Table 11B-16.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

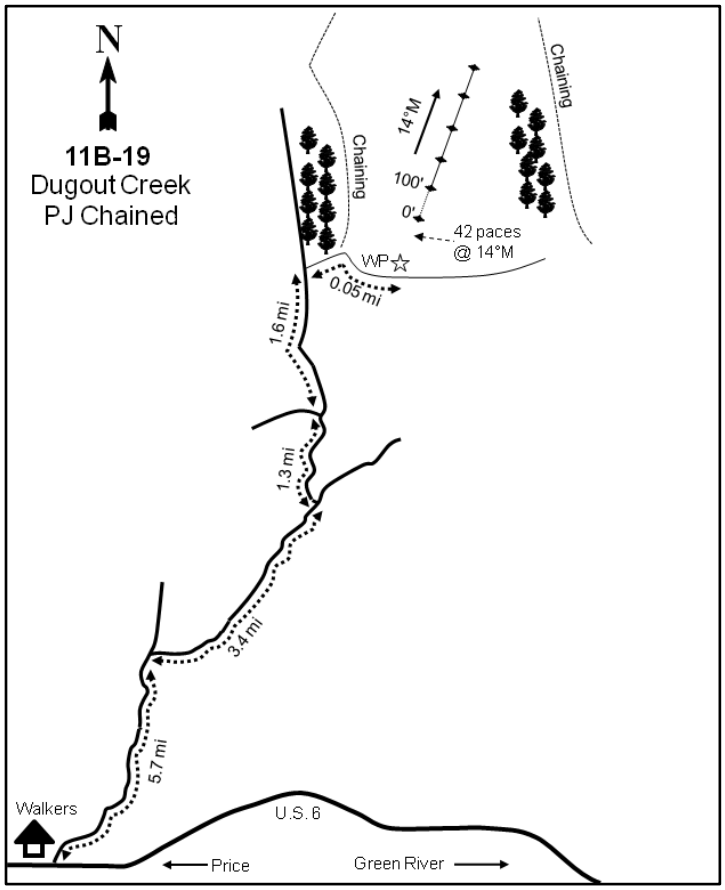
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2025 | 1 | - | 100 | - | - | - | 2.0 |

**Table 11B-16.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | 16.3 | 12.0 | 5.9 | 28.5 | 0.0 | 7.0 | 0.0 | **69.7** | Fair-Good |
| 2000 | 20.6 | 10.9 | 5.2 | 30.0 | 0.0 | 6.6 | 0.0 | **73.3** | Good |
| 2005 | 30.0 | 13.6 | 9.6 | 30.0 | -0.5 | 10.0 | 0.0 | **92.7** | Excellent |
| 2010 | 30.0 | 14.8 | 15.0 | 30.0 | -0.3 | 6.7 | 0.0 | **96.2** | Excellent |
| 2015 | 30.0 | 12.1 | 11.9 | 30.0 | -1.7 | 8.3 | 0.0 | **90.6** | Good-Excellent |
| 2020 | 30.0 | 12.0 | 6.2 | 30.0 | -0.5 | 10.0 | 0.0 | **87.7** | Good |
| 2025 | 30.0 | 10.2 | 2.9 | 30.0 | 0.0 | 8.6 | 0.0 | **81.7** | Good |

# DUGOUT CREEK PJ CHAINED - STUDY NO. 11B-19




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Pine Canyon SW; Township 13S, Range 12E, Section 28 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 535530 East 4391399 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 70 |
| Transect Bearing | 14° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from U.S. 6 just outside of Price, turn north by the Walkers Gas Station up Ninemile Canyon. Drive 5.7 miles to a main fork in the road. Take the right fork towards the Dugout Mine and travel 3.2 miles to a faint dirt road on the left. Turn left and go 1.3 miles to another fork. Stay right and drive 1.6 miles to a faint road on the right. Drive 0.1 miles into the chained area to a witness post on the left (north) side of the road. From the witness post walk 42 paces at 14 degrees magnetic to the 0-foot stake that is marked with browse tag #70.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SOLDIERS CANYON |
| Elevation | 6,680ft (2,036m) |
| Aspect | Southeast |
| Slope | 1-12% |
| Sample Dates | 07/22/1997, 08/24/2005, 05/19/2010, 05/14/2015, 05/13/2020, 05/15/2025 |

**Table 11B-19.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Dugout Creek Fuels Reduction and Habitat Restoration: Phase II | 1935 | May-September 2011 | 162 |
| Hand Crew - Lop and Scatter | Carbon and Emery County Habitat Restoration and Maintenance (Proposed) | 6706 | 2025 | 5824 |
| Chaining - Two-Way Unknown | Anadarko Mitigation Project 1995 | LTDL 174-502/504 | October 1995 | 160 |
| Seeding - Aerial Before | Anadarko Mitigation Project 1995 | LTDL 174-505 | October 1995 | 160 |
| Seeding - Dribbler | Anadarko Mitigation Project 1995 | LTDL 174-503 | October 1995 | 160 |

**Table 11B-19.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| P-J Woodland Dribbler Mix | | | Ground | Oct 1995 | 160 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| F | Medicago sativa | Alfalfa | Ladak | 1.00 | 0.00 |
| F | Penstemon palmeri | Palmer Penstemon | | 0.25 | 0.00 |
| F | Sanguisorba minor | Small Burnet | | 1.00 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 1.00 | 0.00 |
| S | Cercocarpus | Mountain Mahogany | | 0.25 | 0.00 |
| S | Purshia tridentata | Antelope Bitterbrush | | 0.50 | 0.00 |

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| P-J Woodland Aerial Seed Mix | | | Aerial | Oct 1995 | 160 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron desertorum | Crested Wheatgrass | Hycrest | 1.50 | 0.00 |
| G | Festuca ovina | Sheep Fescue | | 1.00 | 0.00 |
| G | Lolium perenne ssp. perenne | Perennial Ryegrass | | 0.50 | 0.00 |
| G | Thinopyrum intermedium | Intermediate Wheatgrass | | 1.00 | 0.00 |
| F | Linum lewisii | Lewis Flax | | 0.50 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 2.00 | 0.00 |
| F | Melilotus officinalis | Yellow Sweetclover | | 0.50 | 0.00 |
| F | Sanguisorba minor | Small Burnet | | 1.00 | 0.00 |
| S | Artemisia tridentata ssp. wyomingensis | Wyoming Big Sagebrush | | 1.50 | 0.00 |
| S | Bassia prostrata | Forage Kochia | | 1.00 | 0.00 |
| S | Ericameria nauseosa ssp. nauseosa var. hololeuca | Whitestem Rubber Rabbitbrush | | 1.50 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 11B-19.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | year-long |
| Shiras Moose | substantial | year-long |

**Table 11B-19.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Pinyon-Juniper/Black Sagebrush | Early Phase I |
| 2005 | Pinyon-Juniper/Black Sagebrush | Phase I |
| 2010 | Pinyon-Juniper/Black Sagebrush | Phase I |
| 2015 | Black Sagebrush | Early Phase I |
| 2020 | Black Sagebrush | Early Phase I |
| 2025 | Black Sagebrush | Early Phase I |

## Site Notes

The study is located at the base of the plateau in a twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) chaining that was done in October of 1996. In 2011, pinyon and juniper were again targeted and removed by lop and scatter (Table 11B-19.1).

## Soils

**Table 11B-19.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.2 | 54.4 | 23.8 | 21.8 | 3.8 | 9.8 | 134.4 | 0.7 | 07/22/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Upland Stony Loam (Pinyon-Utah Juniper) |
| NRCS Ecological Site # | R034BY330UT |
| States and Transitions | 1997-2010 - Seeded State: Community Phase 4.2<br>2015-2025 - Seeded State: Community Phase 4.1 |

Although chained in the fall of 1996, the plant community on this site was dominated by twoneedle pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and black sagebrush (*Artemisia nova*) from study establishment in 1997 through the 2010 sample year. When the site was read in 2015, however, the cover of pinyon and juniper had decreased due to a 2011 lop and scatter treatment (Table 11B-19.1); black sagebrush has been the dominant vegetation component since that time (Table 11B-19.12). Although the site is in Early Phase I of woodland succession as of 2025 (Table 11B-19.4), the persistent tree component indicates that there could be potential for infilling in the future (Table 11B-19.12, Table 11B-19.14). However, an additional lop and scatter project is scheduled for the area (Table 11B-19.1) that will likely remove many of the infilling trees. The herbaceous understory has remained moderately diverse, but it has lacked in abundance in many sample years (Table 11B-19.7). However, in 2015 and 2020 the cover of the introduced annual grass species cheatgrass (*Bromus tectorum*) increased substantially from the previous sample years, but it had decreased again by the time the site was read in 2025 (Table 11B-19.10).

Mule deer winter range conditions have varied between very poor and good since 1997. Winter habitat condition was considered fair-good in 2025, and it was limited by a lack of preferred browse recruitment; limited perennial grass cover; the near absence of perennial forb cover; and the presence of cheatgrass (Table 11B-19.7, Table 11B-19.13, Table 11B-19.15). Mule deer presence has ranged between moderate and high over the sample period, and elk presence has remained low or absent since 2005 (Table 11B-19.9). Utilization of black and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has remained light in most sample years. However, black sagebrush was more heavily utilized in 2005, and Wyoming big sagebrush was heavily used in 2010 and 2015 (Table 11B-19.13). On-site observations for 2025 noted moderate utilization (20-40%) on Indian ricegrass (*Achnatherum hymenoides*), and little to no utilization on forb species.

## Trend Summary Tables

**Table 11B-19.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 2.8 | - | 2.0 | - | - | - |
| 2005 | 9.5 | 0.2 | 4.0 | 11.2 | - | 3.5 |
| 2010 | 9.2 | 0.1 | 3.3 | 15.7 | 0.2 | 5.1 |
| 2015 | 15.4 | 0.2 | 0.4 | 18.5 | 0.1 | 0.5 |
| 2020 | 17.7 | 0.2 | 1.0 | 20.3 | - | 1.1 |
| 2025 | 22.8 | 0.0 | 1.9 | 26.0 | 0.1 | 1.6 |

**Table 11B-19.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | - | 104 | 118 | 188 | - | 0.9 | 2.5 | 4.7 |
| 2005 | 11 | 260 | 59 | 123 | 0.1 | 9.6 | 0.9 | 5.4 |
| 2010 | 20 | 191 | 92 | 109 | 0.4 | 6.2 | 0.6 | 2.5 |
| 2015 | 192 | 170 | 85 | 66 | 10.4 | 9.0 | 0.9 | 1.8 |
| 2020 | 325 | 188 | 48 | 84 | 6.7 | 11.0 | 0.2 | 1.2 |
| 2025 | 145 | 177 | 32 | 36 | 0.8 | 8.8 | 0.1 | 0.3 |

**Table 11B-19.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 18.3 | 0.9 | 50.1 | 6.7 | 8.5 | 13.5 |
| 2005 | 20.7 | - | 39.6 | 4.5 | 15.0 | 28.6 |
| 2010 | 19.6 | 0.0 | 48.8 | 3.6 | 9.6 | 23.9 |
| 2015 | 17.6 | 0.1 | 45.2 | 4.1 | 12.6 | 37.1 |
| 2020 | 15.3 | 0.1 | 52.8 | 5.5 | 12.3 | 37.3 |
| 2025 | 22.0 | 0.9 | 53.4 | 4.2 | 10.7 | 32.7 |

**Table 11B-19.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1997 | - | 6 | - | 6 |
| 2005 | - | 14 | 2 | 43 |
| 2010 | - | 20 | 2 | 20 |
| 2015 | - | 7 | - | 8 |
| 2020 | - | 34 | 2 | 27 |
| 2025 | - | 45 | - | 13 |
| Year | Days Use Per Acre (ha) | | | |
| 1997 | - | - | - | - |
| 2005 | 6.5 (16.1) | 40.9 (101.0) | 12.8 (31.5) | - |
| 2010 | 0.7 (1.8) | 28.8 (71.2) | 12.8 (31.5) | - |
| 2015 | - | 46.9 (115.9) | 1.3 (3.3) | - |
| 2020 | 5.1 (12.6) | 58.3 (144.0) | 4.7 (11.6) | - |
| 2025 | 2.9 (7.2) | 32.2 (79.5) | - | - |

**Table 11B-19.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Dactylis glomerata[i] (orchardgrass) | Elymus elymoides (squirreltail) | Elymus trachycaulus (slender wheatgrass) | Pascopyrum smithii (western wheatgrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1997 | - | 50 | - | 16 | 27 | 44 | - | 2 | - | - | - |
| 2005 | 3 | 112 | 11 | 3 | 140 | 49 | - | 3 | 0 | - | - |
| 2010 | 2 | 159 | 20 | - | 15 | 23 | - | 5 | 5 | - | - |
| 2015 | 4 | 134 | 192 | 2 | 12 | 50 | 4 | 5 | 3 | - | - |
| 2020 | 19 | 119 | 325 | - | 15 | 0 | 8 | 10 | 0 | 20 | 36 |
| 2025 | 8 | 149 | 145 | - | 8 | - | 5 | 1 | 2 | - | 32 |
| year | Average Cover (%) | | | | | | | | | | |
| 1997 | - | 0.3 | - | 0.1 | 0.2 | 0.3 | - | 0.0 | - | - | - |
| 2005 | 0.1 | 4.7 | 0.1 | 0.0 | 3.7 | 1.1 | - | 0.0 | 0.0 | - | - |
| 2010 | 0.0 | 5.3 | 0.4 | - | 0.1 | 0.7 | - | 0.0 | 0.0 | - | - |
| 2015 | 0.4 | 6.4 | 10.4 | 0.0 | 0.3 | 1.7 | 0.1 | 0.0 | 0.0 | - | - |
| 2020 | 0.3 | 7.5 | 6.7 | - | 0.2 | 0.0 | 0.4 | 0.0 | 0.0 | 0.8 | 1.8 |
| 2025 | 0.2 | 6.9 | 0.8 | - | 0.1 | - | 0.0 | 0.0 | 0.0 | - | 1.6 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-19.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella hutchinsifolia[a] (desert pale gilia) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Castilleja linariifolia (Wyoming Indian paintbrush) | Caulanthus crassicaulis[a] (thickstem wild cabbage) | Chamaesyce (sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) | Hedysarum boreale (Utah sweetvetch) | Helianthus annuus[a] (common sunflower) | Lactuca serriola[ai] (prickly lettuce) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | 5 | 2 | 92 | 52 | - | - | 15 | 5 | - | - | 9 | 109 | - | - | - | 1 | 9 |
| 2005 | - | 1 | 51 | 41 | - | - | 18 | 18 | - | - | 6 | 28 | 5 | - | - | - | 4 |
| 2010 | 5 | - | 40 | 24 | 7 | - | 2 | 27 | - | 11 | 5 | - | 13 | - | - | - | - |
| 2015 | 4 | 2 | - | 1 | 4 | 4 | - | - | 1 | 9 | 1 | 49 | - | - | 48 | - | - |
| 2020 | - | 11 | - | 11 | - | 1 | - | 1 | 0 | - | 12 | - | - | 4 | 29 | - | 8 |
| 2025 | - | 2 | - | 11 | - | 3 | - | - | - | - | 4 | 16 | - | - | 15 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | 0.0 | 0.0 | 2.5 | 0.6 | - | - | 0.2 | 0.0 | - | - | 0.1 | 2.3 | - | - | - | 0.0 | 0.1 |
| 2005 | - | 0.0 | 2.2 | 1.3 | - | - | 0.7 | 0.2 | - | - | 0.1 | 0.3 | 0.0 | - | - | - | 0.2 |
| 2010 | 0.0 | - | 0.8 | 0.5 | 0.3 | - | 0.0 | 0.2 | - | 0.0 | 0.0 | - | 0.0 | - | - | - | - |
| 2015 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.6 | - | - | 1.5 | - | - |
| 2020 | - | 0.1 | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | - | 0.1 | - | - | 0.0 | 0.8 | - | 0.0 |
| 2025 | - | 0.0 | - | 0.1 | - | 0.0 | - | - | - | - | 0.1 | 0.0 | - | - | 0.1 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Medicago sativa[i] (alfalfa) | Melilotus officinalis[i] (sweetclover) | Penstemon (beardtongue) | Penstemon pachyphyllus (thickleaf beardtongue) | Penstemon palmeri (Palmer's penstemon) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Plantago patagonica[a] (woolly plantain) | Sanguisorba minor[i] (small burnet) | Silene drummondii (Drummond's campion) | Sisymbrium altissimum[ai] (tall tumblemustard) | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1997 | - | 20 | - | 3 | 2 | - | - | 34 | - | 2 | - | 19 | - | - | - | 3 |
| 2005 | 15 | - | 9 | 6 | - | - | - | 20 | 1 | - | - | - | - | - | - | 1 |
| 2010 | 61 | - | 13 | - | - | 20 | - | 19 | - | 4 | 2 | - | 2 | - | 5 | 2 |
| 2015 | 32 | - | 2 | - | - | - | 4 | 8 | - | - | - | - | - | - | - | - |
| 2020 | 27 | - | 8 | - | - | - | 26 | - | 1 | 2 | - | - | - | - | 2 | - |
| 2025 | 14 | - | 1 | - | - | - | 6 | - | - | - | - | - | - | 1 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1997 | - | 0.1 | - | 0.0 | 0.0 | - | - | 0.6 | - | 0.0 | - | 0.5 | - | - | - | 0.0 |
| 2005 | 0.1 | - | 0.1 | 0.1 | - | - | - | 1.0 | 0.0 | - | - | - | - | - | - | 0.0 |
| 2010 | 0.3 | - | 0.2 | - | - | 0.4 | - | 0.3 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 |
| 2015 | 0.2 | - | 0.0 | - | - | - | 0.0 | 0.1 | - | - | - | - | - | - | - | - |
| 2020 | 0.1 | - | 0.0 | - | - | - | 0.2 | - | 0.0 | 0.0 | - | - | - | - | 0.0 | - |
| 2025 | 0.0 | - | 0.0 | - | - | - | 0.0 | - | - | - | - | - | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-19.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Purshia stansburiana[p] (Stansbury cliffrose) | Purshia tridentata[p] (antelope bitterbrush) | Symphoricarpos oreophilus[p] (mountain snowberry) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 8.6 | 0.7 | 0.5 | - | - | 3.3 | - | 0.2 | 0.5 | 0.9 | - |
| 2010 | - | 11.9 | 0.5 | 0.4 | - | 0 | 4.3 | 0.2 | 0.8 | 2.3 | 0.6 | - |
| 2015 | - | 13.7 | 1.7 | 1.3 | - | - | 0.5 | 0.1 | - | 1.8 | - | - |
| 2020 | - | 14.6 | 1 | 1.8 | - | - | 1.1 | - | - | 1.8 | 1.1 | - |
| 2025 | - | 21.9 | - | 1.3 | - | 0.1 | 0.8 | - | 0.8 | 0.2 | 2.6 | - |
| year | Quadrat Cover (%) | | | | | | | | | | | |
| 1997 | - | 1.6 | 0.6 | 0.2 | - | - | 2.0 | - | 0.0 | - | 0.4 | - |
| 2005 | - | 7.4 | 0.1 | 0.8 | - | - | 3.7 | 0.2 | 0.3 | 1.0 | 0.2 | - |
| 2010 | - | 6.8 | 1.1 | 0.1 | - | 0.1 | 2.8 | 0.0 | 0.6 | 0.4 | 0.8 | 0.0 |
| 2015 | - | 12.1 | 1.4 | 0.8 | 0.0 | 0.0 | 0.4 | 0.1 | - | 1.0 | - | - |
| 2020 | - | 14.2 | 0.9 | 1.2 | 0.0 | 0.0 | 1.0 | 0.1 | - | 0.5 | 1.0 | - |
| 2025 | 0.4 | 19.4 | 1.0 | 0.6 | - | 0.0 | 1.3 | 0.0 | 0.6 | 0.1 | 1.3 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-19.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 55/58 |
| 2010 | - | - | - | - | - | - | - | - | 48/67 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 45/69 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1997 | 1720 | 20 | 7 | 91 | 2 | 7 | 0 | 1 | 24/47 |
| 2005 | 2940 | 120 | 20 | 78 | 2 | 16 | 13 | 0 | 45/74 |
| 2010 | 4440 | 1340 | 39 | 60 | 1 | 12 | 5 | 1 | 28/56 |
| 2015 | 2920 | 380 | 34 | 64 | 1 | 50 | 16 | 4 | 40/60 |
| 2020 | 5980 | 80 | 13 | 81 | 5 | 10 | 0 | 5 | 35/67 |
| 2025 | 6260 | 60 | 6 | 88 | 6 | 38 | 14 | 9 | - / - |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 120 | - | 17 | 83 | 0 | 33 | 0 | 0 | 44/71 |
| 2010 | 300 | - | 0 | 93 | 7 | 27 | 53 | 7 | 45/85 |
| 2015 | 1740 | 60 | 41 | 59 | 0 | 9 | 64 | 0 | 43/76 |
| 2020 | 1020 | - | 26 | 73 | 2 | 22 | 0 | 2 | 47/74 |
| 2025 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 66/58 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1997 | 320 | - | 56 | 44 | 0 | 19 | 19 | 0 | 82/113 |
| 2005 | 240 | - | 33 | 25 | 42 | 0 | 58 | 33 | 74/75 |
| 2010 | 120 | - | 17 | 83 | 0 | 33 | 33 | 0 | 69/78 |
| 2015 | 60 | - | 33 | 67 | 0 | 100 | 0 | 0 | 77/87 |
| 2020 | 160 | - | 13 | 88 | 0 | 38 | 38 | 0 | 95/110 |
| 2025 | 120 | - | 0 | 100 | 0 | 17 | 50 | 0 | - / - |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 56/116 |
| 2015 | - | - | - | - | - | - | - | - | 65/119 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Echinocereus coccineus -- (scarlet hedgehog cactus) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 6/8 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 20/31 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 69/92 |
| 2010 | - | - | - | - | - | - | - | - | 62/76 |
| 2015 | - | - | - | - | - | - | - | - | 88/135 |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 69/113 |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 31/50 |
| 2010 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | 14/17 |
| 2015 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 160 | - | 38 | 63 | 0 | 0 | 0 | 0 | 15/17 |
| 2025 | 300 | - | 7 | 93 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1997 | 100 | - | 60 | 40 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 200 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 200 | - | 60 | 40 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 80 | 20 | 100 | 0 | 0 | 0 | 0 | 25 | - / - |
| 2020 | 120 | - | 83 | 17 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 100 | 20 | 20 | 80 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/54 |
| 2005 | 100 | - | 0 | 80 | 20 | 0 | 0 | 20 | 10/34 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/32 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 0 | 25 | 8/32 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/29 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1997 | 200 | 20 | 90 | 10 | 0 | 0 | 0 | 10 | - / - |
| 2005 | 180 | - | 89 | 11 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 200 | - | 90 | 10 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 80 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 120 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Purshia stansburiana[p] -- (Stansbury cliffrose) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | 102/219 |
| 2005 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 91/104 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 87/112 |
| 2015 | 120 | - | 0 | 100 | 0 | 0 | 100 | 0 | 93/141 |
| 2020 | 60 | - | 33 | 33 | 33 | 33 | 67 | 33 | 95/112 |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1997 | 100 | - | 20 | 60 | 20 | 20 | 0 | 20 | - / - |
| 2005 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 70/104 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 104/174 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 91/180 |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 40 | 0 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 11/7 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

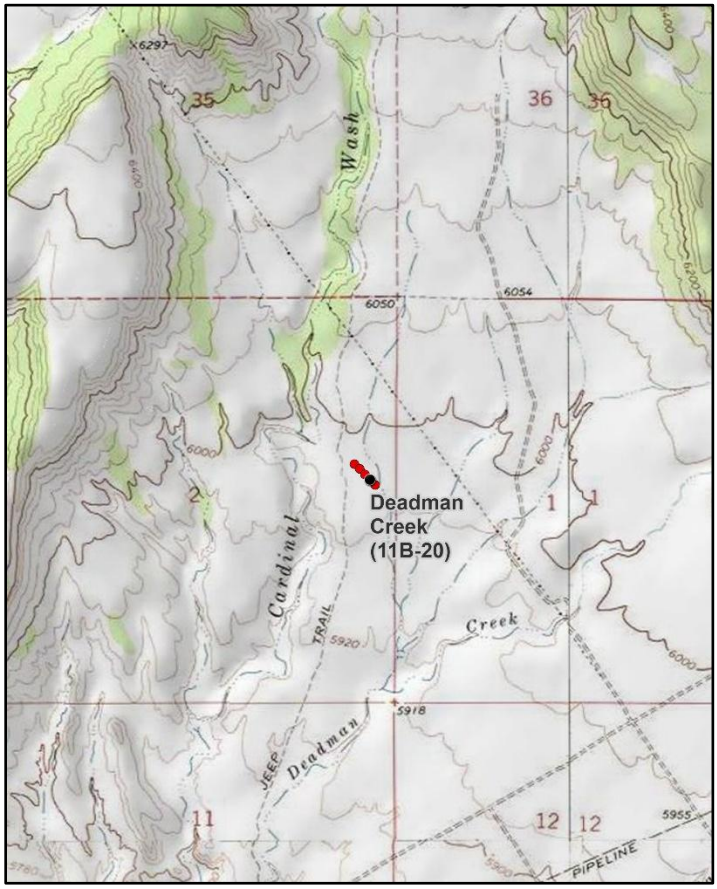
**Table 11B-19.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

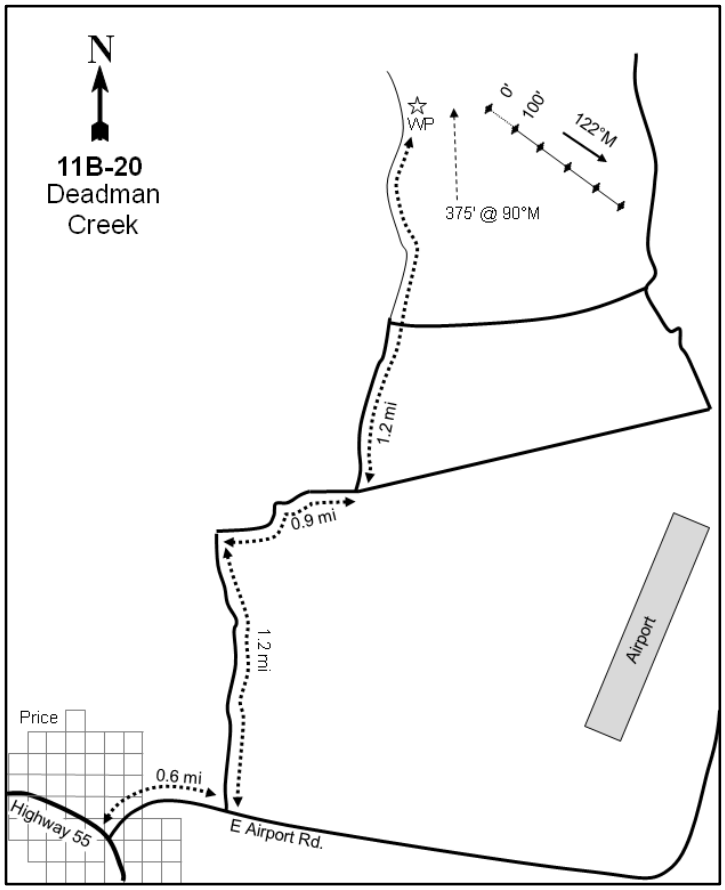
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2005 | 84 | 11 | 26 | 63 | - | - | 13.7 |
| 2010 | 44 | - | 43 | 50 | 7 | - | 9.4 |
| 2015 | 53 | - | 57 | 7 | 21 | 14 | 4.6 |
| 2020 | 39 | - | 93 | 7 | - | - | 10.4 |
| 2025 | 59 | - | 76 | 24 | - | - | 10.3 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2005 | 122 | 5 | 75 | 20 | - | - | 4.3 |
| 2010 | 80 | - | 93 | 7 | - | - | 4.7 |
| 2015 | 36 | - | 100 | - | - | - | 2.4 |
| 2020 | 55 | 18 | 82 | - | - | - | 3.1 |
| 2025 | 49 | 6 | 82 | 12 | - | - | 4.6 |

**Table 11B-19.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 3.7 | 0.0 | 0.0 | 1.9 | 0.0 | 9.3 | 0.0 | **14.9** | Very Poor |
| 2005 | 14.5 | 14.0 | 8.8 | 19.2 | 0.0 | 10.0 | 0.0 | **66.5** | Fair-Good |
| 2010 | 20.5 | 14.7 | 14.9 | 12.4 | -0.3 | 5.0 | 0.0 | **67.2** | Good |
| 2015 | 23.9 | 14.8 | 15.0 | 18.0 | -7.8 | 3.5 | 0.0 | **67.4** | Good |
| 2020 | 26.6 | 12.8 | 7.5 | 22.0 | -5.1 | 2.5 | 0.0 | **66.3** | Fair-Good |
| 2025 | 30.0 | 13.2 | 2.6 | 17.5 | -0.6 | 0.5 | 0.0 | **63.2** | Fair-Good |
| 1997 | 3.7 | 0.0 | 0.0 | 1.9 | 0.0 | 9.3 | 0.0 | **14.9** | Very Poor |

# DEADMAN CREEK - STUDY NO. 11B-20




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Helper SE; Township 14S, Range 10E, Section 02 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 520593 East 4387621 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 174 |
| Transect Bearing | 122° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Highway 55 in Price, travel on East Airport Road for 0.6 miles, then turn left onto Deadman Creek Road and continue for 1.2 miles. Upon reaching South Airport Flats Road, turn right and drive 0.9 miles. At the fork, stay left to continue on South Airport Flats Road and drive for 1.2 miles. The 0-foot stake is about 375 feet east of the right side of the road and is marked with browse tag #174.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | HAYES WASH |
| Elevation | 5,984ft (1,824m) |
| Aspect | East |
| Slope | 3-4% |
| Sample Dates | 05/13/2015, 08/05/2020, 05/12/2025 |

## Wildlife Habitat and Vegetation History

**Table 11B-20.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Pronghorn | crucial | year-long |

**Table 11B-20.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2015 | Wyoming Big Sagebrush | Early Phase I |
| 2020 | Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush | Early Phase I |

## Site Notes

This site replaces the Airport (11B-03) study site which was suspended because of its proximity to the airport.

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034XY212UT |
| States and Transitions | 2015-2025 - Juniper Encroachment State: Community Phase 3.1 |

Since the study was established in 2015, the plant community on this site has remained dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (Table 11B-20.12). The herbaceous understory has remained depauperate in both species richness and abundance with native annual forbs providing nearly all of the cover (Table 11B-20.7, Table 11B-20.11). Although rare, Utah juniper (*Juniperus osteosperma*) has been present on this site and has the potential to increase over time (Table 11B-20.12, Table 11B-20.14). However, the site has been considered to be within Early Phase I of woodland succession since study establishment (Table 11B-20.4), and further tree encroachment is likely not an immediate concern.

Mule deer winter range conditions have remained fair since 2015. Deer winter range is limited by a lack of preferred browse recruitment, a lack of perennial grass and forb cover, and the presence of cheatgrass (*Bromus tectorum*) (Table 11B-20.7, Table 11B-20.13, Table 11B-20.15). Mule deer presence has remained high over the sample period (Table 11B-20.9). Utilization of Wyoming big sagebrush has transitioned from heavy in 2015 to more moderate in 2025 (Table 11B-20.13). On-site observations in 2025 noted little to no utilization on herbaceous species.

## Trend Summary Tables

**Table 11B-20.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2015 | 18.4 | 0.3 | 0.4 | 21.0 | 0.1 | 0.1 |
| 2020 | 19.0 | 2.0 | - | 22.7 | 2.1 | - |
| 2025 | 24.4 | 1.6 | 0.1 | 24.0 | 0.8 | 0.2 |

**Table 11B-20.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2015 | 4 | 4 | 236 | 4 | 0.0 | 0.0 | 3.5 | 0.0 |
| 2020 | 16 | - | 219 | - | 0.0 | - | 3.2 | - |
| 2025 | 107 | 10 | 110 | - | 0.3 | 0.1 | 0.3 | - |

**Table 11B-20.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2015 | 62.9 | 5.9 | 26.0 | 0.9 | 0.7 | 23.3 |
| 2020 | 47.8 | 8.0 | 35.4 | 1.9 | 1.6 | 22.2 |
| 2025 | 51.4 | 10.5 | 29.2 | 2.5 | 1.3 | 26.9 |

**Table 11B-20.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|
| | Quadrat Frequency | | |
| 2015 | 28 | - | 7 |
| 2020 | 40 | - | 27 |
| 2025 | 61 | - | 18 |
| Year | Days Use Per Acre (ha) | | |
| 2015 | 51.6 (127.5) | 4.0 (9.9) | - |
| 2020 | 97.9 (241.7) | - | - |
| 2025 | 54.9 (135.7) | - | - |

**Table 11B-20.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|
| year | Nested Frequency | | |
| 2015 | - | 4 | 4 |
| 2020 | - | - | 16 |
| 2025 | 1 | 10 | 106 |
| year | Average Cover (%) | | |
| 2015 | - | 0.0 | 0.0 |
| 2020 | - | - | 0.0 |
| 2025 | 0.0 | 0.1 | 0.3 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-20.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Cryptantha gracilis[a] (narrowstem cryptantha) | Descurainia pinnata[a] (western tansymustard) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum[a] (mountain pepperweed) | Sphaeralcea coccinea (scarlet globemallow) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 2015 | 27 | 206 | 99 | 6 | 4 |
| 2020 | 3 | 152 | 104 | 13 | - |
| 2025 | 2 | 63 | 77 | 2 | - |
| year | Average Cover (%) | | | | |
| 2015 | 0.1 | 3.1 | 0.3 | 0.0 | 0.0 |
| 2020 | 0.1 | 2.6 | 0.3 | 0.1 | - |
| 2025 | 0.0 | 0.1 | 0.2 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-20.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (pricklypear) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 2015 | 21 | 0.1 | 0.1 | - |
| 2020 | 22.7 | 2.1 | - | - |
| 2025 | 24 | 0.8 | 0.2 | - |
| year | Quadrat Cover (%) | | | |
| 2015 | 18.4 | 0.2 | 0.4 | 0.0 |
| 2020 | 19.0 | 2.0 | - | - |
| 2025 | 24.4 | 1.6 | 0.1 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-20.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2015 | 5940 | - | 3 | 59 | 38 | 9 | 82 | 21 | 56/80 |
| 2020 | 4840 | - | 3 | 54 | 43 | 16 | 28 | 60 | 54/70 |
| 2025 | 6660 | 180 | 2 | 73 | 26 | 47 | 11 | 26 | - / - |
| Echinocereus -- (hedgehog cactus) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 13/51 |
| 2020 | - | - | - | - | - | - | - | - | 19/38 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2015 | 680 | 300 | 65 | 35 | 0 | 0 | 0 | 0 | 14/16 |
| 2020 | 4240 | - | 29 | 70 | 1 | 0 | 0 | 3 | 21/21 |
| 2025 | 2900 | - | 15 | 74 | 11 | 3 | 0 | 12 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/31 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/13 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

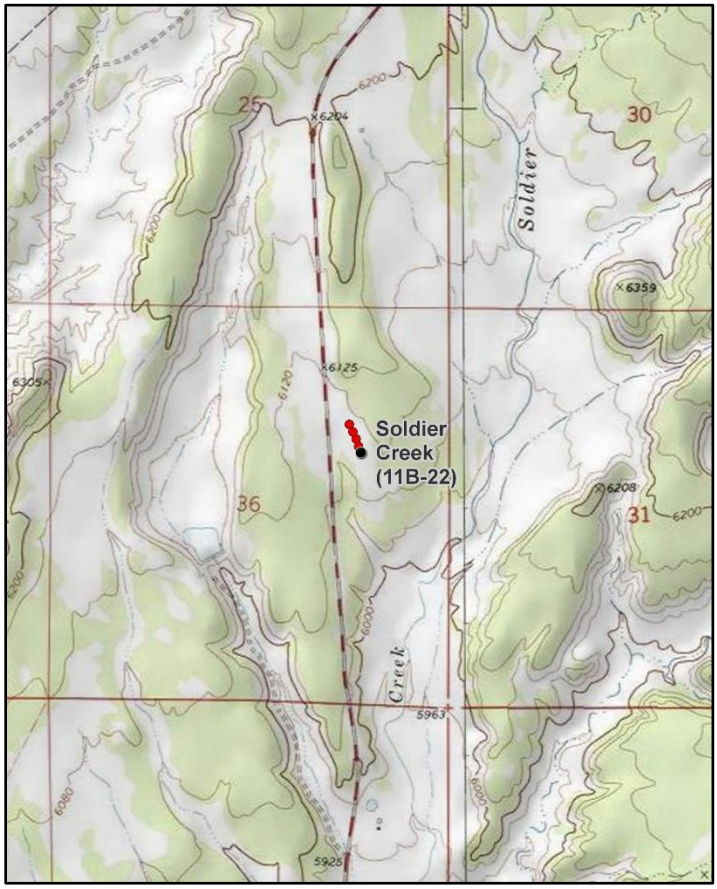
**Table 11B-20.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

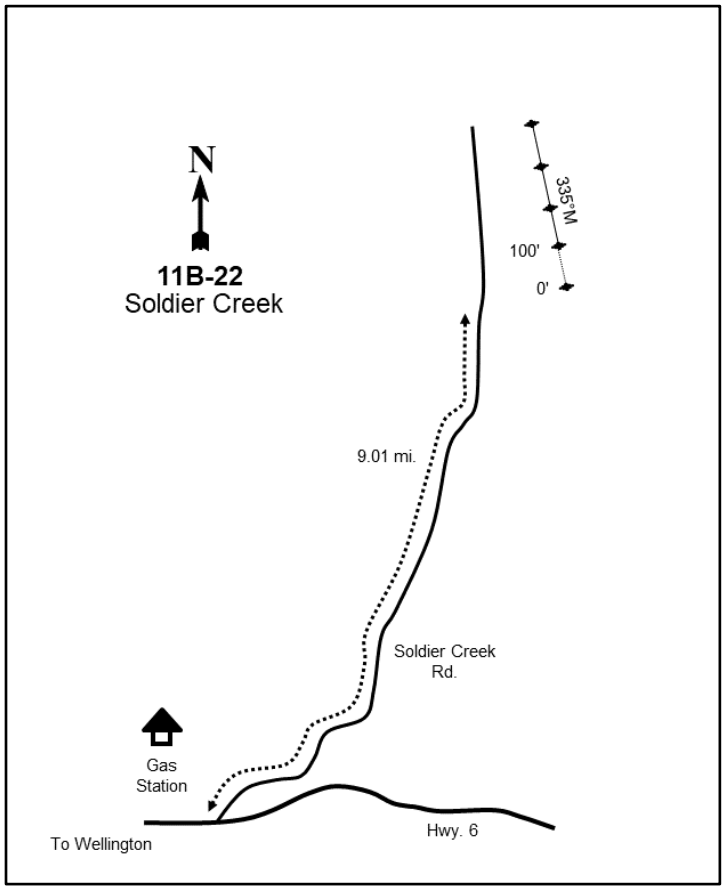
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 5 | - | 25 | 75 | - | - | 14.8 |
| 2020 | 6 | - | 17 | 83 | - | - | 16.3 |
| 2025 | 6 | - | 40 | 20 | 40 | - | 12.6 |

**Table 13A-01.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2015 | 26.3 | 3.6 | 1.7 | 0.0 | 0.0 | 0.1 | 0.0 | **31.7** | Fair |
| 2020 | 28.4 | 2.1 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | **32.0** | Fair |
| 2025 | 30.0 | 7.4 | 0.8 | 0.3 | -0.2 | 0.0 | 0.0 | **38.3** | Fair |

# SOLDIER CREEK - STUDY NO. 11B-22




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Deadman Canyon SE; Township 13S, Range 11E, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 531700 East 4389420 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 566 |
| Transect Bearing | 335° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the gas station located at the intersection of Highway 6 and Soldier Creek Road, turn north onto Soldier Creek Road and drive 9.1 miles to dirt road on the right. Drive 0.1 miles to the site location and park. The site is just north of the dirt road and there is no witness post.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | SITLA |
| Allotment | SOLDIERS CANYON |
| Elevation | 6,080ft (1,853m) |
| Aspect | West |
| Slope | 5-10% |
| Sample Dates | 07/01/2020, 05/14/2025 |

## ildlife Habitat and Vegetation History

**Table 11B-22.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | year-long |
| Pronghorn | crucial | year-long |

**Table 11B-22.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2020 | Mountain Big Sagebrush | Phase I |
| 2025 | Mountain Big Sagebrush | Phase I |

## Site Notes

No Notes

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034XY212UT |
| States and Transitions | 2020-2025 - Juniper Encroachment State: Community Phase 3.1 |

The plant community on this site has remained dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) since study establishment in 2020 (Table 11B-22.12). The herbaceous understory has not been overly abundant with native perennial grasses providing the majority of the cover (Table 11B-22.7, Table 11B-22.10, Table 11B-22.11). Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have remained scattered across the site, placing it in Phase I of woodland succession (Table 11B-22.4, Table 11B-22.12, Table 11B-22.14). Without a tree-removing disturbance and with enough time, it is likely that pinyon and juniper will continue to increase and become the dominant vegetation component.

Mule deer winter range conditions have remained fair since 2020. Deer winter range condition has been limited by a lack of preferred browse recruitment, a lack of perennial grass and forb cover, and the presence of cheatgrass (Table 11B-22.7, Table 11B-22.13, Table 11B-22.15). Mule deer presence has been very high throughout the sample period (Table 11B-22.9). Utilization of mountain big sagebrush has transitioned from moderate in 2020 to heavy in 2025. More specifically, combined moderate and heavy utilization totaled 99% of the sagebrush population during the most recent sample year (Table 11B-22.13). On-site observations in 2025 noted little to no utilization on herbaceous species.

## Trend Summary Tables

**Table 11B-22.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2020 | 18.8 | 5.8 | 1.8 | 19.8 | 5.6 | 6.9 |
| 2025 | 17.7 | 3.5 | 3.7 | 21.0 | 3.5 | 6.5 |

**Table 11B-22.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2020 | 28 | 51 | 59 | 11 | 0.3 | 1.8 | 0.3 | 0.2 |
| 2025 | 106 | 74 | 164 | 5 | 0.5 | 4.3 | 0.8 | 0.0 |

**Table 11B-22.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2020 | 39.3 | 0.4 | 47.3 | 3.7 | 1.6 | 28.2 |
| 2025 | 39.3 | 0.1 | 49.5 | 4.7 | 0.5 | 29.1 |

**Table 11B-22.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2020 | - | 72 | - | 20 |
| 2025 | - | 80 | 1 | 31 |
| Year | Days Use Per Acre (ha) | | | |
| 2020 | 0.7 (1.8) | 148.1 (365.8) | 1.3 (3.3) | - |
| 2025 | 0.7 (1.8) | 130.0 (321.1) | - | - |

**Table 11B-22.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Pseudoroegneria spicata (bluebunch wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | |
| 2020 | - | 13 | 28 | 2 | 6 | 30 | 6 | - |
| 2025 | 5 | 29 | 97 | 7 | 29 | 11 | - | 16 |
| year | Average Cover (%) | | | | | | | |
| 2020 | - | 0.3 | 0.3 | 0.0 | 0.5 | 0.9 | 0.2 | - |
| 2025 | 0.2 | 2.4 | 0.4 | 0.0 | 1.2 | 0.6 | - | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11B-22.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Chenopodium fremontii[a] (Fremont's goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum cernuum[a] (nodding buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 2020 | 6 | 3 | 9 | 6 | 7 | 29 | 3 | 8 | 3 | - | 2 |
| 2025 | 2 | - | - | 55 | - | 152 | 1 | 3 | - | 2 | - |
| year | Average Cover (%) | | | | | | | | | | |
| 2020 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.2 | 0.0 | - | 0.0 |
| 2025 | 0.0 | - | - | 0.1 | - | 0.7 | 0.0 | 0.0 | - | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11B-22.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 2020 | 19.3 | 0.5 | 5.5 | 4.2 | 0.1 | 2.7 |
| 2025 | 20.6 | 0.4 | 2.8 | 3.7 | 0.7 | 2.8 |
| year | Quadrat Cover (%) | | | | | |
| 2020 | 18.0 | 0.8 | 5.7 | 0.8 | 0.1 | 1.0 |
| 2025 | 16.9 | 0.8 | 3.0 | 2.6 | 0.5 | 1.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11B-22.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2020 | 4760 | 20 | 13 | 58 | 29 | 41 | 9 | 28 | 51/72 |
| 2025 | 4640 | 40 | 1 | 71 | 28 | 45 | 54 | 27 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 126/207 |
| 2025 | 60 | - | 0 | 67 | 33 | 33 | 0 | 33 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2020 | 17100 | 60 | 15 | 85 | 0 | 0 | 0 | 1 | 21/20 |
| 2025 | 15380 | 80 | 3 | 95 | 2 | 3 | 0 | 2 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2020 | 80 | - | 0 | 50 | 50 | 0 | 0 | 50 | 13/37 |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

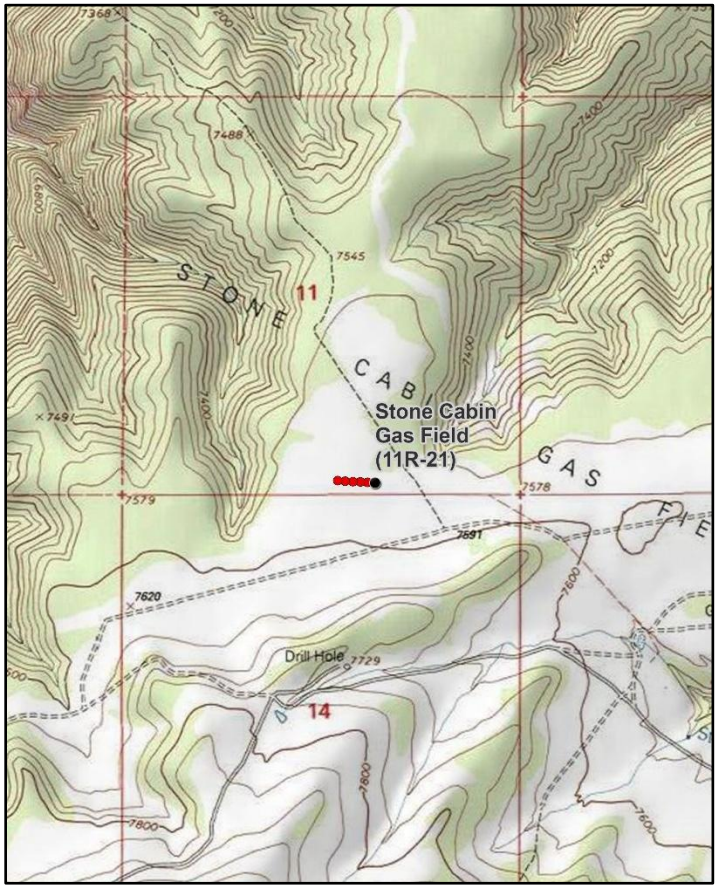
**Table 11B-22.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

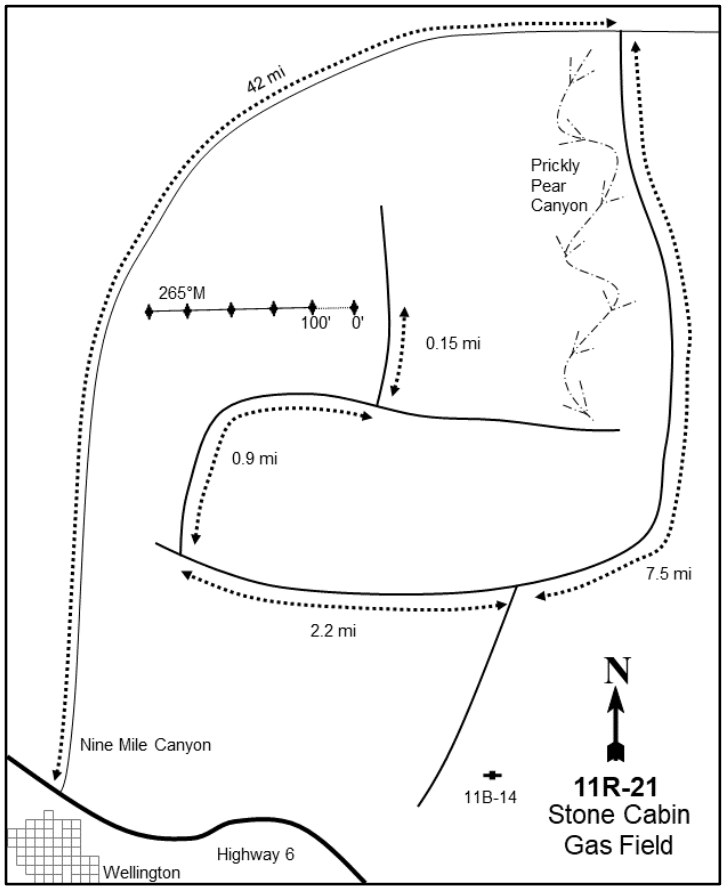
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 39 | - | 11 | 50 | 28 | 11 | 20.6 |
| 2025 | 39 | - | 6 | 50 | 33 | 11 | 10.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2020 | 17 | - | 33 | 67 | - | - | 7.7 |
| 2025 | 7 | 50 | 50 | - | - | - | 3.5 |

**Table 11B-22.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2020 | 24.8 | 5.6 | 6.1 | 3.7 | -0.2 | 0.5 | 0.0 | **40.5** | Fair |
| 2025 | 26.3 | 6.5 | 0.4 | 8.6 | -0.4 | 0.0 | 0.0 | **41.4** | Fair |

# STONE CABIN GAS FIELD - STUDY NO. 11R-21




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Currant Canyon SW; Township 12S, Range 14E, Section 11 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 558870 East 4403615 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 239 |
| Transect Bearing | 265° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

If traveling west from the Cold Spring WMA or Dry Canyon along Nine Mile Canyon Road, turn left (south) onto Prickly Pear Canyon Road and travel for 7.5 miles to the intersection that turns to the Prickly Pear site (11B-14). Continue straight for 2.2 miles while passing the gas facility to Harmon Canyon Road and Stone Cabin Gas Field Road. Turn right (north) onto Stone Cabin Gas Field Road and travel for 0.9 miles to another intersection; turn left (north). Travel for 0.15 miles or until the GPS indicates that the truck is close to the 0-foot baseline stake. Walk approximately 89 feet to the 0-foot stake.

***If coming from Wellington along Nine Mile Canyon, then the site should be accessed from Harmon Canyon.***

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | STONE CABIN |
| Elevation | 7,600ft (2,316m) |
| Aspect | Southeast |
| lope | 3% |
| Sample Dates | 08/03/2021, 07/22/2025 |

**Table 11R-21.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Chaining - Chain Unknown | - | - | 1960s | - |
| Hand Crew - Lop and Scatter | Interplanetary Airstrip Lop and Scatter | 2163 | October-November 2011 | 1295 |
| Hand Crew - Lop and Scatter | - | - | 2023 | - |

## Wildlife Habitat and Vegetation History

**Table 11R-21.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | substantial | year-long |
| Pronghorn | substantial | year-long |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 11R-21.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2021 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 11R-21.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.2 | 46.3 | 36.3 | 17.4 | 2.3 | - | - | 0.4 | 08/03/2021 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R048AY405UT |
| States and Transitions | 2021-2025 - Mountain Big Sagebrush Super-Dominance State: Community Phase 3.1 |

Since study establishment in 2021, the vegetation on this site has existed as a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*)-dominated shrubland community (Photos, Table 11R-21.12). The sagebrush population has remained decadent with the majority of the plants displaying poor vigor (Table 11R-21.13), which can likely be attributed to prolonged drought. In 2021, the herbaceous understory was comprised mostly of perennial grasses with crested wheatgrass (*Agropyron cristatum*) and thickspike wheatgrass (*Elymus lanceolatus*) as the dominant species, but saline wildrye (*Leymus salinus*) increased in abundance and cover in 2025 (Table 11R-21.10). Forbs have remained rare overall and have contributed little to community diversity. However, longleaf phlox (*Phlox longifolia*) and longstalk springparsley (*Cymopterus longipes*) also increased in abundance and cover in 2025 (Table 11R-21.11). Without a major disturbance, the site is expected to remain in this or a similar sagebrush-dominated state in the future. Despite a 2011 lop and scatter treatment (Table 11R-21.1), point-quarter density data indicates that Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have been observed in the area (Table 11R-21.14). However, the site has been considered to be within Early Phase I of woodland succession since 2021 (Table 11R-21.4), suggesting that infilling may not pose an immediate threat to the plant community.

Condition of deer winter range on this site has varied between poor and fair since 2021; winter range condition was poor in 2025. The main factors negatively affecting winter range condition include reduced preferred browse recruitment, and reduced perennial grass and forb cover (Table 11R-21.7, Table 11R-21.13, Table 11R-21.15). Pellet transect data indicates that deer and elk presence has remained low since 2021 (Photos, Table 11R-21.9). During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife Migration Initiative). On-site observations for 2025 noted little to no utilization on herbaceous species. It was also noted that herbaceous species were normal and vigorous in 2025, but sagebrush was likely drought-affected as evidenced by reduced primary growth.

## Trend Summary Tables

**Table 11R-21.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2021 | 15.7 | 0.1 | 0.1 | 21.8 | 0.1 | - |
| 2025 | 16.6 | 0.2 | 0.2 | 19.8 | 0.1 | - |

**Table 11R-21.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2021 | 4 | 315 | 6 | 107 | 0.0 | 11.5 | 0.0 | 0.6 |
| 2025 | - | 279 | 3 | 178 | - | 9.9 | 0.0 | 1.6 |

**Table 11R-21.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2021 | 61.0 | 0.5 | 23.6 | 0.8 | 0.6 | 24.4 |
| 2025 | 55.1 | 0.9 | 34.3 | 0.8 | 1.1 | 26.0 |

**Table 11R-21.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 2021 | 5 | - | 28 | - | 30 |
| 2025 | 4 | - | 14 | 1 | 28 |
| Year | Days Use Per Acre (ha) | | | | |
| 2021 | 6.5 (16.1) | 8.7 (21.5)* | 13.4 (33.1) | - | - |
| 2025 | 12.3 (30.5) | - | 18.7 (46.3) | - | - |

*Pellets per acre (ha)

**Table 11R-21.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Carex geyeri (Geyer's sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 2021 | 38 | 156 | 4 | 17 | 3 | 177 | 5 | 11 | 9 | 10 | 44 |
| 2025 | - | 124 | - | - | 16 | 126 | 27 | - | 74 | 3 | 61 |
| year | Average Cover (%) | | | | | | | | | | |
| 2021 | 0.5 | 6.6 | 0.0 | 0.1 | 0.0 | 2.6 | 0.2 | 0.1 | 0.2 | 0.6 | 0.6 |
| 2025 | - | 5.1 | - | - | 0.3 | 1.3 | 0.3 | - | 1.8 | 0.2 | 1.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 11R-21.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Antennaria dimorpha (low pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Castilleja angustifolia (northwestern Indian paintbrush) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Erigeron eatonii (Eaton's fleabane) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera gracilis[a] (slender goldenweed) | Packera multilobata (lobeleaf groundsel) | Penstemon comarrhenus (dusty beardtongue) | Phlox longifolia (longleaf phlox) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 2021 | - | - | 6 | 4 | - | - | 5 | 8 | 10 | 1 | 0 | 4 | 1 | 69 | 19 |
| 2025 | 1 | 3 | 3 | 14 | 4 | 7 | - | 77 | 5 | 4 | - | - | - | 112 | 21 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 2021 | - | - | 0.0 | 0.0 | - | - | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 |
| 2025 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.5 | 0.0 | 0.0 | - | - | - | 0.8 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 11R-21.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Pinus edulis[t] (twoneedle pinyon) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 2021 | - | 21.8 | - | - | 0.1 |
| 2025 | - | 19.8 | - | - | 0.1 |
| year | Quadrat Cover (%) | | | | |
| 2021 | 0.0 | 15.7 | 0.1 | 0.1 | 0.0 |
| 2025 | 0.0 | 16.6 | 0.2 | 0.2 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 11R-21.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2021 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2021 | 5020 | 140 | 13 | 41 | 46 | 11 | 12 | 51 | - / - |
| 2025 | 4660 | 60 | 4 | 42 | 54 | 14 | 52 | 55 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 2021 | 80 | - | 25 | 75 | 0 | 0 | 25 | 25 | - / - |
| 2025 | 100 | - | 0 | 60 | 40 | 20 | 0 | 40 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2021 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 2021 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 2021 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2021 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | - / - |
| 2025 | 60 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

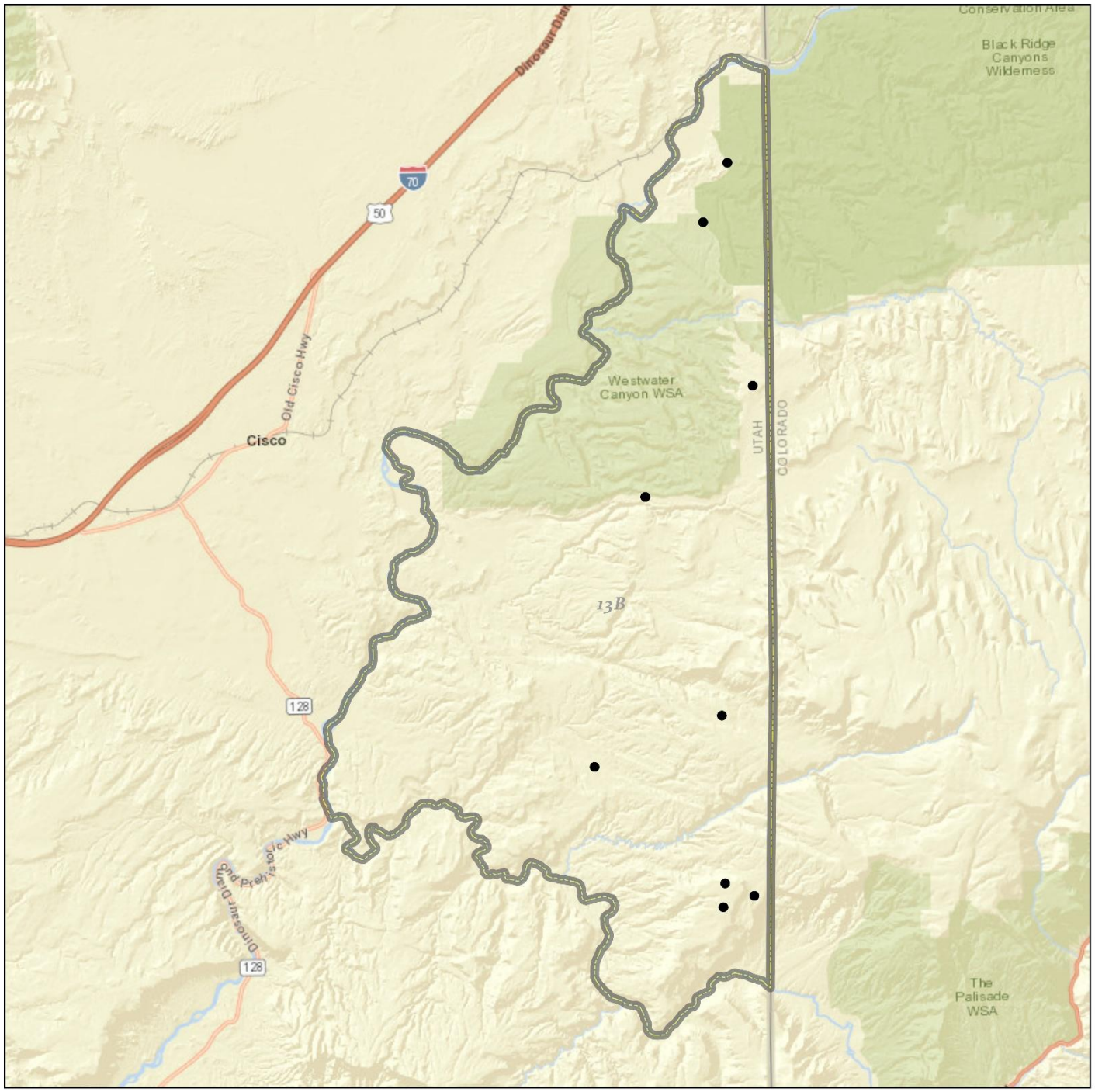
**Table 11R-21.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2021 | 9 | - | 100 | - | - | - | 3.0 |
| 2025 | 1 | 100 | - | - | - | - | 1.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2021 | 8 | 33 | 67 | - | - | - | 1.7 |
| 2025 | 7 | 33 | 67 | - | - | - | 1.3 |

**Table 11R-21.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2021 | 27.3 | 1.3 | 6.6 | 23.0 | 0.0 | 1.1 | 0.0 | **59.3** | Fair |
| 2025 | 24.8 | -1.2 | 2.2 | 19.8 | 0.0 | 3.3 | 0.0 | **48.9** | Poor |

# WILDLIFE MANAGEMENT UNIT 13B – DOLORES TRIANGLE

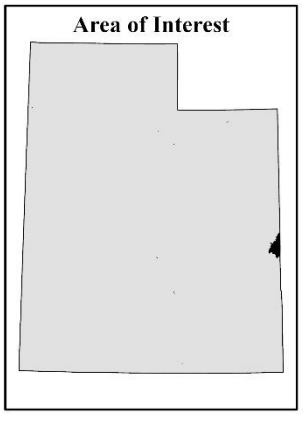



0 1.25 2.5 5 7.5 10 12.5 15 17.5 20 Miles

**Study Locations Project, Status**
RT, Active

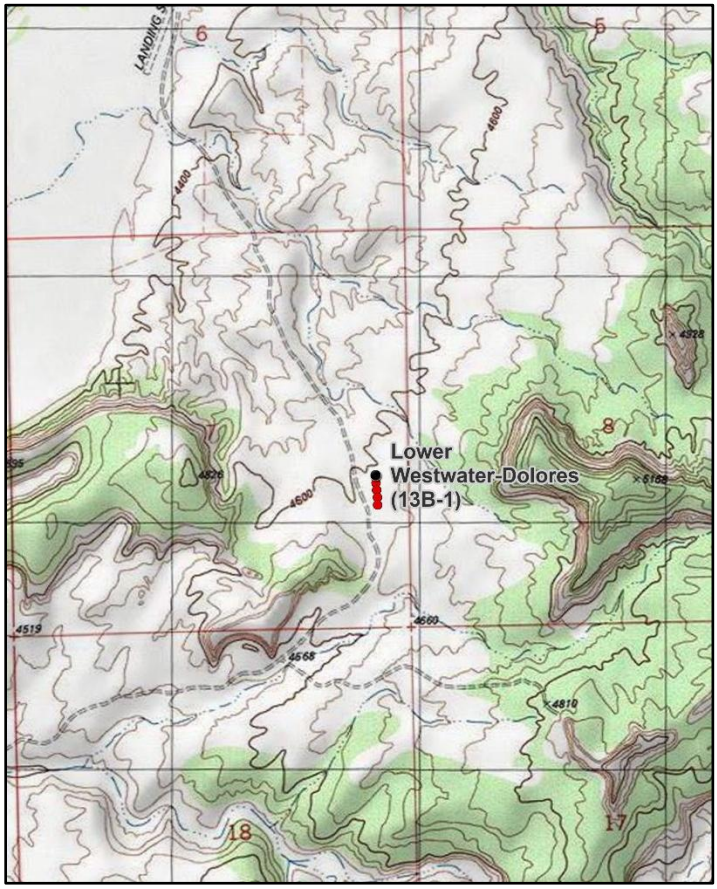
**Unit Boundary**
Unit - 13B

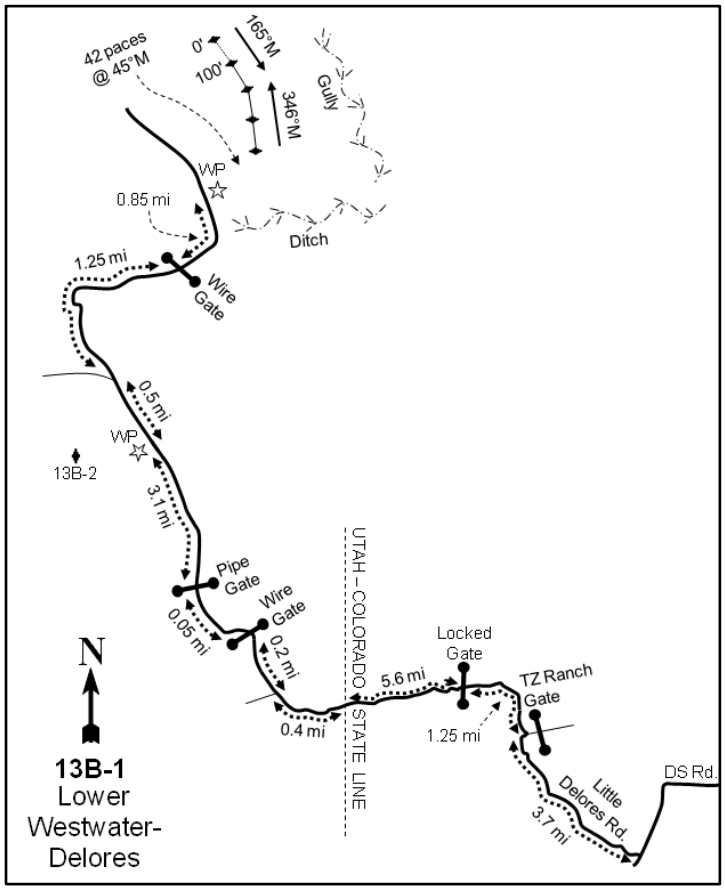
**Area of Interest**



Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# LOWER WESTWATER-DOLORES - STUDY NO. 13B-1




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Westwater NW; Township 20S, Range 26E, Section 07 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 666761 East 4327390 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 165° magnetic (Lines 3-4: 166° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of the DS Road and Little Delores Road west of Glade Park, Colorado, go down Little Delores Road 3.7 miles to the TZ Ranch gate. Turn left and go 1.25 miles along the fence to another gate (permission and key necessary to get through gates). Continue 5.6 miles to the state line. Go another 0.4 miles to a cabin. Turn right along the edge of a field and go 0.2 miles to a wire gate and another 0.1 miles to a pipe gate. Go 3.1 miles to transect 13B-02 (Upper Westwater-Dolores). Continue 0.5 miles to a fork near a sheep corral and keep right. Continue 1.3 miles to a wire gate, then another 0.9 miles to the witness post and a 2 ½-foot tall fencepost off of the right (east) side of the road on top of the road cut. From the witness post, walk 42 paces at 45 degrees magnetic to the 400-foot baseline stake.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | No data |
| Elevation | 4,600ft (1,402m) |
| Aspect | Northwest |
| Slope | 4-6% |
| Sample Dates | 06/08/1995, 05/24/2000, 05/25/2005, 05/26/2010, 05/20/2015, 05/19/2020, 05/20/2025 |

## Wildlife Habitat and Vegetation History

**Table 13B-01.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |

**Table 13B-01.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Basin Big Sagebrush/Annual Grass | No Encroachment |
| 1995 | Basin Big Sagebrush/Annual Grass | No Encroachment |
| 2000 | Basin Big Sagebrush/Annual Grass | No Encroachment |
| 2005 | Annual Grass-Weed | No Encroachment |
| 2010 | Annual Grass-Weed | No Encroachment |
| 2015 | Annual Grass-Weed | No Encroachment |
| 2020 | Annual Grass-Weed | No Encroachment |
| 2025 | Annual Grass-Weed | No Encroachment |

## Site Notes

In 2015, it was noted that any sagebrush (*Artemisia* spp.) left on the site was dying or had died due to drought and grazing.

## Soils

**Table 13B-01.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 8.2 | 71.0 | 16.4 | 12.6 | 0.0 | 3.9 | 118.4 | 0.1 | 05/24/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Sandy Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R035XY216UT |
| States and Transitions | 1986-2000 - Depleted Understory State: Community Phase 3.2<br>2005-2025 - State Undefined: Community Phase Undefined |

From study establishment in 1986 through 2000, this site was dominated by basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) (Pre-1992 Data). However, sagebrush cover began to decrease substantially as plants died (Table 13B-01.12). The herbaceous understory was not particularly abundant or diverse in 1986, and although cover increased over the following sample years, diversity remained low. Since site establishment, annual grasses have remained a dominant vegetation component with the introduced species cheatgrass (*Bromus tectorum*) as the main species (Photos, Table 13B-01.10). By 2005 nearly all of the sagebrush was dead, causing the site to transition to an annual grass and weedy annual forbs community type (Table 13B-01.7, Table 13B-01.11). The high abundance of cheatgrass places this site at an increased risk for wildfire.

Deer winter range condition on this site has remained very poor since 1995. Improvements to deer winter range could be achieved by increasing recruitment of young and overall cover in the preferred browse community. In addition, improvement could also come from diversifying and increasing the cover of perennial grasses and forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-01.6, Table 13B-01.7, Table 13B-01.13, Table 13B-01.15). Pellet group data suggests that deer presence has varied between low and high since 2000. Elk presence has remained low over the same period (Table 13B-01.9). On-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 13B-01.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 1.7 | - | - | - | - | - |
| 2000 | 2.4 | - | - | - | - | - |
| 2005 | 0.2 | - | - | - | - | - |
| 2010 | 0.2 | 0.0 | - | - | - | - |
| 2015 | - | - | - | - | - | - |
| 2020 | - | - | - | - | - | - |
| 2025 | - | - | - | - | - | - |

**Table 13B-01.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 480 | 124 | 364 | 62 | 12.4 | 2.0 | 3.0 | 0.5 |
| 2000 | 415 | 109 | 173 | 22 | 12.4 | 2.8 | 2.0 | 0.2 |
| 2005 | 440 | 77 | 375 | 36 | 27.9 | 1.4 | 12.4 | 0.9 |
| 2010 | 446 | 101 | 395 | 127 | 23.3 | 4.5 | 10.2 | 2.7 |
| 2015 | 408 | 198 | 450 | 38 | 7.8 | 5.3 | 17.2 | 0.5 |
| 2020 | 433 | 183 | 330 | 76 | 17.8 | 4.9 | 6.2 | 0.8 |
| 2025 | 453 | 114 | 307 | 66 | 18.8 | 3.8 | 5.4 | 0.7 |

**Table 13B-01.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 17.8 | 2.0 | 51.0 | - | - | 29.5 |
| 2000 | 38.3 | 12.1 | 34.5 | - | - | 22.7 |
| 2005 | 31.5 | 1.1 | 31.0 | - | - | 42.6 |
| 2010 | 30.0 | 0.9 | 39.5 | - | - | 46.5 |
| 2015 | 31.9 | 1.8 | 47.7 | - | - | 30.5 |
| 2020 | 40.8 | 8.3 | 40.9 | 0.1 | - | 32.7 |
| 2025 | 18.1 | 0.4 | 71.6 | 0.0 | - | 28.4 |

**Table 13B-01.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 3 | 31 | - | 12 |
| 2000 | 4 | 39 | - | 10 |
| 2005 | 11 | 33 | 3 | 14 |
| 2010 | 4 | 12 | 1 | 17 |
| 2015 | 13 | 8 | - | 5 |
| 2020 | 14 | 13 | - | 4 |
| 2025 | 4 | 21 | 3 | - |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 15.3 (37.7) | 79.1 (195.3) | 12.1 (29.8) | - |
| 2005 | 33.4 (82.5) | 29.5 (72.8) | 0.7 (1.7) | - |
| 2010 | 21.8 (53.8) | 34.2 (84.4) | 2.0 (5.0) | - |
| 2015 | 17.4 (43.0) | 18.7 (46.3) | - | - |
| 2020 | 38.5 (95.0) | 11.4 (28.1) | - | - |
| 2025 | 36.3 (89.7) | 33.5 (82.8) | 20.8 (51.3) | - |

**Table 13B-01.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bromus tectorum[ai] (cheatgrass) | Pleuraphis jamesii (James' galleta) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | - | 480 | 124 | - | 51 |
| 2000 | 1 | 415 | 84 | 26 | 52 |
| 2005 | - | 425 | 52 | 25 | 144 |
| 2010 | - | 446 | 63 | 40 | 17 |
| 2015 | - | 405 | 98 | 112 | 46 |
| 2020 | - | 392 | 114 | 80 | 265 |
| 2025 | - | 410 | 81 | 34 | 317 |
| year | Average Cover (%) | | | | |
| 1995 | - | 12.3 | 2.0 | - | 0.1 |
| 2000 | 0.1 | 12.1 | 1.8 | 0.8 | 0.3 |
| 2005 | - | 23.6 | 0.9 | 0.5 | 4.3 |
| 2010 | - | 23.3 | 2.6 | 1.9 | 0.0 |
| 2015 | - | 7.6 | 2.2 | 3.1 | 0.2 |
| 2020 | - | 13.3 | 3.2 | 1.7 | 4.4 |
| 2025 | - | 13.3 | 2.9 | 0.9 | 5.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-01.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Astragalus (milkvetch) | Chaenactis stevioides[a] (Esteve's pincushion) | Chaetopappa ericoides (rose heath) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Chenopodium pratericola[a] (desert goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha gracilis[a] (narrowstem cryptantha) | Draba nemorosa[a] (woodland draba) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erodium cicutarium[ai] (redstem stork's bill) | Gilia sinuata[a] (rosy gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Machaeranthera canescens (hoary tansyaster) | Navarretia intertexta[a] (needleleaf navarretia) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 4 | 3 | 55 | - | - | - | - | 12 | 3 | - | 40 | - | 1 | 137 | - | 66 |
| 2000 | - | - | - | 15 | 42 | - | - | - | - | 14 | - | 86 | - | 6 | 26 | 1 | 19 |
| 2005 | - | 1 | 2 | 4 | 10 | - | - | - | - | 1 | - | 296 | 2 | 12 | 112 | 7 | 6 |
| 2010 | - | 4 | - | 8 | 93 | - | - | - | 31 | - | - | 276 | 8 | 37 | 65 | 105 | - |
| 2015 | - | - | - | 13 | - | - | - | - | - | 3 | 5 | 428 | - | - | 17 | 14 | - |
| 2020 | 9 | - | - | 16 | - | 3 | - | 2 | - | - | - | 306 | - | - | 12 | 60 | - |
| 2025 | 8 | - | - | 20 | - | - | 4 | - | - | - | - | 285 | 2 | - | - | 44 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | 0.0 | 0.5 | - | - | - | - | 0.0 | 0.0 | - | 0.5 | - | 0.0 | 0.8 | - | 0.1 |
| 2000 | - | - | - | 0.1 | 0.1 | - | - | - | - | 0.0 | - | 1.3 | - | 0.0 | 0.2 | 0.0 | 0.1 |
| 2005 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | 0.0 | - | 10.1 | 0.0 | 0.0 | 0.8 | 0.1 | 0.0 |
| 2010 | - | 0.4 | - | 0.3 | 0.3 | - | - | - | 0.2 | - | - | 3.8 | 0.0 | 0.1 | 0.2 | 0.5 | - |
| 2015 | - | - | - | 0.2 | - | - | - | - | - | 0.0 | 0.0 | 12.6 | - | - | 0.0 | 0.1 | - |
| 2020 | 0.0 | - | - | 0.5 | - | 0.0 | - | 0.0 | - | - | - | 5.5 | - | - | 0.0 | 0.3 | - |
| 2025 | 0.0 | - | - | 0.4 | - | - | 0.0 | - | - | - | - | 4.9 | 0.0 | - | - | 0.2 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Oenothera albicaulis[a] (whitest evening primrose) | Oenothera pallida[a] (pale evening primrose) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea parvifolia (smallflower globemallow) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1995 | 11 | - | 224 | - | 167 | 7 |
| 2000 | - | - | 10 | - | 26 | 6 |
| 2005 | 3 | - | 168 | 74 | 23 | 25 |
| 2010 | 15 | - | 74 | 284 | 27 | 19 |
| 2015 | - | - | 82 | 265 | 4 | 9 |
| 2020 | - | - | 12 | 15 | 65 | 1 |
| 2025 | - | 4 | 51 | 1 | 38 | 11 |
| year | Average Cover (%) | | | | | |
| 1995 | 0.0 | - | 0.6 | - | 0.9 | 0.0 |
| 2000 | - | - | 0.1 | - | 0.2 | 0.0 |
| 2005 | 0.0 | - | 0.6 | 0.2 | 0.5 | 0.8 |
| 2010 | 0.0 | - | 0.2 | 5.2 | 0.3 | 1.5 |
| 2015 | - | - | 0.2 | 4.4 | 0.0 | 0.1 |
| 2020 | - | - | 0.0 | 0.1 | 0.5 | 0.0 |
| 2025 | - | 0.0 | 0.2 | 0.0 | 0.3 | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-01.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. tridentata[p] (basin big sagebrush) | Gutierrezia sarothrae (broom snakeweed) |
|---|---|---|
| year | Line Intercept | |
| 1995 | - | - |
| 2000 | - | - |
| 2005 | 0 | - |
| 2010 | - | - |
| 2015 | - | - |
| 2020 | - | - |
| 2025 | - | - |
| year | Quadrat Cover (%) | |
| 1995 | 1.7 | - |
| 2000 | 2.4 | - |
| 2005 | 0.2 | - |
| 2010 | 0.2 | 0.0 |
| 2015 | - | - |
| 2020 | - | - |
| 2025 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-01.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

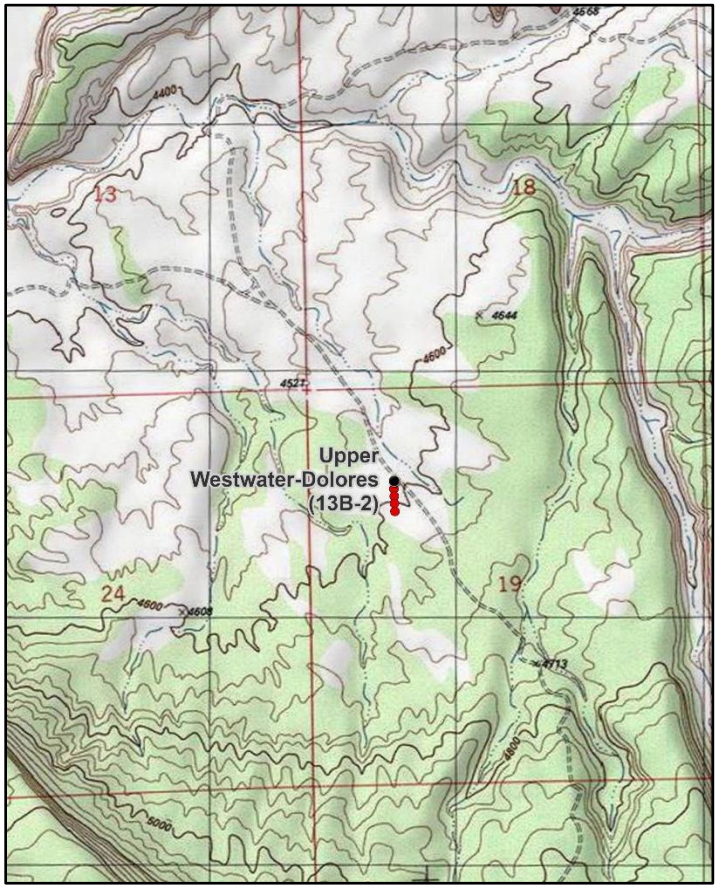
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. tridentata[p] -- (basin big sagebrush) | | | | | | | | | |
| 1995 | 1480 | - | 1 | 66 | 32 | 15 | 3 | 26 | 62/78 |
| 2000 | 1240 | - | 2 | 45 | 53 | 52 | 24 | 26 | 52/79 |
| 2005 | 60 | - | 0 | 33 | 67 | 0 | 100 | 67 | 34/59 |
| 2010 | 40 | - | 0 | 0 | 100 | 0 | 0 | 100 | 52/66 |
| 2015 | - | - | - | - | - | - | - | - | 35/68 |
| 2020 | - | - | - | - | - | - | - | - | 46/69 |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 59/33 |
| 2010 | - | - | - | - | - | - | - | - | 82/139 |
| 2015 | - | - | - | - | - | - | - | - | 111/109 |
| 2020 | - | - | - | - | - | - | - | - | 92/127 |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 44/67 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 59/108 |
| 2010 | - | - | - | - | - | - | - | - | 65/115 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 32/39 |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 30/31 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/ - |
| 2005 | - | - | - | - | - | - | - | - | 30/34 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/45 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 18/ - |
| 2005 | - | - | - | - | - | - | - | - | 18/90 |
| 2010 | - | - | - | - | - | - | - | - | 16/24 |
| 2015 | - | - | - | - | - | - | - | - | 15/64 |
| 2020 | - | - | - | - | - | - | - | - | 39/68 |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 53/102 |

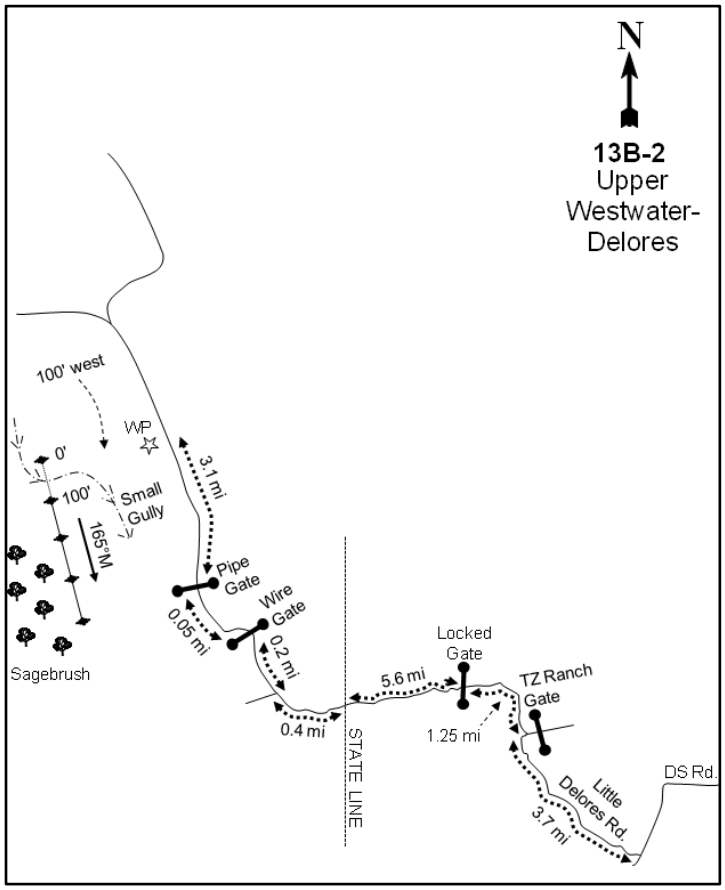
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-01.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 2.1 | 0.0 | 0.0 | 4.0 | -9.3 | 1.1 | 0.0 | **-2.1** | Very Poor |
| 2000 | 3.0 | 0.0 | 0.0 | 5.5 | -9.3 | 0.3 | 0.0 | **-0.5** | Very Poor |
| 2005 | 0.0 | 0.0 | 0.0 | 2.8 | -20.0 | 1.7 | 0.0 | **-15.5** | Very Poor |
| 2010 | 0.0 | 0.0 | 0.0 | 9.0 | -17.5 | 5.5 | 0.0 | **-3.0** | Very Poor |
| 2015 | 0.0 | 0.0 | 0.0 | 10.6 | -5.8 | 1.1 | 0.0 | **5.9** | Very Poor |
| 2020 | 0.0 | 0.0 | 0.0 | 9.8 | -13.3 | 1.6 | 0.0 | **-1.9** | Very Poor |
| 2025 | 0.0 | 0.0 | 0.0 | 7.6 | -14.1 | 1.4 | 0.0 | **-5.1** | Very Poor |

# UPPER WESTWATER-DOLORES - STUDY NO. 13B-2




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Westwater SW; Township 20S, Range 26E, Section 19 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 665684 East 4324751 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7867 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the intersection of DS Road and A Road west of Glade Park, Colorado, go down A Road 3.7 miles to the TZ Ranch gate. Turn left and travel 1.25 miles to a locked gate (you must obtain permission and a key). Continue 5.6 miles through the valley to the state line. Proceed 0.4 miles to a cabin, then turn right and go along the edge of a field for 0.2 miles to a wire gate. Continue 0.05 miles to a locked pipe gate, and then 3.1 miles on the main road to the transect. There is a rebar witness post 10-15 feet off of the left (west) side of the road. The 0-foot baseline stake, a rebar with browse tag #7867, is 100 feet due west of the witness post.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | BUCKHORN |
| Elevation | 4,600ft (1,402m) |
| Aspect | North |
| Slope | 4-6% |
| Sample Dates | 06/08/1995, 05/24/2000, 05/25/2005, 05/26/2010, 05/20/2015, 05/19/2020, 05/20/2025 |

**Table 13B-02.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Plateau | Moab Cheat grass control and seeding (Proposed) | 7359 | Winter-Spring 2026 | 7292 |
| Fire - Wildfire | Snyder 3 | - | July 1986 | 1200 |

## Wildlife Habitat and Vegetation History

**Table 13B-02.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |

**Table 13B-02.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Basin Big Sagebrush | No Encroachment |
| 1995 | Annual Grass | No Encroachment |
| 2000 | Annual Grass-Weed | No Encroachment |
| 2005 | Annual Grass-Weed | No Encroachment |
| 2010 | Annual Grass-Weed | No Encroachment |
| 2015 | Annual Grass-Weed | No Encroachment |
| 2020 | Annual Grass | No Encroachment |
| 2025 | Annual Grass | No Encroachment |

## Site Notes

The site was burned between 1986 and 1995, likely as part of the Snyder 3 wildfire, which burned 1200 acres of the area in 1986. It is also likely that the site has burned again since 1995.

## Soils

**Table 13B-02.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.2 | 56.0 | 26.0 | 18.0 | 0.4 | 8.4 | 163.2 | 0.5 | 05/24/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Semidesert Sandy Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R035XY216UT |
| States and Transitions | 1986 - Current Potential State: Community Phase 2.1<br>1995-2025 - State Undefined: Community Phase Undefined |

This site existed as a basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) vegetation community type when it was established in 1986, but in July of the same year a wildfire burned the area (Pre-1992 Data, Table 13B-02.1). Following the wildfire, the site transitioned to a community dominated by annual grasses, namely the introduced annual species cheatgrass (*Bromus tectorum*) (Table 13B-02.10). Between 2000 and 2015, annual grasses and weedy forbs were co-dominant vegetation components, including the introduced species redstem stork's bill (*Erodium cicutarium*) and prickly Russian thistle (*Salsola tragus*). Cover of annual forbs decreased while that of cheatgrass increased substantially in 2020, and cheatgrass has remained the sole dominant vegetation component since that time (Table 13B-02.7, Table 13B-02.10, Table 13B-02.11). The plant community on this site may have a higher potential for change as most of the vegetation on the site is annual.

Deer winter range condition on this site has remained very poor since 1995. Improvements to deer winter range could be achieved by increasing recruitment of young and overall cover in the preferred browse community. Additional improvement could come from diversifying and increasing the cover of perennial grasses and forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-02.6, Table 13B-02.7, Table 13B-02.13, Table 13B-02.15). Pellet group data suggests that deer and elk presence has remained low since 1995. Cattle presence has varied between moderate and high over the same period (Table 13B-02.9). On-site observations in 2025 noted little to no utilization on grass species, but light utilization (10-20%) on a wirelettuce (*Stephanomeria* spp.) species.

## Trend Summary Tables

**Table 13B-02.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | - | - | - | - | - | - |
| 2000 | - | 0.0 | - | - | - | - |
| 2005 | - | - | - | - | - | - |
| 2010 | - | - | - | - | - | - |
| 2015 | - | - | - | - | - | - |
| 2020 | - | - | - | - | - | - |
| 2025 | - | - | - | - | - | - |

**Table 13B-02.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 481 | 48 | 424 | 70 | 19.2 | 0.7 | 8.3 | 0.3 |
| 2000 | 425 | 58 | 379 | 27 | 6.3 | 2.1 | 13.6 | 0.7 |
| 2005 | 455 | 64 | 454 | 66 | 20.9 | 1.0 | 25.9 | 1.4 |
| 2010 | 471 | 48 | 394 | 92 | 38.3 | 1.8 | 16.8 | 0.9 |
| 2015 | 464 | 239 | 447 | 98 | 21.6 | 9.8 | 17.9 | 1.3 |
| 2020 | 491 | 213 | 375 | 51 | 61.6 | 4.7 | 8.1 | 0.8 |
| 2025 | 494 | 21 | 307 | 15 | 70.3 | 0.7 | 8.4 | 0.2 |

**Table 13B-02.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 13.8 | 3.0 | 58.8 | - | 0.0 | 47.1 |
| 2000 | 28.9 | 16.6 | 35.7 | 0.0 | 0.0 | 26.6 |
| 2005 | 29.6 | 6.2 | 19.9 | - | - | 49.6 |
| 2010 | 23.1 | 0.5 | 43.7 | 0.0 | - | 57.1 |
| 2015 | 23.1 | 2.1 | 46.2 | 0.0 | - | 49.9 |
| 2020 | 11.0 | 4.6 | 45.0 | - | - | 66.5 |
| 2025 | 1.8 | 0.3 | 67.8 | 0.2 | - | 75.1 |

**Table 13B-02.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit | Wild Turkey |
|---|---|---|---|---|---|
| | Quadrat Frequency | | | | |
| 1995 | 9 | 10 | - | 9 | - |
| 2000 | 25 | 9 | - | 2 | - |
| 2005 | 29 | 7 | - | 7 | - |
| 2010 | 23 | 2 | - | 11 | - |
| 2015 | 19 | 2 | - | 7 | - |
| 2020 | 12 | 6 | - | - | - |
| 2025 | 1 | 7 | 3 | 3 | 1 |
| Year | Days Use Per Acre (ha) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | 50.8 (125.5) | 8.1 (19.9) | - | - | - |
| 2005 | 57.4 (141.7) | 6.0 (14.9) | - | - | - |
| 2010 | 37.7 (93.2) | 9.4 (23.2) | 0.7 (1.7) | - | - |
| 2015 | 16.7 (41.2) | 2.7 (6.6) | 1.3 (3.3) | - | - |
| 2020 | 53.0 (130.9) | - | 1.3 (3.3) | - | - |
| 2025 | 18.1 (44.8) | 4.0 (9.9) | 0.7 (1.7) | - | - |

**Table 13B-02.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Pleuraphis jamesii (James' galleta) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 2 | 462 | 46 | - | 329 |
| 2000 | 7 | 210 | 38 | 16 | 400 |
| 2005 | - | 280 | 32 | 32 | 412 |
| 2010 | - | 470 | 38 | 10 | 55 |
| 2015 | 1 | 338 | 81 | 164 | 435 |
| 2020 | 2 | 487 | 52 | 168 | 325 |
| 2025 | 1 | 492 | 12 | 8 | 185 |
| year | Average Cover (%) | | | | |
| 1995 | 0.0 | 16.2 | 0.7 | - | 3.0 |
| 2000 | 0.2 | 0.9 | 0.9 | 0.9 | 5.4 |
| 2005 | - | 6.0 | 0.4 | 0.7 | 14.9 |
| 2010 | - | 38.1 | 1.2 | 0.6 | 0.2 |
| 2015 | 0.0 | 4.9 | 4.7 | 5.0 | 16.6 |
| 2020 | 0.0 | 57.0 | 1.5 | 3.2 | 4.6 |
| 2025 | 0.1 | 69.3 | 0.4 | 0.1 | 1.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-02.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Astragalus nuttallianus[a] (smallflowered milkvetch) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba cuneifolia[a] (wedgeleaf draba) | Erigeron (fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Erodium cicutarium[ai] (redstem stork's bill) | Lepidium ramosissimum[a] (manybranched pepperweed) | Machaeranthera canescens (hoary tansyaster) | Navarretia intertexta[a] (needleleaf navarretia) | Oenothera pallida[a] (pale evening primrose) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 17 | 3 | - | - | - | 1 | - | - | 2 | 2 | - | 46 | 75 | 6 | 54 | - |
| 2000 | - | - | - | - | 12 | - | - | - | 28 | - | - | - | 261 | 10 | - | 11 | - |
| 2005 | - | 9 | 46 | - | - | - | - | 35 | 73 | - | - | - | 429 | 3 | 5 | 2 | - |
| 2010 | - | - | 47 | - | 9 | 2 | - | 22 | 17 | - | - | - | 287 | 5 | 46 | - | 1 |
| 2015 | - | 5 | - | - | - | - | 4 | - | 36 | - | - | 3 | 397 | - | 13 | - | 8 |
| 2020 | 10 | - | 12 | 0 | - | - | - | 9 | 1 | - | 8 | - | 347 | - | 5 | - | - |
| 2025 | 27 | - | - | - | - | - | - | - | 1 | - | - | - | 299 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | 0.0 | - | - | - | 0.0 | - | - | 0.0 | 0.0 | - | 0.1 | 0.2 | 0.0 | 0.2 | - |
| 2000 | - | - | - | - | 0.0 | - | - | - | 0.0 | - | - | - | 9.7 | 0.1 | - | 0.0 | - |
| 2005 | - | 0.2 | 0.2 | - | - | - | - | 0.1 | 0.3 | - | - | - | 20.7 | 0.0 | 0.0 | 0.0 | - |
| 2010 | - | - | 0.4 | - | 0.0 | 0.0 | - | 0.5 | 0.0 | - | - | - | 5.7 | 0.2 | 0.2 | - | 0.0 |
| 2015 | - | 0.0 | - | - | - | - | 0.0 | - | 0.1 | - | - | 0.1 | 10.3 | - | 0.2 | - | 0.0 |
| 2020 | 0.0 | - | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.2 | - | 7.5 | - | 0.0 | - | - |
| 2025 | 0.1 | - | - | - | - | - | - | - | 0.0 | - | - | - | 7.8 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Sphaeralcea grossulariifolia (gooseberryleaf globemallow) | Sphaeralcea parvifolia (smallflower globemallow) | Townsendia (Townsend daisy) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | 327 | - | 364 | 60 | - | - | - |
| 2000 | 6 | 11 | 280 | 27 | - | - | - |
| 2005 | 11 | 298 | 60 | 9 | - | 10 | - |
| 2010 | 11 | 301 | 9 | 2 | - | 4 | - |
| 2015 | 3 | 328 | 109 | 2 | - | 78 | 3 |
| 2020 | - | 16 | 81 | 23 | 2 | 13 | - |
| 2025 | - | - | 21 | 11 | 3 | 1 | - |
| year | Average Cover (%) | | | | | | |
| 1995 | 1.9 | - | 5.8 | 0.3 | - | - | - |
| 2000 | 0.0 | 0.0 | 3.7 | 0.7 | - | - | - |
| 2005 | 0.0 | 3.8 | 0.8 | 0.5 | - | 0.6 | - |
| 2010 | 0.0 | 10.2 | 0.2 | 0.0 | - | 0.3 | - |
| 2015 | 0.0 | 6.3 | 1.0 | 0.0 | - | 0.9 | 0.0 |
| 2020 | - | 0.0 | 0.3 | 0.4 | 0.0 | 0.3 | - |
| 2025 | - | - | 0.5 | 0.1 | 0.1 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-02.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Gutierrezia sarothrae (broom snakeweed) |
|---|---|
| year | Line |
| 1995 | - |
| 2000 | - |
| 2005 | - |
| 2010 | - |
| 2015 | - |
| 2020 | - |
| 2025 | - |
| year | Quadrat Cover (%) |
| 1995 | - |
| 2000 | 0.0 |
| 2005 | - |
| 2010 | - |
| 2015 | - |
| 2020 | - |
| 2025 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-02.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

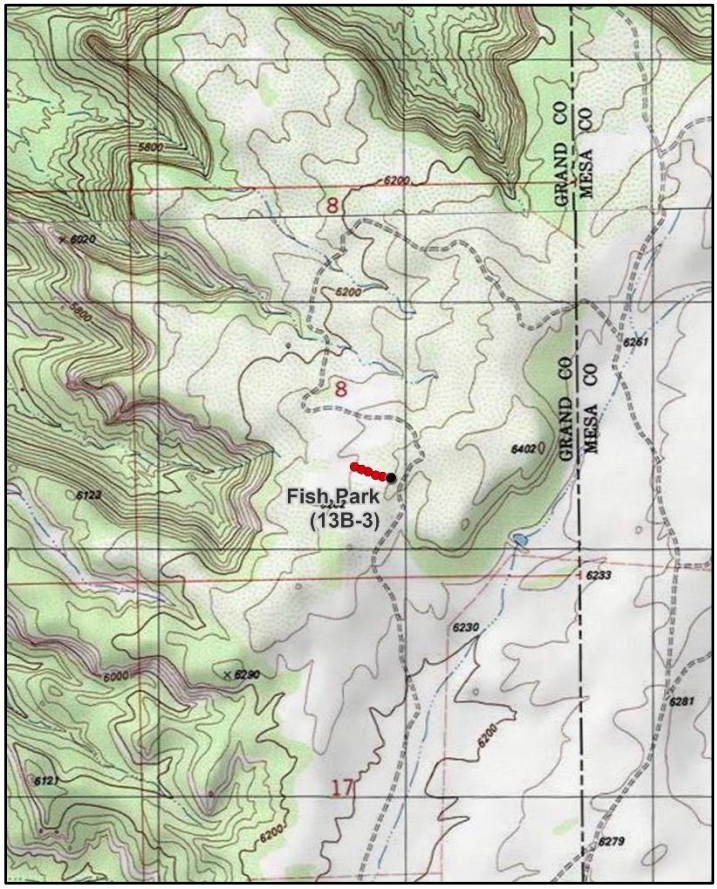
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Echinocereus coccineus -- (scarlet hedgehog cactus) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 23/47 |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 16/30 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 20/30 |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 19/126 |
| 2010 | - | - | - | - | - | - | - | - | 19/21 |
| 2015 | - | - | - | - | - | - | - | - | 14/39 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/75 |

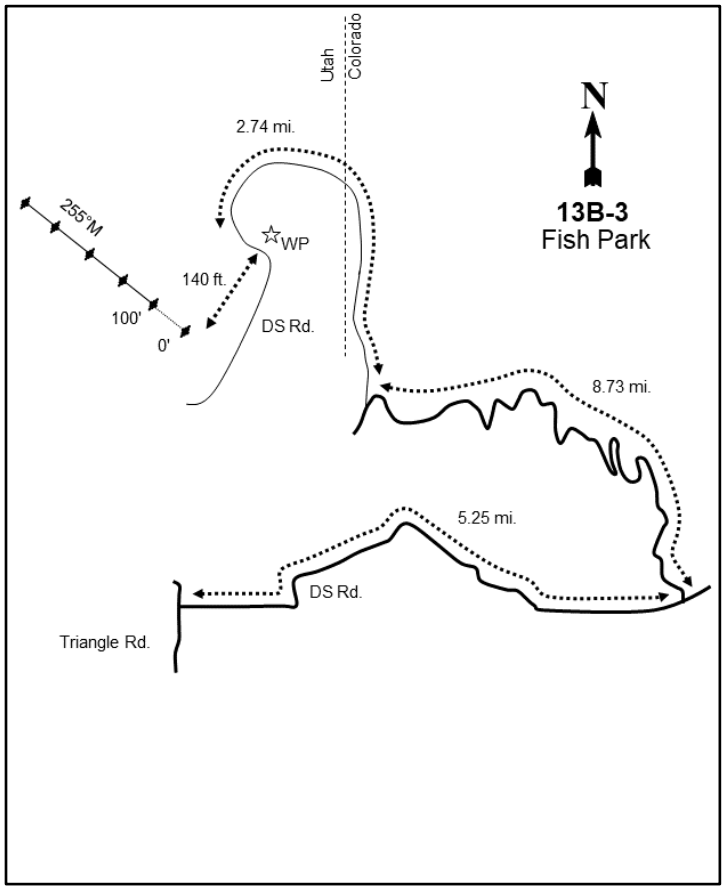
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-02.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 0.0 | 0.0 | 0.0 | 1.4 | -14.4 | 0.6 | 0.0 | **-12.4** | Very Poor |
| 2000 | 0.0 | 0.0 | 0.0 | 4.2 | -4.7 | 1.5 | 0.0 | **1.0** | Very Poor |
| 2005 | 0.0 | 0.0 | 0.0 | 2.0 | -15.6 | 2.8 | 0.0 | **-10.8** | Very Poor |
| 2010 | 0.0 | 0.0 | 0.0 | 3.5 | -20.0 | 1.8 | 0.0 | **-14.7** | Very Poor |
| 2015 | 0.0 | 0.0 | 0.0 | 19.5 | -16.2 | 2.6 | 0.0 | **5.9** | Very Poor |
| 2020 | 0.0 | 0.0 | 0.0 | 9.5 | -20.0 | 1.6 | 0.0 | **-8.9** | Very Poor |
| 2025 | 0.0 | 0.0 | 0.0 | 1.4 | -20.0 | 0.4 | 0.0 | **-18.2** | Very Poor |

# FISH PARK - STUDY NO. 13B-3




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Marble Canyon NE; Township 21S, Range 26E, Section 08 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 667883 East 4317496 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7874 |
| Transect Bearing | 255° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | No Rebar |

## Directions to Site

From the Utah-Colorado state line west of Glade Park, go west for 2.1 miles on Coates Creek Road to a cattle guard. Continue on the main road 2.1 miles to a pinyon-juniper area bordered on the right by large sandstone cliffs. The witness post is on the right (north) side of the road. The baseline starts 140 feet south (across the road) from the witness post. A short rebar, tagged #7816, marks the 0-foot end of the baseline.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | No data |
| Elevation | 6,300ft (1,920m) |
| Aspect | West |
| Slope | 6-8% |
| Sample Dates | 06/08/1995, 05/24/2000, 05/25/2005, 05/26/2010, 05/19/2020, 05/21/2025 |

**Table 13B-03.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Plateau | Moab Cheat grass control and seeding (Proposed) | 7359 | Winter-Spring 2026 | 7292 |
| Chaining - Two-Way Unknown | Fish Park Seeding 1967 | LTDL 4259-11928 | August 1967-May 1968 | 490 |
| Seeding - Aerial Before | Fish Park Seeding 1967 | LTDL 4259-11929 | August 1967 | 490 |

**Table 13B-03.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| | | | Aerial | Aug 1967 | 490 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron desertorum | Crested Wheatgrass | | 0.00 | 0.00 |
| S | Artemisia | Sagebrush | | 0.00 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 0.00 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 13B-03.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-03.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 1995 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 2000 | Wyoming Big Sagebrush/Pinyon-Juniper | Phase I transitioning to Phase II |
| 2005 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II |
| 2010 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II |
| 2020 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II |
| 2025 | Pinyon-Juniper/Wyoming Big Sagebrush | Phase II |

## Site Notes

No Notes

## Soils

**Table 13B-03.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 6.8 | 48.0 | 30.0 | 22.0 | 1.0 | 5.9 | 60.8 | 0.6 | 05/24/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Upland Loam (Big Sagebrush) |
| NRCS Ecological Site # | R036XY306UT |
| States and Transitions | 1986-2000 - Current Potential State: Community Phase 2.3<br>2005-2025 - Pinyon-Utah Juniper State: Community Phase 3.1 |

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has been the dominant browse species on this site since study establishment in 1986, although cover and density have decreased overall; other shrub species have remained rare. Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have been present throughout the study period (Pre-1992 Data). Juniper cover has increased over time, and the study site has remained within Phase II of woodland succession since 2005 (Photos, Table 13B-03.4, Table 13B-03.12, Table 13B-03.13, Table 13B-03.14). Encroachment will likely continue in the future without a major tree-removing disturbance. Composition of the herbaceous understory has varied over time. The introduced (and seeded) perennial grass species crested wheatgrass (*Agropyron cristatum*) provided the most herbaceous cover in the 2000, 2010, 2020, and 2025 sample years. In 1995 and 2005, however, the introduced annual grass species cheatgrass (*Bromus tectorum*) contributed the most cover of any single herbaceous species (Table 13B-03.10). Forbs have remained rare but diverse (Table 13B-03.11).

Deer winter range condition on this site has varied between very poor-poor and fair over the course of the study, and it was considered to be very poor-poor in 2025. Improvements to deer winter range could be achieved by increasing recruitment of young and overall cover in the preferred browse community. Improvement could also come from diversifying and increasing the cover of perennial forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-03.6, Table 13B-03.7, Table 13B-03.13, Table 13B-03.15). Pellet group data suggests that deer presence has been low over the course of the study. However, elk presence has generally varied between low and moderate over the same period,

and was high in 2010 (Table 13B-03.9). Utilization of Wyoming big sagebrush was generally moderate in 2005, 2020, and 2025. More specifically, over 50% of sagebrush plants sampled in density strips were moderately to heavily hedged in those years (Table 13B-03.13). On-site observations in 2025 noted little to no utilization on herbaceous species.

## Trend Summary Tables

**Table 13B-03.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 11.5 | 0.4 | 8.9 | - | - | - |
| 2000 | 16.6 | 0.9 | 12.3 | - | - | - |
| 2005 | 8.2 | 0.3 | 9.1 | 10.9 | 0.2 | 15.7 |
| 2010 | 8.3 | 0.2 | 9.5 | 10.9 | 0.4 | 8.7 |
| 2020 | 5.4 | 0.0 | 6.6 | 7.7 | - | 14.7 |
| 2025 | 5.1 | 0.0 | 8.3 | 6.2 | - | 15.6 |

**Table 13B-03.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 378 | 227 | 250 | 152 | 5.7 | 3.9 | 0.8 | 1.4 |
| 2000 | 175 | 254 | 67 | 148 | 1.1 | 6.7 | 0.2 | 1.6 |
| 2005 | 378 | 221 | 190 | 120 | 20.8 | 10.9 | 2.1 | 1.5 |
| 2010 | 304 | 245 | 86 | 46 | 6.3 | 19.8 | 0.3 | 0.6 |
| 2020 | 384 | 257 | 237 | 59 | 9.8 | 14.5 | 1.8 | 0.6 |
| 2025 | 309 | 257 | 255 | 38 | 6.7 | 18.9 | 2.3 | 0.8 |

**Table 13B-03.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 24.4 | 5.6 | 44.2 | 0.0 | 0.1 | 37.3 |
| 2000 | 31.6 | 10.9 | 48.2 | 0.2 | 0.3 | 40.8 |
| 2005 | 25.0 | 2.5 | 35.5 | 0.1 | 0.1 | 50.7 |
| 2010 | 20.2 | 4.7 | 51.6 | 0.4 | 0.1 | 44.8 |
| 2020 | 26.4 | 7.1 | 57.7 | 0.4 | 0.4 | 37.5 |
| 2025 | 17.9 | 7.4 | 59.7 | 0.3 | 0.4 | 37.2 |

**Table 13B-03.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 5 | 3 | - | 48 |
| 2000 | 1 | 7 | - | 20 |
| 2005 | - | 20 | 11 | 49 |
| 2010 | - | 20 | 21 | 28 |
| 2020 | 8 | 22 | 18 | 39 |
| 2025 | 2 | 15 | 16 | 21 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 2.9 (7.2) | 14.1 (34.8) | 0.7 (1.7) | - |
| 2005 | 2.2 (5.4) | 13.4 (33.1) | 23.4 (57.9) | - |
| 2010 | 0.7 (1.8) | 14.7 (36.4) | 49.6 (122.5) | - |
| 2020 | 3.6 (9.0) | 8.1 (19.9) | 28.8 (71.2) | - |
| 2025 | - | 15.4 (38.1) | 30.2 (74.5) | - |

**Table 13B-03.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 124 | 331 | 1 | 8 | 92 | - | 45 | - | - | - | 220 |
| 2000 | 188 | 141 | - | 24 | 69 | - | 25 | - | 2 | - | 86 |
| 2005 | 147 | 312 | 9 | 23 | 27 | 5 | 23 | 29 | - | 2 | 282 |
| 2010 | 177 | 299 | 10 | 12 | 13 | 11 | 10 | 59 | - | - | 29 |
| 2020 | 199 | 377 | 1 | 16 | 24 | 3 | 15 | 62 | - | - | 157 |
| 2025 | 210 | 304 | - | 13 | 14 | 32 | - | 29 | - | 6 | 80 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 2.3 | 4.4 | 0.0 | 0.0 | 0.5 | - | 1.1 | - | - | - | 1.2 |
| 2000 | 5.8 | 0.8 | - | 0.4 | 0.5 | - | 0.1 | - | 0.0 | - | 0.4 |
| 2005 | 7.5 | 12.8 | 0.2 | 0.7 | 0.4 | 0.0 | 0.6 | 1.5 | - | 0.0 | 8.0 |
| 2010 | 15.8 | 6.3 | 0.3 | 1.6 | 0.3 | 0.2 | 0.3 | 1.1 | - | - | 0.1 |
| 2020 | 12.5 | 9.4 | 0.0 | 0.4 | 0.8 | 0.0 | 0.1 | 0.5 | - | - | 0.4 |
| 2025 | 16.0 | 6.1 | - | 0.9 | 0.5 | 0.5 | - | 0.7 | - | 0.2 | 0.6 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-03.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Aliciella hutchinsifolia[a] (desert pale gilia) | Allium (onion) | Alyssum desertorum[ai] (desert madwort) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus lentiginosus (freckled milkvetch) | Astragalus miser (timber milkvetch) | Astragalus mollissimus (woolly locoweed) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Cryptantha[a] (annual cryptantha) | Cymopterus (springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 2 | 45 | - | - | - | 15 | - | - | 14 | 2 | - | 2 | - | - | 2 | - | 23 |
| 2000 | - | - | - | - | - | 9 | - | - | 5 | - | - | 0 | - | - | - | - | 1 |
| 2005 | - | 45 | 3 | - | 5 | - | - | - | 5 | 5 | - | - | - | 6 | 2 | - | 12 |
| 2010 | - | 15 | - | - | 2 | - | - | - | - | 3 | - | 1 | 3 | - | - | 7 | - |
| 2020 | - | - | - | 179 | 4 | 10 | - | - | 3 | - | - | 2 | 25 | - | 4 | - | 1 |
| 2025 | - | - | - | 244 | - | - | 1 | 3 | - | - | 1 | - | 68 | - | 10 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.1 | - | - | - | 0.4 | - | - | 0.2 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 |
| 2000 | - | - | - | - | - | 0.1 | - | - | 0.1 | - | - | 0.0 | - | - | - | - | 0.0 |
| 2005 | - | 0.1 | 0.0 | - | 0.0 | - | - | - | 0.2 | 0.0 | - | - | - | 0.0 | 0.0 | - | 0.7 |
| 2010 | - | 0.0 | - | - | 0.2 | - | - | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | - |
| 2020 | - | - | - | 1.5 | 0.1 | 0.2 | - | - | 0.0 | - | - | 0.0 | 0.1 | - | 0.0 | - | 0.0 |
| 2025 | - | - | - | 2.1 | - | - | 0.0 | 0.1 | - | - | 0.1 | - | 0.2 | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Draba nemorosa[a] (woodland draba) | Erigeron pumilus (shaggy fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Ipomopsis aggregata (scarlet gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Lithospermum (stoneseed) | Microsteris gracilis[a] (slender phlox) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Pleiacanthus spinosus (thorn skeletonweed) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Sisymbrium altissimum[ai] (tall tumblemustard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 104 | 8 | - | 35 | 1 | 19 | 23 | 6 | - | - | - | 98 | 133 | 2 | 10 | - | 9 |
| 2000 | 6 | 8 | - | - | - | - | 2 | - | 2 | 9 | 26 | 100 | 60 | - | - | - | - |
| 2005 | 15 | 8 | 4 | 7 | - | 10 | 4 | - | 13 | - | - | 90 | 123 | - | - | - | - |
| 2010 | - | 6 | 5 | - | - | 8 | 16 | - | - | 3 | - | 11 | 55 | - | - | 3 | - |
| 2020 | - | 3 | - | 12 | - | 11 | - | - | 41 | 2 | - | 24 | 48 | - | - | - | 1 |
| 2025 | - | 2 | - | - | - | 5 | - | - | - | 7 | - | 14 | 12 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.2 | 0.0 | - | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | - | - | - | 0.3 | 0.3 | 0.0 | 0.0 | - | 0.0 |
| 2000 | 0.0 | 0.1 | - | - | - | - | 0.0 | - | 0.0 | 0.1 | 0.3 | 0.7 | 0.2 | - | - | - | - |
| 2005 | 0.0 | 0.2 | 0.0 | 0.0 | - | 0.1 | 0.0 | - | 0.1 | - | - | 0.9 | 1.0 | - | - | - | - |
| 2010 | - | 0.2 | 0.0 | - | - | 0.0 | 0.1 | - | - | 0.0 | - | 0.0 | 0.1 | - | - | 0.0 | - |
| 2020 | - | 0.0 | - | 0.0 | - | 0.0 | - | - | 0.1 | 0.1 | - | 0.1 | 0.1 | - | - | - | 0.0 |
| 2025 | - | 0.0 | - | - | - | 0.0 | - | - | - | 0.4 | - | 0.1 | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sphaeralcea coccinea (scarlet globemallow) | Stenotus acaulis (stemless mock goldenweed) | Streptanthus cordatus (heartleaf twistflower) | Trifolium (clover) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 35 | 3 | 1 | 4 | - |
| 2000 | 14 | - | - | - | - |
| 2005 | 16 | - | - | - | - |
| 2010 | 13 | 1 | - | - | 3 |
| 2020 | 8 | 1 | - | 5 | - |
| 2025 | 2 | - | 3 | 1 | - |
| year | Average Cover (%) | | | | |
| 1995 | 0.3 | 0.0 | 0.0 | 0.0 | - |
| 2000 | 0.3 | - | - | - | - |
| 2005 | 0.1 | - | - | - | - |
| 2010 | 0.0 | 0.0 | - | - | 0.0 |
| 2020 | 0.0 | 0.0 | - | 0.0 | - |
| 2025 | 0.0 | - | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-03.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (pricklypear) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | |
| 1995 | - | - | - | - | - |
| 2000 | - | - | - | - | - |
| 2005 | 10.9 | - | 12.1 | 0.2 | 3.6 |
| 2010 | 10.9 | 0.2 | 8.2 | 0.2 | 0.5 |
| 2020 | 7.7 | - | 14 | 0 | 0.7 |
| 2025 | 6.2 | - | 15.4 | - | 0.2 |
| year | Quadrat Cover (%) | | | | |
| 1995 | 11.5 | 0.1 | 6.2 | 0.4 | 2.7 |
| 2000 | 16.6 | 0.6 | 6.8 | 0.3 | 5.5 |
| 2005 | 8.2 | 0.0 | 7.3 | 0.3 | 1.9 |
| 2010 | 8.3 | 0.0 | 9.5 | 0.1 | 0.0 |
| 2020 | 5.4 | - | 6.6 | 0.0 | 0.0 |
| 2025 | 5.1 | - | 8.3 | 0.0 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-03.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 3240 | 1440 | 35 | 63 | 2 | 2 | 1 | 4 | 74/108 |
| 2000 | 4040 | 760 | 16 | 75 | 9 | 29 | 8 | 2 | 71/96 |
| 2005 | 2340 | 1380 | 2 | 41 | 57 | 44 | 10 | 39 | 74/105 |
| 2010 | 2500 | 100 | 10 | 65 | 26 | 29 | 5 | 11 | 64/94 |
| 2020 | 1840 | - | 5 | 51 | 44 | 39 | 25 | 22 | 64/90 |
| 2025 | 1720 | - | 1 | 55 | 44 | 26 | 30 | 44 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 200 | - | 30 | 70 | 0 | 0 | 0 | 0 | 24/30 |
| 2000 | 1640 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 17/25 |
| 2005 | 240 | - | 17 | 83 | 0 | 0 | 0 | 0 | 25/32 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/25 |
| 2020 | - | - | - | - | - | - | - | - | 13/28 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 160 | - | 13 | 75 | 13 | 0 | 0 | 13 | - / - |
| 2010 | 140 | - | 14 | 86 | 0 | 0 | 0 | 14 | - / - |
| 2020 | 200 | - | 20 | 70 | 10 | 0 | 0 | 10 | - / - |
| 2025 | 120 | - | 0 | 100 | 0 | 0 | 0 | 17 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 200 | - | 0 | 90 | 10 | 0 | 0 | 10 | 11/45 |
| 2000 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/29 |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/70 |
| 2010 | 320 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/34 |
| 2020 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/20 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

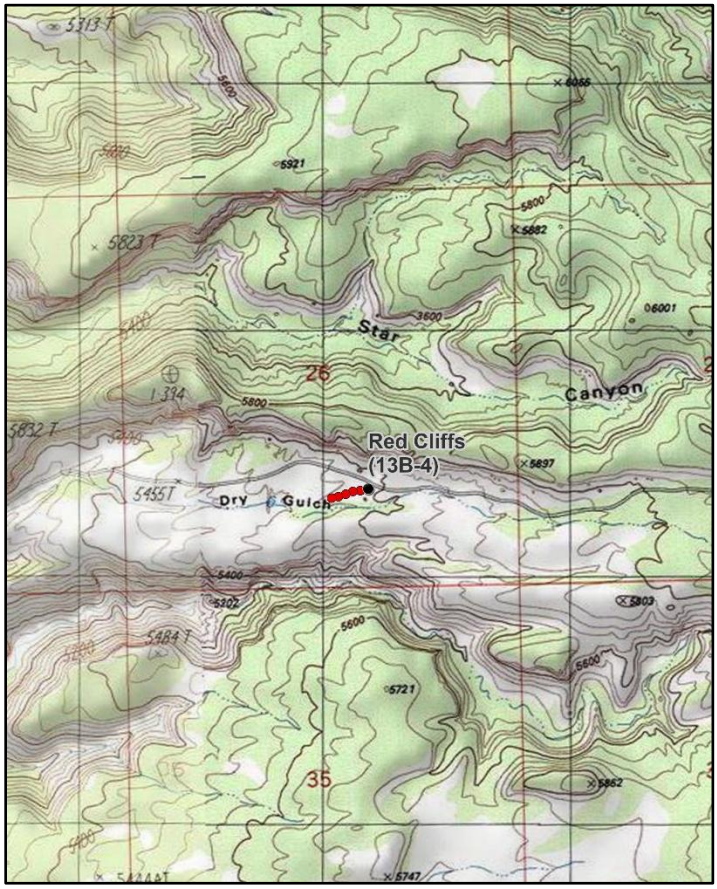
**Table 13B-03.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

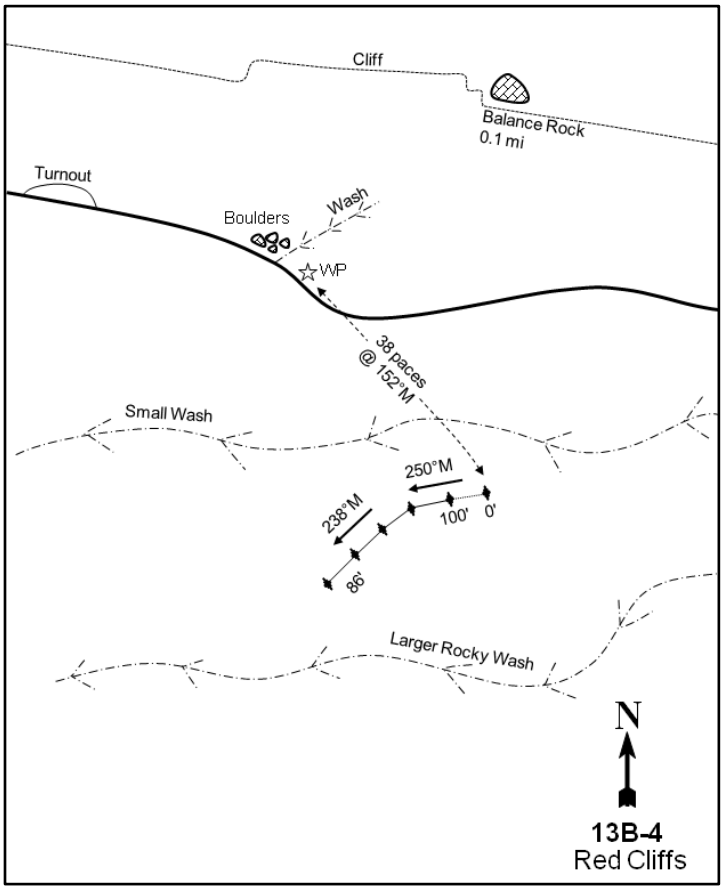
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 84 | - | - | - | - | - | 13.7 |
| 2000 | 78 | - | - | - | - | - | 12.5 |
| 2005 | 35 | - | - | 57 | 43 | - | 14.5 |
| 2010 | 94 | - | - | 37 | 37 | 26 | 21.6 |
| 2020 | 88 | - | - | 26 | 21 | 53 | 21.2 |
| 2025 | 84 | - | 5 | 5 | 53 | 37 | 27.3 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 15 | - | - | - | - | - | 9.0 |
| 2000 | 18 | - | - | - | - | - | 14.9 |
| 2005 | 44 | - | 13 | 38 | 25 | 25 | 13.0 |
| 2010 | 8 | - | 20 | 20 | 40 | 20 | 15.6 |
| 2020 | 9 | - | 17 | 17 | 67 | - | 13.0 |
| 2025 | 6 | - | - | - | 75 | 25 | 21.8 |

**Table 13B-03.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 14.4 | 14.4 | 15.0 | 7.8 | -4.2 | 2.7 | 0.0 | **50.1** | Poor-Fair |
| 2000 | 20.7 | 12.3 | 7.9 | 13.5 | -0.9 | 3.2 | 0.0 | **56.7** | Fair |
| 2005 | 13.6 | -2.2 | 0.9 | 21.8 | -15.6 | 3.1 | 0.0 | **21.6** | Very Poor |
| 2010 | 13.6 | 7.3 | 4.8 | 30.0 | -4.7 | 1.2 | 0.0 | **52.2** | Fair |
| 2020 | 9.6 | 2.0 | 2.7 | 28.9 | -7.4 | 1.2 | 0.0 | **37.0** | Very Poor-Poor |
| 2025 | 7.8 | 1.7 | 0.6 | 30.0 | -5.0 | 1.6 | 0.0 | **36.7** | Very Poor-Poor |
| 1995 | 14.4 | 14.4 | 15.0 | 7.8 | -4.2 | 2.7 | 0.0 | **50.1** | Poor-Fair |

# RED CLIFFS - STUDY NO. 13B-4




| Location Information | |
|---|---|
| USGS 7.5 min Map Info | Marble Canyon NW; Township 21S, Range 25E, Section 26 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 663120 East 4312556 North |

| Transect Information | |
|---|---|
| Browse Tag # (0' Stake) | 7816 |
| Transect Bearing | 240° magnetic (Lines 3-5: 245° magnetic) |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (86ft) |
| Belt Marker Placement | Belt 2: 1ft; Belts 3, 5: 2ft |

**Directions to Site**

From the Utah-Colorado state line west of Glade Park, travel west for 2.1 miles on Coates Creek Road to a cattle guard. Continue on the main road for 2.1 miles to a pinyon-juniper area bordered on the right by large sandstone cliffs. The witness post is on the right (north) side of the road. The baseline starts 140 feet south (across the road) from the witness post. A short rebar marked with browse tag #7816 indicates the 0-foot end of the baseline.

| Site Information | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SAND FLATS |
| Elevation | 5,600ft (1,707m) |
| Aspect | Southwest |
| Slope | 2-4% |
| Sample Dates | 06/02/1995, 07/01/2000, 05/26/2005, 05/27/2010, 05/19/2015, 05/20/2020, 05/19/2025 |

## Wildlife Habitat and Vegetation History

**Table 13B-04.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-04.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Blackbrush | Early Phase I |
| 1995 | Blackbrush | Phase I |
| 2000 | Blackbrush | Phase I |
| 2005 | Blackbrush/Annual Grass | Phase I |
| 2010 | Blackbrush/Annual Grass | Phase I |
| 2015 | Blackbrush | Phase I |
| 2020 | Blackbrush/Annual Grass | Phase I |
| 2025 | Blackbrush/Annual Grass | Phase I |

## Site Notes

There is a stock pond down a wash about one-tenth of a mile to the west of the transect, although livestock do not appear to utilize this site. To accommodate the increased sample area and stay within the same vegetation type, the position of the transect extension was slightly altered in 1995.

## Soils

**Table 13B-04.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.6 | 60.0 | 19.4 | 20.6 | 0.7 | 5.8 | 147.2 | 0.5 | 07/01/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Semidesert Sandy Loam (Blackbrush) |
| NRCS Ecological Site # | R035XY218UT |
| States and Transitions | 1986-2000 - Current Potential State: Community Phase 2.1<br>2005-2010 - Current Potential State: Community Phase 2.2<br>2015 - Current Potential State: Community Phase 2.1<br>2020-2025 - Current Potential State: Community Phase 2.2 |

Blackbrush (*Coleogyne ramosissima*) has been the dominant shrub species on this site since study establishment in 1986; other shrubs have been present, but they have contributed much less cover (Pre-1992 Data, Table 13B-04.12). The herbaceous understory has remained moderately diverse over the sample period. However, the introduced annual grass species cheatgrass (*Bromus tectorum*) has been the most abundant herbaceous species throughout the duration of the study. Although cheatgrass cover has fluctuated over time, it was a co-dominant vegetation component in 2005, 2010, 2020, and 2025. Forbs have generally remained rare (Table 13B-04.7, Table 13B-04.10, Table 13B-04.11). Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have been scattered across the transect in all sample years (Photos, Table 13B-04.12, Table 13B-04.13, Table 13B-04.14). The study site has remained within Phase I of woodland succession since 1986 (Table 13B-04.4), but further encroachment could be possible over time.

Deer winter range condition on this site has decreased from poor-fair to poor since 2005. Improvements to deer winter range could be achieved by increasing recruitment of young and overall cover in the preferred browse community. In addition, improvement could come from diversifying and increasing the cover of perennial grasses and forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-04.6, Table 13B-04.7, Table 13B-04.13, Table 13B-04.15). Pellet group data suggests that deer presence has been high over the course of the study. However, elk presence has remained low over the same period (Table 13B-04.9). Utilization of blackbrush correlates with deer presence, as over 80% of plants sampled in density strips have been moderately to heavily hedged since 2015 (Table 13B-04.13). However, on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 13B-04.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 16.6 | 0.1 | 5.0 | - | - | - |
| 2000 | 14.6 | 0.4 | 4.2 | - | - | - |
| 2005 | 16.2 | 0.4 | 4.4 | 19.8 | 0.2 | 5.2 |
| 2010 | 17.7 | 0.4 | 2.6 | 23.6 | 0.2 | 5.4 |
| 2015 | 14.1 | 0.3 | 9.5 | 20.0 | 0.2 | 7.7 |
| 2020 | 19.9 | 0.1 | 4.5 | 21.1 | 0.4 | 4.8 |
| 2025 | 19.1 | 0.0 | 4.0 | 18.8 | - | 3.7 |

**Table 13B-04.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 411 | 30 | 307 | 13 | 4.5 | 0.5 | 6.7 | 0.0 |
| 2000 | 308 | 59 | 80 | 2 | 2.3 | 0.9 | 0.8 | 0.0 |
| 2005 | 389 | 60 | 282 | 17 | 15.3 | 2.0 | 3.1 | 0.1 |
| 2010 | 379 | 64 | 188 | 26 | 12.8 | 1.1 | 1.1 | 0.3 |
| 2015 | 354 | 64 | 240 | 11 | 6.1 | 1.0 | 2.2 | 0.0 |
| 2020 | 381 | 44 | 94 | 7 | 14.3 | 1.4 | 0.5 | 0.1 |
| 2025 | 406 | 64 | 135 | 1 | 14.5 | 1.3 | 1.2 | 0.0 |

**Table 13B-04.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 25.4 | 15.5 | 23.2 | 0.1 | 11.2 | 33.4 |
| 2000 | 30.5 | 20.1 | 20.7 | 6.6 | 13.4 | 24.5 |
| 2005 | 24.0 | 20.4 | 13.3 | 5.0 | 10.7 | 38.9 |
| 2010 | 25.5 | 13.7 | 39.6 | 3.1 | 11.4 | 34.1 |
| 2015 | 22.6 | 19.2 | 25.4 | 6.0 | 14.3 | 32.7 |
| 2020 | 22.3 | 27.2 | 27.5 | 6.1 | 14.1 | 37.2 |
| 2025 | 29.8 | 13.0 | 33.4 | 3.2 | 11.3 | 35.6 |

**Table 13B-04.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 34 | - | 23 |
| 2000 | - | 29 | - | 11 |
| 2005 | - | 37 | 1 | 24 |
| 2010 | - | 26 | 16 | 14 |
| 2015 | - | 30 | 1 | 21 |
| 2020 | - | 31 | - | 15 |
| 2025 | - | 43 | - | 9 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 43.6 (107.6) | - | - |
| 2005 | - | 79.8 (197.0) | 3.4 (8.3) | - |
| 2010 | 2.9 (7.2) | 102.6 (253.3) | 8.7 (21.5) | - |
| 2015 | - | 37.5 (92.7) | 2.7 (6.6) | - |
| 2020 | 0.7 (1.8) | 57.7 (142.4) | 0.7 (1.7) | - |
| 2025 | - | 58.3 (144.0) | 0.7 (1.7) | - |

**Table 13B-04.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | - | 3 | 411 | - | 4 | - | 23 | - | - | - |
| 2000 | 6 | 7 | 308 | - | - | - | 12 | 34 | - | 25 |
| 2005 | - | - | 379 | 1 | - | - | - | 59 | - | 39 |
| 2010 | - | - | 377 | - | - | - | 26 | 39 | - | 16 |
| 2015 | 1 | - | 354 | - | - | - | 1 | 60 | 2 | 6 |
| 2020 | 1 | - | 381 | 2 | - | - | 3 | 38 | - | 10 |
| 2025 | 1 | - | 406 | 0 | - | 1 | - | 63 | - | 11 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | - | 0.3 | 4.5 | - | 0.0 | - | 0.1 | - | - | - |
| 2000 | 0.0 | 0.1 | 2.2 | - | - | - | 0.1 | 0.7 | - | 0.1 |
| 2005 | - | - | 14.8 | 0.0 | - | - | - | 2.0 | - | 0.4 |
| 2010 | - | - | 12.8 | - | - | - | 0.3 | 0.8 | - | 0.0 |
| 2015 | 0.1 | - | 6.1 | - | - | - | 0.0 | 0.9 | 0.0 | 0.0 |
| 2020 | 0.0 | - | 14.3 | 0.0 | - | - | 0.1 | 1.1 | - | 0.0 |
| 2025 | 0.1 | - | 14.5 | 0.0 | - | 0.0 | - | 1.1 | - | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-04.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Astragalus nuttallianus[a] (smallflowered milkvetch) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis stevioides[a] (Esteve's pincushion) | Chamaesyce (sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cryptantha gracilis[a] (narrowstem cryptantha) | Cymopterus (springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Erigeron (fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Gilia inconspicua[a] (shy gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium lasiocarpum[a] (shaggyfruit pepperweed) | Mentzelia[a] (blazingstar) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 290 | - | - | - | - | - | 2 | - | - | - | 13 | 1 | 19 | 14 | 3 | 15 | - |
| 2000 | - | 1 | - | - | - | - | - | 1 | - | - | 33 | - | 22 | 11 | - | - | 21 |
| 2005 | 200 | 5 | - | 13 | - | - | 15 | 1 | 8 | - | 17 | - | 46 | 92 | 5 | 8 | 46 |
| 2010 | 25 | 6 | 2 | - | - | 2 | 3 | 9 | 5 | - | 22 | - | 90 | 28 | 11 | - | 51 |
| 2015 | 82 | - | - | - | 3 | - | - | 2 | - | 3 | 92 | - | 131 | 2 | 5 | - | - |
| 2020 | 30 | - | 12 | - | - | - | - | 4 | 3 | - | - | - | 31 | 7 | 2 | - | 16 |
| 2025 | 2 | - | 1 | - | - | - | - | 1 | - | - | - | - | 132 | 5 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 6.3 | - | - | - | - | - | 0.0 | - | - | - | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | - |
| 2000 | - | 0.0 | - | - | - | - | - | 0.0 | - | - | 0.1 | - | 0.1 | 0.6 | - | - | 0.0 |
| 2005 | 1.5 | 0.0 | - | 0.2 | - | - | 0.0 | 0.0 | 0.0 | - | 0.1 | - | 0.4 | 0.5 | 0.0 | 0.0 | 0.4 |
| 2010 | 0.1 | 0.1 | 0.0 | - | - | 0.0 | 0.0 | 0.1 | 0.1 | - | 0.1 | - | 0.7 | 0.1 | 0.0 | - | 0.2 |
| 2015 | 0.7 | - | - | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.4 | - | 1.0 | 0.0 | 0.0 | - | - |
| 2020 | 0.3 | - | 0.1 | - | - | - | - | 0.0 | 0.0 | - | - | - | 0.2 | 0.0 | 0.0 | - | 0.0 |
| 2025 | 0.0 | - | 0.0 | - | - | - | - | 0.0 | - | - | - | - | 1.1 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Navarretia intertexta[a] (needleleaf navarretia) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Schoenocrambe linifolia (flaxleaf plainsmustard) | unknown annual forb[a] (unknown forb) | Xylorhiza glabriuscula var. glabriuscula (smooth woodyaster) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 1995 | - | 11 | 8 | 1 | 2 | - | - |
| 2000 | 8 | - | - | - | - | - | - |
| 2005 | 9 | 3 | 4 | - | - | - | - |
| 2010 | - | - | 3 | - | - | 7 | 2 |
| 2015 | - | 4 | 7 | - | - | 2 | - |
| 2020 | - | - | - | - | - | - | - |
| 2025 | - | - | - | - | - | - | - |
| year | Average Cover (%) | | | | | | |
| 1995 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - |
| 2000 | 0.0 | - | - | - | - | - | - |
| 2005 | 0.0 | 0.0 | 0.0 | - | - | - | - |
| 2010 | - | - | 0.0 | - | - | 0.0 | 0.0 |
| 2015 | - | 0.0 | 0.0 | - | - | 0.0 | - |
| 2020 | - | - | - | - | - | - | - |
| 2025 | - | - | - | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-04.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Coleogyne ramosissima[p] (blackbrush) | Ephedra viridis[p] (mormon tea) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Sclerocactus (fishhook cactus) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | - | 18.7 | - | 1.1 | - | 5.2 | 0.2 | - | - |
| 2010 | - | 21.1 | 0.4 | 2.1 | - | 5.4 | 0.2 | - | - |
| 2015 | 0.2 | 18.6 | - | 1.2 | 0.2 | 7.7 | 0 | - | - |
| 2020 | 0.1 | 19.6 | 0.1 | 1.3 | 0.1 | 4.8 | 0.3 | - | - |
| 2025 | - | 17 | 0.2 | 1.6 | - | 3.7 | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 1995 | - | 16.6 | - | - | 0.0 | 4.6 | 0.0 | 0.4 | - |
| 2000 | 0.8 | 13.4 | - | 0.4 | 0.1 | 4.2 | 0.1 | - | 0.1 |
| 2005 | 0.0 | 14.8 | 0.5 | 0.9 | - | 4.4 | 0.4 | - | - |
| 2010 | 0.4 | 15.5 | 0.2 | 1.6 | - | 2.6 | 0.4 | - | - |
| 2015 | 0.9 | 12.1 | - | 1.1 | 0.1 | 9.5 | 0.2 | - | - |
| 2020 | 0.1 | 18.1 | 0.0 | 1.6 | 0.0 | 4.5 | 0.1 | 0.0 | - |
| 2025 | - | 17.4 | 0.0 | 1.7 | - | 4.0 | 0.0 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-04.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 40 | - | 0 | 50 | 50 | 50 | 0 | 0 | 63/103 |
| 2000 | 100 | - | 20 | 80 | 0 | 20 | 40 | 0 | 68/112 |
| 2005 | 40 | - | 50 | 50 | 0 | 50 | 50 | 0 | 71/90 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 62/90 |
| 2015 | 60 | - | 0 | 33 | 67 | 0 | 100 | 33 | 53/78 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | 58/87 |
| 2025 | 20 | - | 0 | 0 | 100 | 100 | 0 | 100 | - / - |
| Bassia prostrata[pi] -- (forage kochia) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 17/9 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Coleogyne ramosissima[p] -- (blackbrush) | | | | | | | | | |
| 1995 | 4560 | - | 3 | 94 | 4 | 20 | 2 | 1 | 41/75 |
| 2000 | 4280 | 20 | 2 | 94 | 5 | 12 | 0 | 1 | 39/73 |
| 2005 | 4460 | 240 | 2 | 86 | 12 | 21 | 0 | 3 | 40/78 |
| 2010 | 3380 | 80 | 4 | 92 | 5 | 17 | 0 | 1 | 39/86 |
| 2015 | 3680 | - | 5 | 85 | 10 | 63 | 23 | 15 | 37/75 |
| 2020 | 4080 | - | 3 | 48 | 50 | 46 | 36 | 48 | 40/74 |
| 2025 | 4880 | - | 1 | 73 | 27 | 32 | 58 | 30 | - / - |
| Echinocereus coccineus -- (scarlet hedgehog cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 25/66 |
| 2015 | - | - | - | - | - | - | - | - | 18/31 |
| 2020 | - | - | - | - | - | - | - | - | 10/17 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[p] -- (mormon tea) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 67/84 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 66/108 |
| 2005 | 220 | - | 46 | 55 | 0 | 55 | 0 | 0 | 88/118 |
| 2010 | 80 | - | 50 | 50 | 0 | 0 | 75 | 25 | 80/109 |
| 2015 | - | - | - | - | - | - | - | - | 52/87 |
| 2020 | 60 | - | 0 | 100 | 0 | 0 | 67 | 0 | 51/58 |
| 2025 | 180 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. speciosa[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 38/107 |
| 2005 | - | - | - | - | - | - | - | - | 48/109 |
| 2010 | - | - | - | - | - | - | - | - | 50/109 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 59/149 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 59/121 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 66/132 |
| 2015 | 120 | 40 | 0 | 100 | 0 | 100 | 0 | 0 | 56/113 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 73/127 |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/28 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/32 |
| 2005 | - | - | - | - | - | - | - | - | 25/29 |
| 2010 | - | - | - | - | - | - | - | - | 26/38 |
| 2015 | 380 | - | 47 | 47 | 5 | 0 | 0 | 0 | 18/23 |
| 2020 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 15/12 |
| 2025 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | 20 | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| 2010 | 40 | - | 50 | 50 | 0 | 0 | 0 | 50 | - / - |
| 2015 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 60 | - | 0 | 67 | 33 | 0 | 0 | 33 | - / - |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia macrorhiza -- (twistspine pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 25/60 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/74 |
| 2000 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/62 |
| 2005 | 160 | - | 0 | 38 | 63 | 0 | 0 | 63 | 17/67 |
| 2010 | 100 | - | 0 | 40 | 60 | 0 | 0 | 0 | 12/47 |
| 2015 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/36 |
| 2020 | 200 | - | 0 | 70 | 30 | 0 | 0 | 100 | 13/35 |
| 2025 | 100 | - | 0 | 60 | 40 | 0 | 0 | 40 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/9 |
| 2000 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/13 |
| 2005 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/18 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/17 |
| 2015 | 100 | - | 0 | 100 | 0 | 0 | 40 | 40 | 15/16 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/17 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-04.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

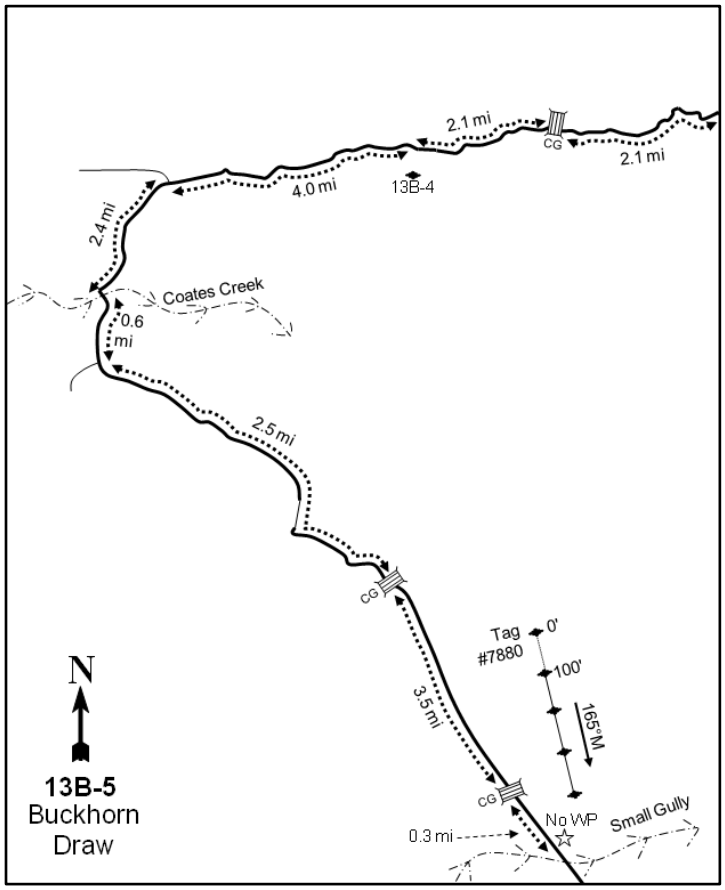
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 21 | - | - | - | - | - | 12.9 |
| 2000 | 29 | - | - | - | - | - | 27.4 |
| 2005 | 33 | - | 14 | 36 | 36 | 14 | 24.2 |
| 2010 | 21 | - | - | 50 | 42 | 8 | 17.8 |
| 2015 | 21 | - | - | 38 | 54 | 8 | 28.8 |
| 2020 | 21 | - | - | 33 | 67 | - | 33.8 |
| 2025 | 18 | - | - | 33 | 67 | - | 27.3 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 8 | - | - | - | - | - | 6.8 |
| 2000 | 4 | - | - | - | - | - | 16.0 |
| 2010 | 7 | - | - | 60 | 20 | 20 | 14.4 |
| 2015 | 5 | - | - | 50 | 25 | 25 | 16.3 |
| 2020 | 4 | - | - | 67 | 33 | - | 13.0 |
| 2025 | 5 | - | - | 25 | 75 | - | 21.0 |

**Table 13B-04.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 16.6 | 13.9 | 1.3 | 1.0 | -3.4 | 0.1 | 0.0 | **29.5** | Fair |
| 2000 | 14.8 | 13.8 | 1.4 | 1.8 | -1.7 | 0.0 | 0.0 | **30.1** | Fair |
| 2005 | 19.8 | 11.5 | 0.9 | 4.0 | -11.5 | 0.1 | 0.0 | **24.8** | Poor-Fair |
| 2010 | 23.7 | 13.8 | 2.0 | 2.2 | -9.6 | 0.6 | 0.0 | **32.7** | Fair |
| 2015 | 20.1 | 12.0 | 2.3 | 2.0 | -4.6 | 0.1 | 0.0 | **31.9** | Fair |
| 2020 | 21.2 | 1.0 | 1.2 | 2.7 | -10.7 | 0.2 | 0.0 | **15.6** | Poor |
| 2025 | 18.9 | 7.8 | 0.4 | 2.5 | -10.9 | 0.0 | 0.0 | **18.7** | Poor |

# BUCKHORN DRAW - STUDY NO. 13B-5




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Blue Chief Mesa NE; Township 23S, Range 25E, Section 03 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 660872 East 4300577 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7880 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Utah-Colorado state line west of Glade Park, travel 2.1 miles to a cattle guard. Continue west for 2.1 miles to the Red Cliffs transect (13B-04). Proceed west on the main road for 4.0 miles to a fork. Stay left and go 2.4 miles to Coates Creek. Cross the creek and continue 0.6 miles to a fork. Stay left and continue 2.5 miles to a cattle guard. Proceed 3.5 miles to another cattle guard. Go 0.3 miles past the cattle guard and stop; the transect is on the left (east) side of the road. The 0-foot end of the baseline (found 400 feet north) is marked by a fence post that is tagged with browse tag #7880. All other plot markers are short rebar stakes.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | SCHARF MESA |
| Elevation | 5,100ft (1,554m) |
| Aspect | North |
| Slope | 4% |
| Sample Dates | 06/06/1995, 05/23/2000, 05/26/2005, 05/27/2010, 05/19/2015, 05/20/2020, 05/21/2025 |

## Wildlife Habitat and Vegetation History

**Table 13B-05.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-05.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Broom Snakeweed | Early Phase I |
| 1995 | Broom Snakeweed/Spiny Hopsage | Early Phase I |
| 2000 | Perennial Grass/Mixed Shrub | Early Phase I |
| 2005 | Annual Grass/Mixed Shrub | Early Phase I |
| 2010 | Annual Grass/Mixed Shrub | Early Phase I |
| 2015 | Annual-Perennial Grass/Mixed Shrub | Early Phase I |
| 2020 | Annual Grass/Mixed Shrub | Early Phase I |
| 2025 | Annual Grass/Mixed Shrub | Early Phase I |

## Site Notes

No Notes

## Soils

**Table 13B-05.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.6 | 64.0 | 18.0 | 18.0 | 0.3 | 2.3 | 99.2 | 0.6 | 05/23/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 11 inches |
| NRCS Ecological Site | Semidesert Sandy Loam (Blackbrush) |
| NRCS Ecological Site # | R035XY218UT |
| States and Transitions | 1986-1995 - Current Potential State: Community Phase 2.5<br>2000-2025 - Current Potential State: Community Phase Undefined |

Broom snakeweed (*Gutierrezia sarothrae*) and spiny hopsage (*Grayia spinosa*) have dominated the shrub component on this site since study establishment in 1986; other species such as Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and blackbrush (*Coleogyne ramosissima*) have also been present to a lesser extent (Photos, Pre-1992 Data, Table 13B-05.12, Table 13B-05.13). The introduced annual grass species cheatgrass (*Bromus tectorum*) has provided much of the herbaceous cover and has been a co-dominant site component in most sample years. However, the native perennial grass species sand dropseed (*Sporobolus cryptandrus*) dominated the understory in 2000 and was co-dominant in 2015. Forbs have remained rare, with the introduced annual species redstem stork's bill (*Erodium cicutarium*) contributing most of the forb cover in recent sample years (Table 13B-05.7, Table 13B-05.10, Table 13B-05.11). Utah juniper (*Juniperus osteosperma*) has been observed on site throughout the duration of the study. Although there may be potential for further encroachment in future sample years, this is likely not an immediate threat as the site has remained within Early Phase I of woodland succession since 1986 (Table 13B-05.4).

Deer winter range condition on this site has remained between very poor and very poor-poor since 1995. Improvements to deer winter range could be achieved by increasing cover and recruitment of preferred browse plants to the community. In addition, improvement could come from diversifying and increasing the cover of perennial forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-05.6, Table 13B-05.7, Table 13B-05.13, Table 13B-05.15). Pellet group data suggests that deer presence has ranged between low and high since 1995, and deer presence was at its highest in 2025. Elk presence has remained low to absent over the same period. Utilization of the limited sagebrush population has remained high since 2015; 97% of sagebrush plants sampled in density strips were heavily hedged in the most recent sample year (Table 13B-05.13). Cattle presence has varied widely from low to high (Table 13B-05.9). However, on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 13B-05.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 4.6 | 4.0 | - | - | - | - |
| 2000 | 7.9 | 1.9 | - | - | - | - |
| 2005 | 6.0 | 0.7 | - | 5.3 | 0.3 | - |
| 2010 | 7.1 | 2.3 | 0.1 | 6.8 | 0.9 | - |
| 2015 | 6.4 | 1.2 | - | 6.0 | 1.5 | 0.3 |
| 2020 | 6.0 | 1.4 | 0.2 | 6.2 | 0.7 | 1.5 |
| 2025 | 6.4 | 2.3 | 0.7 | 5.6 | 2.6 | 1.2 |

**Table 13B-05.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 439 | 221 | 175 | 58 | 4.1 | 7.3 | 0.4 | 0.2 |
| 2000 | 274 | 246 | 44 | 22 | 2.7 | 10.4 | 0.1 | 0.0 |
| 2005 | 473 | 31 | 192 | 42 | 38.2 | 0.2 | 1.3 | 0.2 |
| 2010 | 405 | 122 | 183 | 32 | 19.3 | 3.8 | 1.8 | 0.4 |
| 2015 | 447 | 320 | 368 | 9 | 12.6 | 11.6 | 4.5 | 0.1 |
| 2020 | 452 | 52 | 187 | 10 | 18.3 | 0.9 | 2.1 | 0.1 |
| 2025 | 371 | 46 | 224 | - | 7.4 | 0.8 | 2.7 | - |

**Table 13B-05.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 33.0 | 2.1 | 25.5 | - | - | 24.6 |
| 2000 | 54.4 | 5.0 | 24.7 | 0.0 | - | 23.6 |
| 2005 | 34.1 | 9.4 | 20.3 | 0.0 | - | 45.3 |
| 2010 | 38.6 | 8.7 | 38.3 | - | - | 35.9 |
| 2015 | 31.2 | 17.3 | 31.7 | 0.0 | - | 36.7 |
| 2020 | 25.7 | 26.5 | 38.2 | 0.0 | - | 27.5 |
| 2025 | 50.8 | 12.1 | 32.1 | 0.0 | - | 19.6 |

**Table 13B-05.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 5 | 28 | 2 | 21 |
| 2000 | 9 | 23 | 1 | 19 |
| 2005 | 23 | 21 | 2 | 30 |
| 2010 | 12 | 24 | 5 | 30 |
| 2015 | 8 | 17 | - | 70 |
| 2020 | 6 | 28 | - | 47 |
| 2025 | 5 | 52 | 4 | 44 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 19.6 (48.4) | 26.8 (66.2) | 1.3 (3.3) | - |
| 2005 | 29.0 (71.7) | 20.1 (49.7) | 3.4 (8.3) | - |
| 2010 | 46.5 (114.8) | 26.2 (64.6) | 2.7 (6.6) | - |
| 2015 | 2.9 (7.2) | 24.1 (59.6) | - | - |
| 2020 | 12.3 (30.5) | 38.2 (94.4) | - | - |
| 2025 | 6.5 (16.1) | 44.9 (110.9) | - | - |

**Table 13B-05.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1995 | 37 | 76 | 438 | 156 | 23 |
| 2000 | 34 | 80 | 274 | 177 | 18 |
| 2005 | 7 | - | 473 | 27 | 36 |
| 2010 | 8 | - | 403 | 115 | 19 |
| 2015 | 23 | 14 | 446 | 313 | 70 |
| 2020 | 8 | 4 | 451 | 42 | 65 |
| 2025 | 5 | - | 370 | 43 | 24 |
| year | Average Cover (%) | | | | |
| 1995 | 0.2 | 2.4 | 4.1 | 4.6 | 0.0 |
| 2000 | 0.5 | 3.2 | 2.6 | 6.8 | 0.1 |
| 2005 | 0.0 | - | 38.2 | 0.2 | 0.1 |
| 2010 | 0.1 | - | 19.3 | 3.7 | 0.1 |
| 2015 | 0.6 | 0.2 | 12.2 | 10.8 | 0.4 |
| 2020 | 0.2 | 0.0 | 18.1 | 0.7 | 0.2 |
| 2025 | 0.2 | - | 7.3 | 0.6 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-05.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Calochortus nuttallii (sego lily) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Draba[a] (draba) | Eriogonum (buckwheat) | Erodium cicutarium[ai] (redstem stork's bill) | Gilia inconspicua[a] (shy gilia) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium lasiocarpum[a] (shaggyfruit pepperweed) | Lygodesmia grandiflora (largeflower skeletonplant) | Navarretia intertexta[a] (needleleaf navarretia) | Plantago patagonica[a] (woolly plantain) | Salsola tragus[ai] (prickly Russian thistle) | Sphaeralcea coccinea (scarlet globemallow) | Sphaeralcea parvifolia (smallflower globemallow) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 1995 | - | - | 25 | 6 | - | 16 | 6 | - | - | 38 | 7 | - | 160 | - | 20 | - |
| 2000 | - | 5 | - | 14 | - | - | 12 | 3 | 1 | 3 | 3 | - | 32 | - | - | - |
| 2005 | - | - | 1 | 36 | - | - | 18 | - | - | 60 | 3 | 1 | 164 | - | 3 | - |
| 2010 | - | 2 | 3 | 19 | - | - | 82 | 9 | 5 | 19 | - | - | 95 | - | 5 | 6 |
| 2015 | - | - | - | 1 | 11 | - | 157 | - | - | 19 | - | 11 | 300 | 2 | 5 | 3 |
| 2020 | 31 | - | - | 10 | - | - | 174 | - | 1 | - | - | 7 | - | - | - | - |
| 2025 | 45 | - | - | - | - | - | 218 | - | - | - | - | - | 1 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.1 | 0.0 | - | 0.0 | 0.0 | - | - | 0.1 | 0.0 | - | 0.3 | - | 0.1 | - |
| 2000 | - | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.1 | - | - | - |
| 2005 | - | - | 0.0 | 0.1 | - | - | 0.6 | - | - | 0.2 | 0.1 | 0.0 | 0.5 | - | 0.0 | - |
| 2010 | - | 0.0 | 0.0 | 0.2 | - | - | 1.2 | 0.0 | 0.0 | 0.0 | - | - | 0.6 | - | 0.0 | 0.2 |
| 2015 | - | - | - | 0.0 | 0.0 | - | 1.2 | - | - | 0.0 | - | 0.0 | 3.1 | 0.0 | 0.1 | 0.0 |
| 2020 | 0.1 | - | - | 0.1 | - | - | 2.0 | - | 0.0 | - | - | 0.0 | - | - | - | - |
| 2025 | 0.1 | - | - | - | - | - | 2.6 | - | - | - | - | - | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-05.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Cologyne ramosissima[p] (blackbrush) | Grayia spinosa[p] (spiny hopsage) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) |
|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - |
| 2005 | 0.3 | 1.4 | 3.6 | 0.1 | - | 0.2 |
| 2010 | 0.5 | 1.4 | 4.9 | 0.2 | - | 0.7 |
| 2015 | 0.7 | 1.4 | 3.9 | 0.6 | 0.3 | 0.9 |
| 2020 | 0.8 | 0.9 | 4.5 | 0.3 | 1.5 | 0.4 |
| 2025 | 0.8 | 0.9 | 3.9 | 2.1 | 1.2 | 0.5 |
| year | Quadrat Cover (%) | | | | | |
| 1995 | 0.8 | - | 3.7 | 3.9 | - | 0.1 |
| 2000 | 1.6 | 1.6 | 4.7 | 1.6 | - | 0.3 |
| 2005 | 1.0 | 1.0 | 3.9 | 0.4 | - | 0.3 |
| 2010 | 1.9 | 1.0 | 4.2 | 0.9 | 0.1 | 1.4 |
| 2015 | 1.4 | 1.0 | 4.0 | 0.5 | 0.0 | 0.7 |
| 2020 | 0.9 | 1.4 | 3.7 | 0.4 | 0.2 | 0.9 |
| 2025 | 1.4 | 1.2 | 3.8 | 1.8 | 0.7 | 0.5 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-05.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 1020 | 200 | 33 | 55 | 12 | 47 | 6 | 8 | 38/58 |
| 2000 | 1160 | - | 16 | 76 | 9 | 24 | 9 | 2 | 43/55 |
| 2005 | 660 | - | 21 | 39 | 39 | 30 | 55 | 15 | 38/52 |
| 2010 | 500 | - | 48 | 40 | 12 | 16 | 12 | 4 | 41/66 |
| 2015 | 520 | 80 | 0 | 96 | 4 | 12 | 89 | 15 | 39/60 |
| 2020 | 540 | - | 0 | 56 | 44 | 7 | 89 | 44 | 40/70 |
| 2025 | 600 | - | 3 | 57 | 40 | 0 | 97 | 40 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 45/90 |
| 2005 | - | - | - | - | - | - | - | - | 33/38 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 33/55 |
| 2020 | - | - | - | - | - | - | - | - | 42/80 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Coleogyne ramosissima[p] -- (blackbrush) | | | | | | | | | |
| 1995 | 60 | - | 33 | 67 | 0 | 33 | 0 | 0 | 62/130 |
| 2000 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | 56/103 |
| 2005 | 120 | - | 17 | 83 | 0 | 17 | 0 | 0 | 55/111 |
| 2010 | 100 | - | 20 | 80 | 0 | 20 | 0 | 0 | 52/121 |
| 2015 | 120 | - | 17 | 83 | 0 | 33 | 17 | 17 | 48/103 |
| 2020 | 120 | - | 17 | 67 | 17 | 33 | 0 | 17 | 47/104 |
| 2025 | 100 | - | 0 | 60 | 40 | 40 | 0 | 40 | - / - |
| Ephedra viridis[p] -- (mormon tea) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 68/68 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 63/79 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 70/85 |
| 2020 | - | - | - | - | - | - | - | - | 62/79 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 14/35 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 41/55 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 1995 | 880 | - | 0 | 68 | 32 | 66 | 11 | 27 | 43/84 |
| 2000 | 1020 | - | 0 | 12 | 88 | 2 | 29 | 24 | 43/81 |
| 2005 | 820 | - | 0 | 51 | 49 | 34 | 7 | 20 | 49/82 |
| 2010 | 740 | - | 3 | 92 | 5 | 38 | 11 | 5 | 49/92 |
| 2015 | 840 | - | 0 | 71 | 29 | 38 | 10 | 31 | 52/88 |
| 2020 | 780 | - | 0 | 26 | 74 | 21 | 10 | 69 | 55/92 |
| 2025 | 840 | - | 0 | 55 | 45 | 31 | 55 | 48 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 3260 | 100 | 18 | 82 | 0 | 0 | 0 | 0 | 28/39 |
| 2000 | 4060 | 60 | 17 | 77 | 5 | 0 | 0 | 5 | 15/20 |
| 2005 | 440 | - | 5 | 96 | 0 | 0 | 0 | 0 | 24/25 |
| 2010 | 420 | - | 19 | 76 | 5 | 0 | 0 | 5 | 21/29 |
| 2015 | 2660 | 320 | 59 | 41 | 0 | 0 | 0 | 0 | 19/24 |
| 2020 | 2120 | - | 39 | 57 | 4 | 0 | 1 | 4 | 14/17 |
| 2025 | 1240 | - | 2 | 97 | 2 | 0 | 0 | 2 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 120 | - | 0 | 100 | 0 | 0 | 0 | 33 | 15/39 |
| 2000 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/33 |
| 2005 | 200 | - | 0 | 70 | 30 | 0 | 0 | 30 | 17/59 |
| 2010 | 200 | - | 0 | 80 | 20 | 10 | 0 | 20 | 12/72 |
| 2015 | 660 | - | 0 | 91 | 9 | 0 | 12 | 27 | 14/49 |
| 2020 | 400 | - | 0 | 75 | 25 | 0 | 0 | 45 | 12/66 |
| 2025 | 720 | - | 0 | 61 | 39 | 0 | 0 | 39 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 12/7 |
| 2005 | - | - | - | - | - | - | - | - | 15/19 |
| 2010 | - | - | - | - | - | - | - | - | 18/23 |
| 2015 | - | - | - | - | - | - | - | - | 21/29 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

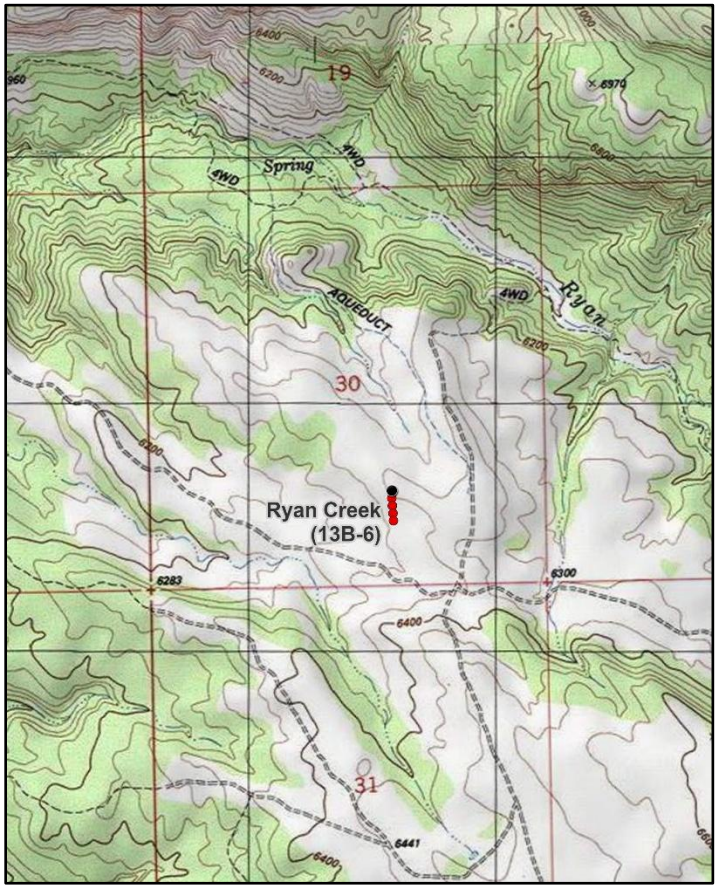
**Table 13B-05.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

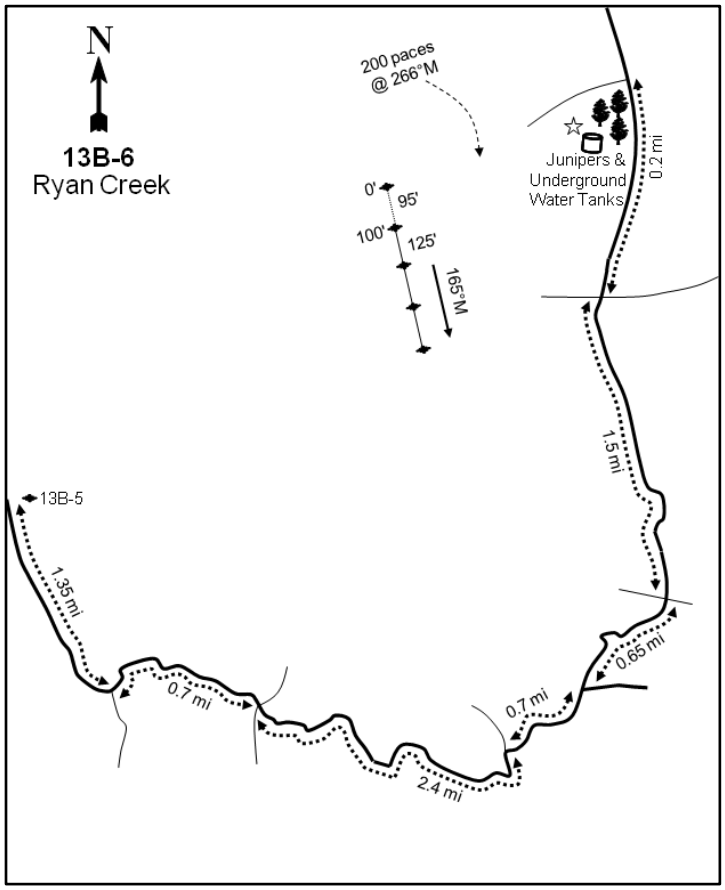
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 18 | - | - | - | - | - | 17.1 |
| 2000 | 18 | - | - | - | - | - | 20.5 |
| 2005 | 14 | - | - | - | - | 100 | 37.0 |
| 2010 | 14 | - | - | 14 | 57 | 29 | 22.6 |
| 2015 | 12 | - | 13 | 25 | 63 | - | 16.3 |
| 2020 | 5 | - | - | - | - | 100 | 41.2 |
| 2025 | 11 | - | - | - | 29 | 71 | 30.4 |

**Table 13B-05.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 4.8 | 0.0 | 0.0 | 14.5 | -3.1 | 0.4 | 0.0 | **16.6** | Poor |
| 2000 | 8.3 | 4.1 | 4.2 | 20.9 | -2.0 | 0.1 | 0.0 | **35.6** | Fair |
| 2005 | 5.4 | 4.4 | 2.8 | 0.4 | -20.0 | 0.5 | 0.0 | **-6.5** | Very Poor |
| 2010 | 6.9 | 13.5 | 4.8 | 7.5 | -14.5 | 0.8 | 0.0 | **19.0** | Poor |
| 2015 | 6.2 | 9.3 | 1.9 | 23.3 | -9.5 | 0.2 | 0.0 | **31.4** | Fair |
| 2020 | 6.4 | -0.9 | 1.2 | 1.9 | -13.7 | 0.1 | 0.0 | **-5.0** | Very Poor |
| 2025 | 5.8 | 1.9 | 0.2 | 1.6 | -5.5 | 0.0 | 0.0 | **4.0** | Very Poor |

# RYAN CREEK - STUDY NO. 13B-6




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steamboat Mesa NW; Township 22S, Range 26E, Section 30 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 666520 East 4302852 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7678 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

At the "Granary" intersection 1.4 miles south of Buckhorn Draw (13B-05) bear left (east) and go 0.7 miles to a fork. Take the middle fork, go 2.4 miles, and turn right at the next fork. Continue 0.7 miles to another fork and turn left. Go 0.7 miles to a cattle guard. Proceed 1.5 miles to a fork. Continue straight (north) and go 0.2 miles to a water development and a few lone junipers on the left. From here, walk up the small ridge 200 paces to the west at 266 degrees magnetic to a full-high fence post with browse tag #7678 attached. The transect runs south from the start of the baseline. All other lines are marked by rebar stakes.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | BUCKHORN |
| Elevation | 6,300ft (1,920m) |
| Aspect | Southwest |
| Slope | 5-10% |
| Sample Dates | 06/06/1995, 05/23/2000, 05/26/2005, 05/27/2010, 05/20/2015, 05/20/2020, 05/20/2025 |

**Table 13B-06.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Plateau | Moab field office Cheatgrass Control | 5573 | November 2023 | 9714 |
| Seeding - Aerial | Moab Cheat grass control and seeding (Proposed) | 7359 | 2025-2026 | 9029 |
| Chaining - Two-Way Unknown | Granite Park Reseeding 1967 | LTDL 4813-13374 | August 1967-May 1968 | 1888 |
| Seeding - Aerial Before | Granite Park Reseeding 1967 | LTDL 4813-13373 | August 1967-May 1968 | 1888 |
| Herbicide - Tebuthiuron | - | - | 1968 | 300 |
| Fire - Wildfire | Ryan Creek | - | 1989 | 3947 |

**Table 13B-06.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| | | | Aerial | Aug 1967 | 1888 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron desertorum | Crested Wheatgrass | | 5.27 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 0.96 | 0.00 |
| S | Artemisia | Sagebrush | | 0.96 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 1.44 | 0.00 |
| S | Purshia | Bitterbrush | | 0.02 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 13B-06.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-06.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Pinyon-Juniper/Perennial Grass | Early Phase I |
| 1995 | Annual Grass | No Encroachment |
| 2000 | Perennial Grass | No Encroachment |
| 2005 | Annual Weed/Annual-Perennial Grass | No Encroachment |
| 2010 | Perennial-Annual Grass | No Encroachment |
| 2015 | Perennial Grass | No Encroachment |
| 2020 | Perennial-Annual Grass | No Encroachment |
| 2025 | Perennial Grass | No Encroachment |

## Site Notes

No Notes

## Soils

**Table 13B-06.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.3 | 64.0 | 15.4 | 20.6 | 4.9 | 7.7 | 80.0 | 1.0 | 05/23/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Upland Shallow Loam (Pinyon/Utah Juniper) |
| NRCS Ecological Site # | R036XY315UT |
| States and Transitions | 1986 - Current Potential State: Community Phase 2.2<br>1995-2025 - Seeded State: Community Phase 4.1 |

Upon study establishment in 1986, this site was dominated by Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) in the overstory and the introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) in the herbaceous understory (Photos, Pre-1992 Data). Following the Ryan Creek Wildfire in 1989 (Table 13B-06.1), the site transitioned to one dominated solely by herbaceous vegetation. Crested wheatgrass and the introduced annual grass species cheatgrass (*Bromus tectorum*) have fluctuated in dominance between sample years. However, a herbicide treatment occurred in November of 2023 (Table 13B-06.1), and crested wheatgrass was the sole dominant vegetation component in 2025 (Table 13B-06.7, Table 13B-06.10, Table 13B-06.11). Shrubs have remained rare throughout the duration of the study (Photos, Table 13B-06.12, Table 13B-06.13).

Deer winter range condition on this site has remained between very poor and very poor-poor since 1995. Improvements to deer winter range could be achieved by increasing recruitment and cover of preferred browse to the community. Additional improvements could

come from diversifying and increasing the cover of perennial forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-06.6, Table 13B-06.7, Table 13B-06.13, Table 13B-06.15). Pellet group data suggests that deer and elk presence has ranged between low and high over the course of the study; deer presence was at its highest in 2025. Cattle presence has varied widely from low to high (Table 13B-06.9). However, on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 13B-06.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 0.1 | 0.5 | - | - | - | - |
| 2000 | 0.1 | 0.5 | - | - | - | - |
| 2005 | 0.8 | 0.2 | - | 1.0 | - | - |
| 2010 | - | 0.0 | - | 0.9 | - | - |
| 2015 | 0.9 | 0.1 | - | 0.9 | - | - |
| 2020 | 1.0 | 0.2 | - | 1.4 | 0.2 | - |
| 2025 | - | 0.6 | - | 0.8 | 0.7 | - |

**Table 13B-06.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 450 | 265 | 227 | 195 | 18.4 | 6.4 | 2.9 | 2.7 |
| 2000 | 156 | 320 | 38 | 76 | 1.7 | 16.8 | 0.4 | 2.5 |
| 2005 | 317 | 268 | 385 | 123 | 9.2 | 9.8 | 16.0 | 4.7 |
| 2010 | 341 | 271 | 253 | 57 | 14.2 | 18.8 | 4.3 | 1.2 |
| 2015 | 119 | 322 | 143 | 79 | 1.1 | 30.1 | 0.7 | 2.2 |
| 2020 | 333 | 266 | 387 | 60 | 12.3 | 19.5 | 5.4 | 1.7 |
| 2025 | 117 | 275 | 163 | 55 | 1.2 | 24.3 | 3.2 | 1.9 |

**Table 13B-06.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 13.1 | 0.6 | 44.8 | 1.1 | 13.3 | 40.9 |
| 2000 | 34.4 | 1.1 | 22.1 | 4.0 | 16.4 | 23.3 |
| 2005 | 30.7 | 0.7 | 21.4 | 1.9 | 17.8 | 35.0 |
| 2010 | 24.2 | 0.9 | 37.0 | 3.0 | 16.0 | 39.4 |
| 2015 | 25.4 | 1.0 | 28.6 | 6.1 | 20.6 | 36.3 |
| 2020 | 24.6 | 1.7 | 38.9 | 4.9 | 18.8 | 39.6 |
| 2025 | 39.0 | 1.3 | 24.3 | 3.7 | 18.6 | 30.1 |

**Table 13B-06.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 3 | 17 | 12 | 6 |
| 2000 | 4 | 29 | 4 | 38 |
| 2005 | 8 | 20 | 12 | 23 |
| 2010 | 6 | 21 | 16 | 8 |
| 2015 | 1 | 23 | 32 | 17 |
| 2020 | 2 | 23 | 16 | 3 |
| 2025 | 1 | 51 | 31 | 28 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 10.2 (25.1) | 20.1 (49.7) | 9.4 (23.2) | - |
| 2005 | 6.5 (16.1) | 27.5 (67.9) | 9.4 (23.2) | - |
| 2010 | 22.5 (55.6) | 59.0 (145.7) | 1.3 (3.3) | - |
| 2015 | 2.9 (7.2) | 16.1 (39.7) | 41.5 (102.6) | - |
| 2020 | 24.7 (61.0) | 42.2 (104.3) | 4.0 (9.9) | - |
| 2025 | 7.2 (17.9) | 66.4 (163.9) | 29.5 (72.8) | - |

**Table 13B-06.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Thinopyrum intermedium[i] (intermediate wheatgrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 13 | 248 | 1 | 450 | 5 | - | 4 | 2 | - | - | - | 3 |
| 2000 | 14 | 297 | 8 | 156 | 5 | - | 9 | - | - | 2 | - | - |
| 2005 | 88 | 218 | - | 317 | - | 0 | 8 | - | - | 2 | - | - |
| 2010 | - | 271 | - | 341 | - | - | 9 | - | 1 | - | - | - |
| 2015 | 8 | 309 | 2 | 119 | - | 5 | 10 | - | 2 | 28 | 5 | - |
| 2020 | 2 | 261 | 2 | 333 | - | - | 12 | 1 | - | - | 3 | - |
| 2025 | 2 | 267 | 6 | 117 | - | - | - | - | - | 4 | 1 | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.6 | 5.6 | 0.0 | 18.4 | 0.0 | - | 0.1 | 0.0 | - | - | - | 0.0 |
| 2000 | 1.1 | 14.6 | 0.2 | 1.7 | 0.2 | - | 0.5 | - | - | 0.1 | - | - |
| 2005 | 0.5 | 9.1 | - | 9.2 | - | 0.0 | 0.2 | - | - | 0.0 | - | - |
| 2010 | - | 18.7 | - | 14.2 | - | - | 0.1 | - | 0.0 | - | - | - |
| 2015 | 0.8 | 27.6 | 0.1 | 1.1 | - | 0.2 | 0.3 | - | 0.0 | 0.3 | 0.6 | - |
| 2020 | 0.3 | 18.4 | 0.0 | 12.3 | - | - | 0.6 | 0.0 | - | - | 0.1 | - |
| 2025 | 0.0 | 23.6 | 0.2 | 1.2 | - | - | - | - | - | 0.2 | 0.4 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-06.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Astragalus mollissimus (woolly locoweed) | Astragalus wingatanus (Fort Wingate milkvetch) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaetopappa ericoides (rose heath) | Chamaesyce fendleri (Fendler's sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chorispora tenella[ai] (crossflower) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba cuneifolia[a] (wedgeleaf draba) | Erigeron (fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Gilia inconspicua[a] (shy gilia) | Heterotheca villosa (hairy false goldenaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 7 | 6 | - | - | 31 | 14 | - | - | - | 3 | - | 6 | - | 136 | - | - |
| 2000 | - | 1 | - | - | - | 43 | 14 | 3 | - | - | 6 | - | 2 | - | 26 | - | - |
| 2005 | - | 7 | 6 | 2 | 56 | 31 | 15 | - | 2 | 8 | 7 | 23 | 118 | 3 | 296 | 34 | 8 |
| 2010 | - | - | - | 3 | 117 | 19 | 9 | - | - | 2 | 2 | 1 | 27 | 10 | 164 | 12 | - |
| 2015 | - | 3 | - | 1 | 3 | 40 | 4 | - | - | - | 2 | 3 | 22 | - | 41 | - | 11 |
| 2020 | 251 | 9 | - | - | 160 | 24 | 3 | - | - | 4 | 4 | - | 17 | - | 96 | 6 | 16 |
| 2025 | 93 | - | - | - | 20 | 29 | 5 | - | - | - | - | 8 | 17 | - | 58 | 2 | 11 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | 0.0 | - | - | 1.5 | 0.0 | - | - | - | 0.0 | - | 0.0 | - | 1.6 | - | - |
| 2000 | - | 0.0 | - | - | - | 0.8 | 0.1 | 0.0 | - | - | 0.0 | - | 0.0 | - | 0.4 | - | - |
| 2005 | - | 0.1 | 0.0 | 0.0 | 0.4 | 1.6 | 0.4 | - | 0.1 | 0.2 | 0.1 | 0.1 | 0.6 | 0.0 | 13.1 | 0.2 | 0.2 |
| 2010 | - | - | - | 0.0 | 1.6 | 0.5 | 0.1 | - | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 1.9 | 0.0 | - |
| 2015 | - | 0.1 | - | 0.0 | 0.0 | 1.4 | 0.1 | - | - | - | 0.0 | 0.0 | 0.1 | - | 0.1 | - | 0.0 |
| 2020 | 2.4 | 0.2 | - | - | 2.1 | 0.7 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.4 | 0.0 | 0.2 |
| 2025 | 1.6 | - | - | - | 0.1 | 1.2 | 0.0 | - | - | - | - | 0.0 | 0.2 | - | 1.1 | 0.0 | 0.4 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium lasiocarpum[a] (shaggyfruit pepperweed) | Machaeranthera canescens (hoary tansyaster) | Medicago sativa[i] (alfalfa) | Phlox longifolia (longleaf phlox) | Salsola tragus[ai] (prickly Russian thistle) | Silene drummondii (Drummond's campion) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Stephanomeria pauciflora (brownplume wirelettuce) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 6 | 5 | - | 140 | 26 | - | 1 | 5 | 161 | - | - | - |
| 2000 | 4 | 3 | - | - | 12 | 4 | - | - | 2 | 4 | - | - |
| 2005 | - | 67 | - | 7 | 37 | - | 47 | 2 | 51 | 5 | - | - |
| 2010 | - | 25 | 54 | - | 7 | - | - | - | 3 | 8 | - | - |
| 2015 | - | 3 | 32 | - | 7 | - | 84 | 1 | 14 | 14 | - | - |
| 2020 | 2 | 9 | - | 2 | 4 | - | 2 | - | 48 | 9 | - | 22 |
| 2025 | - | 30 | - | - | 6 | - | 4 | - | 5 | 4 | 2 | 2 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.0 | 0.0 | - | 0.3 | 0.8 | - | 0.0 | 0.0 | 1.2 | - | - | - |
| 2000 | 0.0 | 0.0 | - | - | 1.6 | 0.0 | - | - | 0.0 | 0.0 | - | - |
| 2005 | - | 0.7 | - | 0.0 | 2.1 | - | 0.1 | 0.0 | 0.8 | 0.0 | - | - |
| 2010 | - | 0.1 | 0.6 | - | 0.2 | - | - | - | 0.0 | 0.2 | - | - |
| 2015 | - | 0.0 | 0.1 | - | 0.3 | - | 0.2 | 0.0 | 0.1 | 0.3 | - | - |
| 2020 | 0.0 | 0.0 | - | 0.0 | 0.4 | - | 0.0 | - | 0.2 | 0.2 | - | 0.2 |
| 2025 | - | 0.2 | - | - | 0.2 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-06.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Opuntia (pricklypear) | Yucca harrimaniae (Spanish bayonet) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 1995 | - | - | - | - |
| 2000 | - | - | - | - |
| 2005 | 1 | - | - | - |
| 2010 | 0.9 | - | - | - |
| 2015 | 0.9 | - | - | - |
| 2020 | 1.4 | - | - | 0.2 |
| 2025 | 0.8 | - | - | 0.7 |
| year | Quadrat Cover (%) | | | |
| 1995 | 0.1 | 0.1 | - | 0.3 |
| 2000 | 0.1 | 0.2 | - | 0.3 |
| 2005 | 0.8 | 0.2 | - | - |
| 2010 | 0.0 | - | 0.0 | - |
| 2015 | 0.9 | - | - | 0.1 |
| 2020 | 1.0 | 0.0 | - | 0.2 |
| 2025 | 0.0 | 0.0 | - | 0.5 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-06.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 72/68 |
| 2000 | - | - | - | - | - | - | - | - | 100/129 |
| 2005 | - | - | - | - | - | - | - | - | 90/131 |
| 2010 | - | - | - | - | - | - | - | - | 70/142 |
| 2015 | - | - | - | - | - | - | - | - | 110/217 |
| 2020 | - | - | - | - | - | - | - | - | 114/189 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 84/206 |
| 2015 | - | - | - | - | - | - | - | - | 86/189 |
| 2020 | - | - | - | - | - | - | - | - | 103/155 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Echinocereus -- (hedgehog cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 28/45 |
| 2015 | - | - | - | - | - | - | - | - | 6/7 |
| 2020 | - | - | - | - | - | - | - | - | 27/48 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 40/43 |
| 2010 | - | - | - | - | - | - | - | - | 52/79 |
| 2015 | - | - | - | - | - | - | - | - | 38/61 |
| 2020 | - | - | - | - | - | - | - | - | 62/87 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 75/116 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 93/160 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 84/128 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 79/147 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 97/180 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 96/156 |
| 2025 | 60 | - | 0 | 67 | 33 | 33 | 0 | 33 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/55 |
| 2000 | 280 | - | 21 | 79 | 0 | 0 | 0 | 0 | 17/55 |
| 2005 | 180 | 20 | 22 | 78 | 0 | 0 | 0 | 0 | 30/49 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 18/45 |
| 2025 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |

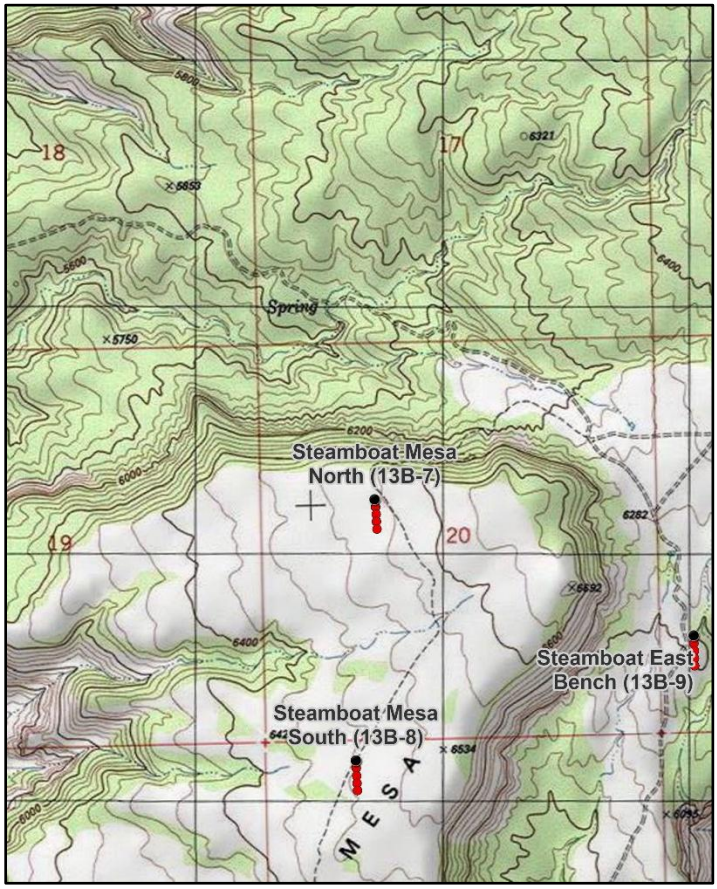
| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 9/28 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 19/22 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Yucca harrimaniae -- (Spanish bayonet) | | | | | | | | | |
| 1995 | 680 | - | 0 | 97 | 3 | 0 | 0 | 0 | 26/36 |
| 2000 | 240 | - | 0 | 42 | 58 | 0 | 0 | 33 | 32/48 |
| 2005 | - | - | - | - | - | - | - | - | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | 15/32 |
| 2020 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 24/38 |
| 2025 | 200 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

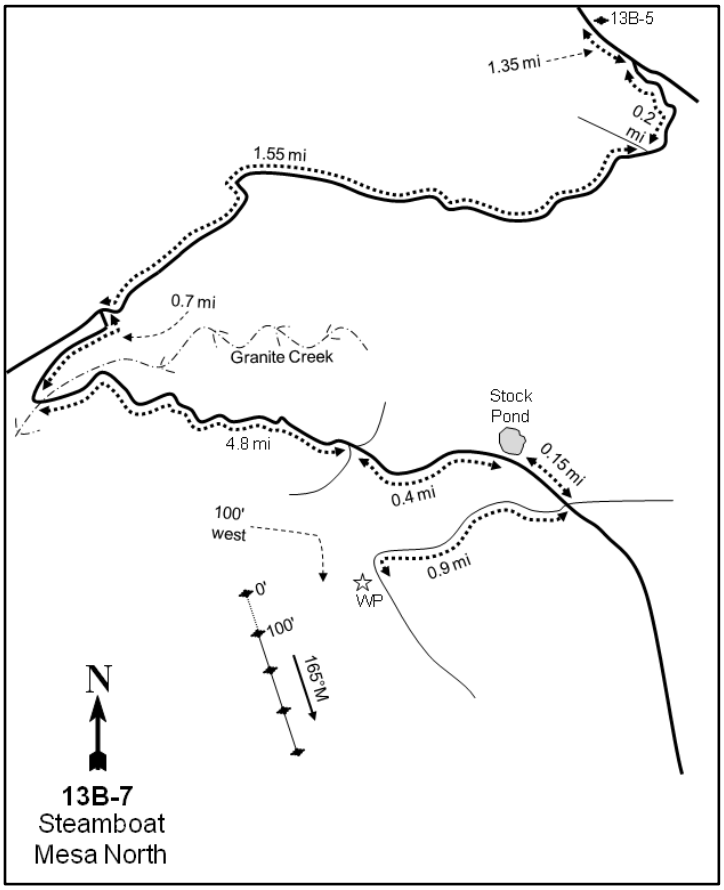
t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-06.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 0.2 | 0.0 | 0.0 | 12.7 | -13.8 | 5.4 | 0.0 | **4.5** | Very Poor |
| 2000 | 0.2 | 0.0 | 0.0 | 30.0 | -1.3 | 5.1 | 0.0 | **34.0** | Very Poor-Poor |
| 2005 | 1.3 | 0.0 | 0.0 | 19.7 | -6.9 | 9.4 | 0.0 | **23.5** | Very Poor |
| 2010 | 1.1 | 0.0 | 0.0 | 30.0 | -10.7 | 2.4 | 0.0 | **22.8** | Very Poor |
| 2015 | 1.1 | 0.0 | 0.0 | 30.0 | -0.8 | 4.4 | 0.0 | **34.7** | Very Poor-Poor |
| 2020 | 1.8 | 0.0 | 0.0 | 30.0 | -9.2 | 3.5 | 0.0 | **26.1** | Very Poor |
| 2025 | 1.0 | 0.0 | 0.0 | 30.0 | -0.9 | 3.8 | 0.0 | **33.9** | Very Poor-Poor |

# STEAMBOAT MESA NORTH - STUDY NO. 13B-7




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steamboat Mesa SW; Township 23S, Range 26E, Section 20 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 666665 East 4295412 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not available |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | No Rebar |

## Directions to Site

From the Buckhorn Draw transect (13B-05), continue southeast for 1.35 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left and drive 1.55 miles to a road on the left. Turn left and go down this road 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then right at another fork which connects back to the main road. After traveling 0.4 miles to a stock pond, continue 0.15 miles to a fork with many branches (the right goes up on Steamboat Mesa). It is 0.9 miles from the fork to the top of Steamboat Mesa and a witness post on the right (west) side of the road. The witness post (a green fence post) is 6 feet off of the road. The 0-foot baseline stake is 100 feet west of the witness post. All of the transect posts are rebar.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | STEAMBOAT MESA |
| Elevation | 6,600ft (2,012m) |
| Aspect | Southwest |
| Slope | 3-5% |
| Sample Dates | 06/01/1995, 09/13/2000, 05/24/2005, 05/25/2010, 05/19/2015, 05/21/2025 |

**Table 13B-07.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial Before | Steamboat Mesa Reseeding 1967 | LTDL 11188-30313 | August-December 1967 | 1352 |
| Chaining - Two-Way Unknown | Steamboat Mesa Reseeding 1967 | LTDL 11188-30312 | August-December 1967 | 1352 |

**Table 13B-07.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| | | | Aerial | Aug 1967 | 1352 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron desertorum | Crested Wheatgrass | | 4.39 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 0.80 | 0.00 |
| S | Artemisia | Sagebrush | | 0.80 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 1.20 | 0.00 |
| S | Purshia | Bitterbrush | | 0.02 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 13B-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Perennial Grass | Phase I |
| 1995 | Pinyon-Juniper/Perennial Grass | Phase I transitioning to Phase II |
| 2000 | Pinyon-Juniper/Perennial Grass | Phase II |
| 2005 | Pinyon-Juniper/Perennial Grass | Phase II |
| 2010 | Pinyon-Juniper/Perennial Grass | Phase II |
| 2015 | Pinyon-Juniper/Perennial Grass | Phase II |
| 2025 | Pinyon-Juniper/Perennial Grass | Phase II |

## Site Notes

This portion of the Steamboat Mesa allotment was two-way chained and seeded in 1967.

## Soils

**Table 13B-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.7 | 53.6 | 25.1 | 21.3 | 1.9 | 8.7 | 92.8 | 0.7 | 09/13/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Upland Loam (Big Sagebrush) |
| NRCS Ecological Site # | R036XY306UT |
| States and Transitions | 1986 - Seeded State: Community Phase 4.1<br>1995-2025 - Pinyon-Utah Juniper State: Community Phase 3.1 |

The seeded perennial grass species crested wheatgrass (*Agropyron cristatum*) has been a dominant vegetation component on this site since study establishment in 1986 (Pre-1992 Data, Table 13B-07.10). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been present in all sample years, and trees became co-dominant with perennial grasses in 1995; the site has been considered to be within Phase II of woodland succession since 2000 (Photos, Table 13B-07.4). Without conifer management, it is predicted that tree encroachment will continue and that the site will progress through the phases of woodland succession. Preferred browse species such as Utah serviceberry (*Amelanchier utahensis*) and mormon tea (*Ephedra viridis*) have also been present on this site, but they have contributed notably less cover than pinyon and juniper (Table 13B-07.12, Table 13B-07.13, Table 13B-07.14). Although the herbaceous understory has consistently remained dominated by crested wheatgrass, the invasive grass species bulbous bluegrass (*Poa bulbosa*) and cheatgrass (*Bromus tectorum*) have been observed with low abundance (Table 13B-07.10, Table 13B-07.11)

Deer winter range condition on this site has remained between poor and very poor since 1995. Improvements to deer winter range could be achieved by increasing recruitment of young and overall cover in the preferred browse community. Further improvement could be attained by diversifying and increasing the cover of perennial forbs. Attention should be given to the presence of annual grass, which decreases the resistance and resilience of the site to disturbance (Table 13B-07.6, Table 13B-07.7, Table 13B-07.13,

Table 13B-07.15). Pellet group data suggests that deer presence has varied between low and high since 2000. Elk presence has remained low over the same period (Table 13B-07.9). As the preferred browse component on this site is limited, however, high utilization of antelope bitterbrush (*Purshia tridentata*) in particular has occurred in many sample years. More specifically, all bitterbrush plants sampled in density strips have been moderately to heavily browsed since 2000. Although bitterbrush density has not decreased overall (Table 13B-07.13), sustained heavy utilization in tandem with continued encroachment by pinyon and juniper could lead to the eventual depletion of the small bitterbrush population on this site and its associated use for wildlife.

## Trend Summary Tables

**Table 13B-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 1.5 | 1.0 | 7.4 | - | - | - |
| 2000 | 1.5 | 1.8 | 8.0 | - | - | - |
| 2005 | 1.5 | 0.5 | 5.7 | 1.5 | 0.4 | 15.8 |
| 2010 | 1.5 | 0.6 | 8.0 | 0.6 | 0.2 | 14.5 |
| 2015 | 2.7 | 0.2 | 7.3 | 3.1 | 0.1 | 16.6 |
| 2025 | 4.0 | 0.1 | 11.3 | 3.9 | 0.3 | 19.6 |

**Table 13B-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 181 | 271 | 186 | 178 | 1.4 | 9.2 | 1.1 | 3.3 |
| 2000 | 3 | 325 | 11 | 86 | 0.0 | 16.3 | 0.4 | 2.1 |
| 2005 | 142 | 290 | 234 | 138 | 2.2 | 18.5 | 3.9 | 3.3 |
| 2010 | 116 | 290 | 153 | 84 | 3.4 | 15.3 | 1.5 | 2.8 |
| 2015 | 64 | 286 | 108 | 75 | 0.3 | 17.7 | 0.6 | 3.1 |
| 2025 | 67 | 268 | 46 | 38 | 0.6 | 19.0 | 0.4 | 0.6 |

**Table 13B-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 33.1 | 0.5 | 37.5 | 0.1 | 4.6 | 26.6 |
| 2000 | 38.4 | 2.3 | 47.0 | 2.5 | 6.1 | 32.8 |
| 2005 | 45.3 | 0.8 | 28.7 | 1.0 | 3.9 | 34.2 |
| 2010 | 33.6 | 1.6 | 38.2 | 2.7 | 3.4 | 31.2 |
| 2015 | 36.7 | 3.1 | 43.7 | 0.6 | 3.3 | 32.4 |
| 2025 | 39.6 | 0.7 | 41.3 | 0.8 | 4.2 | 33.0 |

**Table 13B-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 6 | 19 | 1 | 18 |
| 2000 | 8 | 9 | - | 32 |
| 2005 | 5 | 30 | 5 | 29 |
| 2010 | 3 | 13 | 9 | 14 |
| 2015 | - | 22 | 5 | 38 |
| 2025 | - | 22 | 7 | 11 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 21.8 (53.8) | 42.2 (104.3) | - | - |
| 2005 | 4.4 (10.8) | 61.0 (150.6) | 1.3 (3.3) | - |
| 2010 | 7.2 (17.9) | 53.0 (130.8) | 6.0 (14.9) | - |
| 2015 | 5.8 (14.3) | 25.5 (62.9) | 18.1 (44.7) | - |
| 2025 | 2.2 (5.4) | 48.3 (119.2) | 11.4 (28.1) | - |

**Table 13B-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 16 | 263 | 180 | - | - | - | 4 | 3 | - | 5 |
| 2000 | 0 | 320 | 3 | 2 | 5 | - | - | 11 | 1 | - |
| 2005 | 22 | 277 | 138 | 3 | 1 | 3 | - | 12 | - | 22 |
| 2010 | - | 280 | 116 | - | - | 11 | - | 8 | - | - |
| 2015 | 0 | 285 | 64 | - | - | - | - | 9 | - | - |
| 2025 | - | 252 | 67 | - | - | 14 | - | 3 | 5 | - |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.1 | 9.0 | 1.4 | - | - | - | 0.0 | 0.0 | - | 0.0 |
| 2000 | 0.0 | 16.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - |
| 2005 | 0.4 | 17.7 | 2.1 | 0.1 | 0.0 | 0.2 | - | 0.1 | - | 0.1 |
| 2010 | - | 14.9 | 3.4 | - | - | 0.2 | - | 0.2 | - | - |
| 2015 | 0.0 | 17.6 | 0.3 | - | - | - | - | 0.1 | - | - |
| 2025 | - | 18.5 | 0.6 | - | - | 0.4 | - | 0.1 | 0.1 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Aliciella hutchinsifolia[a] (desert pale gilia) | Allium (onion) | Arabis (rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus mollissimus (woolly locoweed) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Erigeron pumilus (shaggy fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Heterotheca villosa (hairy false goldenaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 0 | 30 | 3 | - | 1 | 7 | 8 | 3 | - | - | 4 | 17 | 4 | 108 | 20 | 8 | 18 |
| 2000 | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | 15 | 11 | 17 |
| 2005 | 1 | 45 | - | - | 9 | 1 | 4 | 44 | 5 | 3 | 2 | 16 | 30 | 95 | - | 25 | 43 |
| 2010 | 3 | 18 | - | - | - | 1 | 7 | 124 | - | - | - | 12 | 5 | 3 | 5 | 5 | 10 |
| 2015 | - | - | 3 | - | 3 | 4 | - | 7 | - | - | - | 1 | 2 | 20 | 1 | 20 | 17 |
| 2025 | 1 | 2 | - | 3 | 0 | - | - | 39 | - | - | - | - | - | - | 1 | - | 0 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | 0.2 |
| 2000 | - | - | - | - | 0.0 | 0.0 | - | - | - | - | - | - | - | - | 0.1 | 0.4 | 0.3 |
| 2005 | 0.0 | 0.2 | - | - | 0.5 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 0.4 | - | 0.5 | 0.8 |
| 2010 | 0.1 | 0.1 | - | - | - | 0.0 | 0.0 | 1.1 | - | - | - | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| 2015 | - | - | 0.0 | - | 0.1 | 0.1 | - | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.5 |
| 2025 | 0.0 | 0.1 | - | 0.0 | 0.0 | - | - | 0.2 | - | - | - | - | - | - | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Penstemon (beardtongue) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Plantago patagonica[a] (woolly plantain) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Silene drummondii (Drummond's campion) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 7 | 47 | 26 | 22 | 3 | 1 | 49 | 35 | 2 | - | 3 | 3 | - | 17 | - | 29 | 14 |
| 2000 | - | - | - | - | 2 | 3 | 37 | 15 | - | - | - | - | - | - | - | - | 12 |
| 2005 | - | 91 | 33 | 6 | - | 1 | 28 | 12 | - | 1 | 35 | 0 | - | 0 | 0 | 5 | 23 |
| 2010 | - | 59 | - | - | - | - | 28 | 12 | - | - | - | - | 1 | 3 | - | - | 9 |
| 2015 | - | 47 | 2 | 0 | - | - | 34 | 10 | 1 | 1 | 29 | - | 8 | 4 | - | - | 6 |
| 2025 | - | 2 | - | - | - | - | 12 | 5 | - | - | - | - | 1 | 1 | - | - | 15 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 2.2 | 0.5 | 0.0 | - | 0.0 | 0.0 | - | 0.1 | - | 0.1 | 0.1 |
| 2000 | - | - | - | - | 0.0 | 0.1 | 1.4 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| 2005 | - | 1.5 | 0.2 | 0.1 | - | 0.0 | 1.1 | 0.1 | - | 0.0 | 0.3 | 0.0 | - | 0.2 | 0.0 | 0.3 | 0.2 |
| 2010 | - | 0.3 | - | - | - | - | 1.7 | 0.3 | - | - | - | - | 0.0 | 0.0 | - | - | 0.1 |
| 2015 | - | 0.2 | 0.0 | 0.0 | - | - | 2.1 | 0.2 | 0.0 | 0.0 | 0.1 | - | 0.0 | 0.0 | - | - | 0.1 |
| 2025 | - | 0.0 | - | - | - | - | 0.4 | 0.0 | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Stenotus acaulis (stemless mock goldenweed) | Streptanthus cordatus (heartleaf twistflower) | Tetraneuris acaulis (stemless four-nerve daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|
| year | Nested Frequency | | | |
| 1995 | 8 | 4 | - | 5 |
| 2000 | 3 | - | - | - |
| 2005 | - | - | 7 | - |
| 2010 | - | 2 | 4 | - |
| 2015 | - | - | - | - |
| 2025 | - | - | 3 | 2 |
| year | Average Cover (%) | | | |
| 1995 | 0.0 | 0.0 | - | 0.0 |
| 2000 | 0.0 | - | - | - |
| 2005 | - | - | 0.2 | - |
| 2010 | - | 0.0 | 0.0 | - |
| 2015 | - | - | - | - |
| 2025 | - | - | 0.1 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Ephedra viridis[p] (mormon tea) | Ericameria nauseosa (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Linanthus pungens (granite prickly phlox) | Opuntia (pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 0.4 | 0.2 | 0.3 | 0.4 | - | 8.6 | - | - | 7.2 | 0.6 |
| 2010 | - | - | 0.2 | 0.1 | - | 0.1 | 6.7 | 0.1 | - | 7.8 | 0.3 |
| 2015 | 1.1 | - | 0.3 | 1.2 | - | - | 10.5 | - | 0.1 | 6.1 | 0.5 |
| 2025 | 1.8 | - | - | 0.9 | - | 0.2 | 11.5 | 0 | 0.1 | 8.1 | 1.2 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | 1.3 | 1.0 | - | 2.7 | 0.0 | 0.0 | 4.8 | 0.1 |
| 2000 | - | 0.4 | 0.0 | 0.9 | 1.6 | 0.0 | 3.7 | 0.2 | 0.0 | 4.4 | 0.3 |
| 2005 | 0.4 | 0.4 | 0.0 | 0.6 | 0.3 | 0.0 | 2.6 | 0.1 | - | 3.1 | 0.2 |
| 2010 | 0.8 | - | 0.0 | 0.6 | - | 0.4 | 4.0 | 0.1 | 0.0 | 4.0 | 0.0 |
| 2015 | 0.9 | 0.1 | 0.0 | 1.2 | 0.2 | 0.0 | 4.1 | 0.0 | 0.0 | 3.2 | 0.5 |
| 2025 | 1.4 | - | - | 1.4 | - | 0.0 | 6.4 | 0.0 | 0.0 | 5.0 | 1.2 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 73/157 |
| 2000 | - | - | - | - | - | - | - | - | 161/192 |
| 2005 | - | - | - | - | - | - | - | - | 87/147 |
| 2010 | - | - | - | - | - | - | - | - | 81/86 |
| 2015 | - | - | - | - | - | - | - | - | 180/263 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/34 |
| 2005 | 20 | - | 0 | 0 | 100 | 0 | 100 | 0 | 19/69 |
| 2010 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 15/37 |
| 2015 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 16/37 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 26/37 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 20/32 |
| 2005 | 20 | - | 0 | 0 | 100 | 0 | 100 | 0 | 34/35 |
| 2010 | - | - | - | - | - | - | - | - | 29/44 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 50 | 34/51 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 96/105 |
| 2000 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 88/173 |
| 2005 | 40 | - | 50 | 0 | 50 | 0 | 50 | 0 | 87/120 |
| 2010 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 48/71 |
| 2015 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 103/139 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 140/82 |
| 2010 | - | - | - | - | - | - | - | - | 104/95 |
| 2015 | - | - | - | - | - | - | - | - | 124/110 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 37/46 |
| 2015 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 38/70 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[p] -- (mormon tea) | | | | | | | | | |
| 1995 | 540 | - | 33 | 56 | 11 | 22 | 7 | 0 | 46/53 |
| 2000 | 400 | - | 5 | 65 | 30 | 15 | 60 | 5 | 49/57 |
| 2005 | 500 | - | 44 | 40 | 16 | 0 | 20 | 8 | 61/97 |
| 2010 | 220 | - | 64 | 36 | 0 | 0 | 0 | 0 | 51/76 |
| 2015 | 460 | - | 4 | 83 | 13 | 48 | 9 | 87 | 51/64 |
| 2025 | 540 | - | 4 | 96 | 0 | 0 | 4 | 0 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 93/112 |
| 2000 | 140 | - | 0 | 86 | 14 | 29 | 0 | 0 | 99/122 |
| 2005 | 120 | - | 0 | 50 | 50 | 17 | 17 | 17 | 66/80 |
| 2010 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | 65/96 |
| 2015 | 60 | - | 0 | 0 | 100 | 0 | 0 | 100 | 107/106 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 19/38 |
| 2000 | 560 | - | 7 | 82 | 11 | 0 | 0 | 4 | 13/23 |
| 2005 | 140 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 25/38 |
| 2010 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 13/20 |
| 2015 | 380 | - | 68 | 32 | 0 | 11 | 0 | 0 | 15/27 |
| 2025 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/29 |
| 2000 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/26 |
| 2005 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/18 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/36 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 25 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 13/46 |
| 2000 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 10/23 |
| 2005 | 60 | - | 33 | 33 | 33 | 0 | 0 | 33 | 10/45 |
| 2010 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/35 |
| 2015 | 100 | - | 20 | 60 | 20 | 0 | 20 | 40 | 10/33 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 20 | - / - |
| 2010 | 100 | - | 20 | 60 | 20 | 0 | 0 | 20 | - / - |
| 2015 | 80 | - | 0 | 100 | 0 | 25 | 0 | 50 | - / - |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/162 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 60/226 |
| 2005 | 140 | - | 0 | 100 | 0 | 0 | 100 | 0 | 36/79 |
| 2010 | 60 | - | 0 | 100 | 0 | 100 | 0 | 0 | 102/105 |
| 2015 | 240 | - | 0 | 83 | 17 | 0 | 100 | 17 | 69/125 |
| 2025 | 180 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

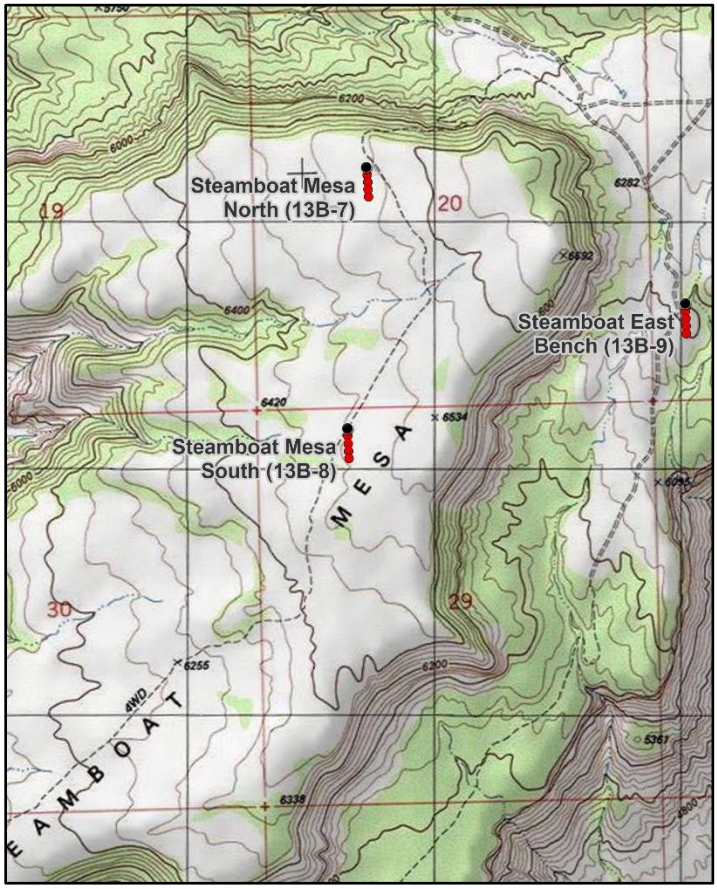
**Table 13B-07.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

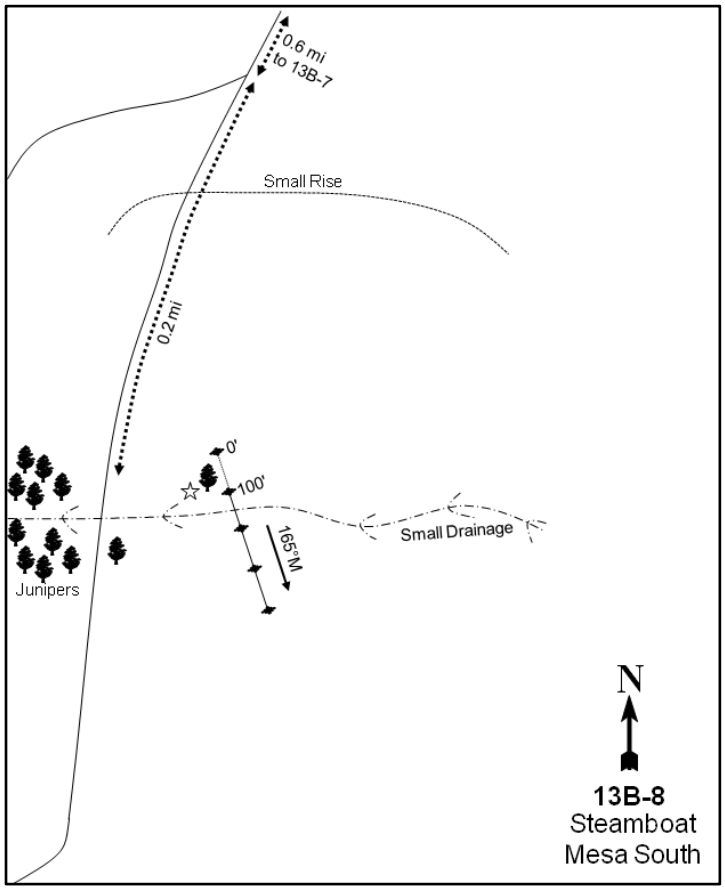
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 144 | - | - | - | - | - | 8.7 |
| 2000 | 142 | - | - | - | - | - | 8.3 |
| 2005 | 161 | - | 5 | 26 | 68 | - | 13.6 |
| 2010 | 134 | - | - | 15 | 70 | 15 | 13.3 |
| 2015 | 137 | - | - | 10 | 65 | 25 | 17.0 |
| 2025 | 148 | - | - | 10 | 25 | 65 | 24.4 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 170 | - | - | - | - | - | 7.3 |
| 2000 | 177 | - | - | - | - | - | 7.3 |
| 2005 | 102 | - | 11 | 68 | 16 | 5 | 10.6 |
| 2010 | 103 | - | 11 | 63 | 26 | - | 8.6 |
| 2015 | 113 | - | 5 | 58 | 32 | 5 | 10.9 |
| 2025 | 49 | - | 6 | 44 | 31 | 19 | 17.3 |

**Table 13B-07.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 1.9 | 0.0 | 0.0 | 18.4 | -1.0 | 6.7 | 0.0 | **26.0** | Very Poor |
| 2000 | 2.0 | 0.0 | 0.0 | 30.0 | 0.0 | 4.2 | 0.0 | **36.2** | Very Poor-Poor |
| 2005 | 2.0 | 0.0 | 0.0 | 30.0 | -1.6 | 6.6 | 0.0 | **37.0** | Very Poor-Poor |
| 2010 | 0.8 | 0.0 | 0.0 | 30.0 | -2.6 | 5.5 | 0.0 | **33.7** | Very Poor-Poor |
| 2015 | 4.3 | 0.0 | 0.0 | 30.0 | -0.3 | 6.2 | 0.0 | **40.2** | Poor |
| 2025 | 5.6 | 0.0 | 0.0 | 30.0 | -0.4 | 1.2 | 0.0 | **36.4** | Very Poor-Poor |

# STEAMBOAT MESA SOUTH - STUDY NO. 13B-8




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steamboat Mesa SW; Township 23S, Range 26E, Section 29 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 666589 East 4294353 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Start from site number 13B-07, Steamboat Mesa North. Continue south on the same road for 0.6 miles to a fork. Proceed straight 0.2 miles (halfway to an exclosure) to a large juniper on the left (east) side of the road in a sagebrush-grass flat. The baseline 0-foot stake is located north of the tree and is not marked with a browse tag.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | STEAMBOAT MESA |
| Elevation | 6,500ft (1,981m) |
| Aspect | Southwest |
| Slope | 4-6% |
| Sample Dates | 06/01/1995, 09/13/2000, 05/24/2005, 05/25/2010, 05/19/2015, 05/21/2020, 05/21/2025 |

**Table 13B-08.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Herbicide - Imazapic | Moab field office Cheatgrass Control | 5573 | November 2024 | 11016 |
| Seeding - Aerial | Moab Cheat grass control and seeding (Proposed) | 7359 | 2025-2026 | 9029 |
| Fire - Wildfire | Steamboat Mesa | - | July 2009 | 172 |

## Wildlife Habitat and Vegetation History

**Table 13B-08.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-08.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 1995 | Annual Grass/Wyoming Big Sagebrush | Early Phase I |
| 2000 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2005 | Annual Grass/Wyoming Big Sagebrush | Phase I |
| 2010 | Annual Grass | Early Phase I |
| 2015 | Annual Grass | Early Phase I |
| 2020 | Annual Grass | Early Phase I |
| 2025 | Bulbous Bluegrass | Early Phase I |

## Site Notes

This site may be an example of a former big sagebrush (*Artemisia tridentata*) park that underwent a conversion to an annual grass type due to livestock use and fire. A large exclosure is located to the south of the study.

## Soils

**Table 13B-08.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 6.9 | 51.6 | 23.1 | 25.3 | 1.4 | 4.9 | 67.2 | 0.5 | 09/13/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Upland Loam (Big Sagebrush) |
| NRCS Ecological Site # | R036XY306UT |
| States and Transitions | 1986 - Current Potential State: Community Phase 2.2<br>1995 - Annual Invaded State: Community Phase 5.1<br>2000 - Current Potential State - Community Phase 2.2<br>2005 - Annual Invaded State: Community Phase 5.1<br>2010-2020 - Annual Invaded State: Community Phase 5.2<br>2025 - State Undefined: Community Phase Undefined |

From study establishment in 1986 through the 2005 sample year, annual and perennial grasses alternated in dominance with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) as a subordinate vegetation component (Pre-1992 Data, Table 13B-08.10, Table 13B-08.12). The introduced annual grass species cheatgrass (*Bromus tectorum*) became the sole dominant component following the 2009 wildfire (Table 13B-08.1) and remained as such through the 2020 sample year. In 2025, however, cheatgrass decreased while the introduced perennial grass bulbous bluegrass (*Poa bulbosa*) increased and became dominant. Although sagebrush has been lost from this community and introduced grasses have dominated, native perennial grasses and forbs have provided moderate amounts of cover following the burn. Should cheatgrass increase again in future years, however, it could increase the risk of reduced ecological resiliency and increased fire frequency (Table 13B-08.7, Table 13B-08.10, Table 13B-08.11). Although density of Utah juniper (*Juniperus osteosperma*) trees has remained low after the fire, their continued presence indicates that there may be potential for infilling in future sample years (Table 13B-08.14). However, the site has been considered to be within Early Phase I of woodland succession in all sample years following the burn (Table 13B-08.4), suggesting that infilling is likely not an immediate concern.

Deer winter range condition on this site has remained very poor since 1995. Improvements to deer winter range could be achieved by reintroducing preferred browse species to the community. In addition, improvement could also come from diversifying and increasing the cover of perennial forbs. Attention should be given to the presence of cheatgrass and bulbous bluegrass, which decreases the resistance and resilience of the site to disturbance (Table 13B-08.6, Table 13B-08.7, Table 13B-08.10, Table 13B-08.13, Table 13B-08.15). Pellet group data suggests that deer presence has varied between low and high since 2000. Elk presence has remained low to moderate over the same period; elk presence was at its highest in 2025. Finally, cattle presence has varied between low and high since 2000 (Table 13B-08.9). Additional on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 13B-08.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 1.5 | - | 1.8 | - | - | - |
| 2000 | 2.3 | - | 1.0 | - | - | - |
| 2005 | 2.6 | - | 0.0 | 3.2 | - | 5.4 |
| 2010 | - | - | - | - | - | 1.9 |
| 2015 | - | - | - | - | - | 2.0 |
| 2020 | - | - | - | - | - | 2.5 |
| 2025 | - | - | - | - | - | 2.4 |

**Table 13B-08.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 458 | 226 | 397 | 227 | 16.0 | 3.0 | 3.8 | 2.1 |
| 2000 | 212 | 332 | 125 | 69 | 3.1 | 19.7 | 0.4 | 0.7 |
| 2005 | 479 | 165 | 360 | 153 | 51.9 | 4.7 | 9.1 | 3.1 |
| 2010 | 371 | 195 | 131 | 251 | 14.7 | 6.2 | 1.3 | 7.1 |
| 2015 | 480 | 216 | 369 | 271 | 30.7 | 14.2 | 7.0 | 8.5 |
| 2020 | 422 | 189 | 134 | 225 | 45.1 | 10.3 | 1.1 | 7.4 |
| 2025 | 220 | 371 | 92 | 112 | 7.1 | 35.8 | 2.3 | 4.2 |

**Table 13B-08.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 14.7 | 2.0 | 60.5 | - | - | 44.0 |
| 2000 | 43.5 | 0.9 | 51.2 | - | - | 29.1 |
| 2005 | 10.3 | 0.1 | 35.8 | - | - | 70.3 |
| 2010 | 38.1 | 0.7 | 37.0 | - | - | 34.8 |
| 2015 | 9.4 | 0.2 | 51.4 | - | - | 63.8 |
| 2020 | 7.5 | 0.5 | 73.3 | - | - | 60.8 |
| 2025 | 27.4 | 0.1 | 39.5 | 0.1 | - | 46.0 |

**Table 13B-08.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | 21 | 18 | - | 5 |
| 2000 | 17 | 33 | - | 41 |
| 2005 | 12 | 6 | 1 | 3 |
| 2010 | 2 | 22 | 4 | 9 |
| 2015 | 2 | 24 | 17 | 2 |
| 2020 | 1 | 4 | 21 | 2 |
| 2025 | 2 | 32 | 30 | 14 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 45.0 (111.2) | 85.8 (211.9) | - | - |
| 2005 | 22.5 (55.6) | 13.4 (33.1) | 2.0 (5.0) | - |
| 2010 | 6.5 (16.1) | 67.7 (167.2) | 14.1 (34.8) | - |
| 2015 | 8.7 (21.5) | 15.4 (38.1) | 28.1 (69.5) | - |
| 2020 | 1.5 (3.6) | 5.3 (13.2) | 10.7 (26.5) | - |
| 2025 | 11.6 (28.7) | 21.5 (53.0) | 36.2 (89.4) | - |

**Table 13B-08.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 1995 | 24 | 8 | 421 | 99 | 57 | - | 16 | 129 | - | 277 |
| 2000 | 8 | - | 207 | 286 | 58 | - | 6 | 60 | 20 | 6 |
| 2005 | 14 | 2 | 475 | 105 | 18 | 8 | 1 | 59 | - | 29 |
| 2010 | 14 | 29 | 366 | 37 | 12 | 33 | 3 | 111 | - | 23 |
| 2015 | 8 | 5 | 480 | 117 | 84 | 23 | 3 | 27 | 15 | 5 |
| 2020 | 39 | 8 | 422 | 15 | 34 | - | - | 113 | 8 | - |
| 2025 | 1 | 5 | 219 | 55 | 34 | 313 | 1 | 4 | 132 | 20 |
| year | Average Cover (%) | | | | | | | | | |
| 1995 | 0.8 | 0.0 | 14.9 | 0.7 | 0.8 | - | 0.1 | 0.7 | - | 1.1 |
| 2000 | 0.2 | - | 3.1 | 16.4 | 1.6 | - | 0.2 | 0.5 | 0.8 | 0.0 |
| 2005 | 0.6 | 0.4 | 51.5 | 2.5 | 0.3 | 0.2 | 0.0 | 0.8 | - | 0.4 |
| 2010 | 0.2 | 0.8 | 14.6 | 1.2 | 0.1 | 1.5 | 0.0 | 2.4 | - | 0.1 |
| 2015 | 0.4 | 0.4 | 30.7 | 7.0 | 4.3 | 0.3 | 0.0 | 0.7 | 1.2 | 0.0 |
| 2020 | 1.9 | 0.8 | 45.1 | 0.1 | 0.5 | - | - | 6.8 | 0.3 | - |
| 2025 | 0.0 | 0.7 | 7.1 | 3.4 | 2.0 | 23.2 | 0.0 | 0.0 | 6.5 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-08.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Aliciella hutchinsifolia[a] (desert pale gilia) | Astragalus (milkvetch) | Astragalus mollissimus (woolly locoweed) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaetopappa ericoides (rose heath) | Cryptantha[a] (annual cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Erigeron pumilus (shaggy fleabane) | Erodium cicutarium[ai] (redstem stork's bill) | Grindelia squarrosa (curlycup gumweed) | Hedysarum (sweetvetch) | Heterotheca villosa (hairy false goldenaster) | Lactuca serriola[ai] (prickly lettuce) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 35 | - | 30 | 59 | 3 | 10 | - | 7 | - | 18 | 0 | - | 1 | 6 | - | 31 |
| 2000 | - | 2 | - | - | - | - | 13 | - | - | - | 55 | 12 | 18 | - | - | - | - |
| 2005 | - | 1 | - | 15 | 14 | - | 7 | - | - | 6 | - | - | 3 | - | - | - | 2 |
| 2010 | - | 30 | 4 | 14 | 86 | 7 | - | - | 10 | 2 | 14 | 31 | 17 | - | - | 3 | 9 |
| 2015 | - | 2 | - | 6 | 33 | 6 | 14 | - | 4 | 12 | 9 | - | 91 | 2 | - | - | - |
| 2020 | 2 | - | - | - | 2 | - | 7 | 5 | - | - | - | - | 1 | 2 | - | - | 2 |
| 2025 | - | - | - | - | 9 | - | 10 | 4 | - | 1 | 2 | 0 | 29 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | - | 0.2 | 0.1 | 0.0 | 0.2 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.2 | - | 0.1 |
| 2000 | - | 0.0 | - | - | - | - | 0.3 | - | - | - | 0.2 | 0.0 | 0.0 | - | - | - | - |
| 2005 | - | 0.0 | - | 0.1 | 0.0 | - | 0.3 | - | - | 0.0 | - | - | 0.0 | - | - | - | 0.0 |
| 2010 | - | 0.3 | 0.0 | 0.0 | 1.2 | 0.0 | - | - | 0.2 | 0.0 | 0.0 | 0.6 | 0.6 | - | - | 0.0 | 0.0 |
| 2015 | - | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.8 | - | 0.0 | 0.0 | 0.0 | - | 2.5 | 0.0 | - | - | - |
| 2020 | 0.0 | - | - | - | 0.0 | - | 0.1 | 0.0 | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 |
| 2025 | - | - | - | - | 0.1 | - | 0.6 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.8 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Lappula occidentalis[a] (flatspine stickseed) | Lepidium ramosissimum[a] (manybranched pepperweed) | Lupinus (lupine) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Microsteris gracilis[a] (slender phlox) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) | Polygonum douglasii[a] (Douglas' knotweed) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) | unknown perennial forb (unknown forb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 17 | 229 | - | - | 11 | - | 5 | 5 | 286 | 2 | - | 35 | 52 | 121 | 21 | 2 | 27 |
| 2000 | - | - | - | - | - | - | - | - | 70 | - | - | - | - | 47 | - | - | - |
| 2005 | - | 277 | - | - | 3 | - | - | 2 | 297 | - | - | 5 | 60 | 118 | - | - | - |
| 2010 | 33 | 41 | 5 | - | - | 1 | - | - | 2 | 4 | - | 6 | 8 | 183 | - | 4 | - |
| 2015 | 33 | 172 | - | - | 6 | 2 | - | 6 | 282 | - | - | - | 69 | 244 | - | 5 | - |
| 2020 | 7 | - | - | 1 | 23 | - | 3 | 7 | 53 | - | - | 1 | 3 | 205 | 69 | 3 | - |
| 2025 | 7 | 5 | - | 10 | - | - | - | - | 44 | - | 4 | 1 | 11 | 95 | 18 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 1.0 | - | - | 0.0 | - | 0.0 | 0.0 | 2.3 | 0.0 | - | 0.1 | 0.2 | 1.1 | 0.1 | 0.0 | 0.1 |
| 2000 | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | 0.3 | - | - | - |
| 2005 | - | 2.8 | - | - | 0.0 | - | - | 0.0 | 5.6 | - | - | 0.1 | 0.6 | 2.6 | - | - | - |
| 2010 | 0.2 | 0.1 | 0.0 | - | - | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.1 | 5.0 | - | 0.1 | - |
| 2015 | 0.1 | 0.9 | - | - | 0.0 | 0.0 | - | 0.0 | 2.9 | - | - | - | 0.4 | 7.5 | - | 0.0 | - |
| 2020 | 0.0 | - | - | 0.0 | 0.3 | - | 0.0 | 0.0 | 0.2 | - | - | 0.0 | 0.0 | 6.9 | 0.9 | 0.0 | - |
| 2025 | 0.2 | 0.0 | - | 0.2 | - | - | - | - | 0.3 | - | 0.0 | 0.0 | 0.5 | 3.4 | 0.4 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Zigadenus paniculatus (foothill deathcamas) |
|---|---|
| year | Nested |
| 1995 | - |
| 2000 | - |
| 2005 | - |
| 2010 | 3 |
| 2015 | 2 |
| 2020 | - |
| 2025 | - |
| year | Average Cover (%) |
| 1995 | - |
| 2000 | - |
| 2005 | - |
| 2010 | 0.0 |
| 2015 | 0.0 |
| 2020 | - |
| 2025 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-08.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | |
| 1995 | - | - | - | - |
| 2000 | - | - | - | - |
| 2005 | 2.7 | 3.8 | 0.5 | 1.6 |
| 2010 | - | 1.9 | - | - |
| 2015 | - | 2 | - | - |
| 2020 | - | 2.5 | 0 | - |
| 2025 | - | 2.4 | - | - |
| year | Quadrat Cover (%) | | | |
| 1995 | 1.5 | - | - | 1.8 |
| 2000 | 2.3 | - | - | 1.0 |
| 2005 | 2.6 | 0.0 | 0.0 | 0.0 |
| 2010 | - | 0.0 | - | - |
| 2015 | - | 0.0 | - | - |
| 2020 | - | 0.0 | 0.0 | - |
| 2025 | - | 0.0 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-08.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 1620 | 160 | 46 | 52 | 3 | 27 | 1 | 3 | 43/67 |
| 2000 | 2480 | 20 | 50 | 48 | 2 | 28 | 44 | 2 | 36/54 |
| 2005 | 1540 | 20 | 13 | 66 | 21 | 10 | 75 | 23 | 38/53 |
| 2010 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 28/37 |
| 2015 | - | - | - | - | - | - | - | - | 34/45 |
| 2020 | - | - | - | - | - | - | - | - | 47/63 |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 49/70 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 63/83 |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 26/40 |
| 2000 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/39 |
| 2005 | - | - | - | - | - | - | - | - | 35/49 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/49 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 28/42 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 22/33 |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 10/39 |
| 2010 | - | - | - | - | - | - | - | - | 12/38 |
| 2015 | - | - | - | - | - | - | - | - | 13/33 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

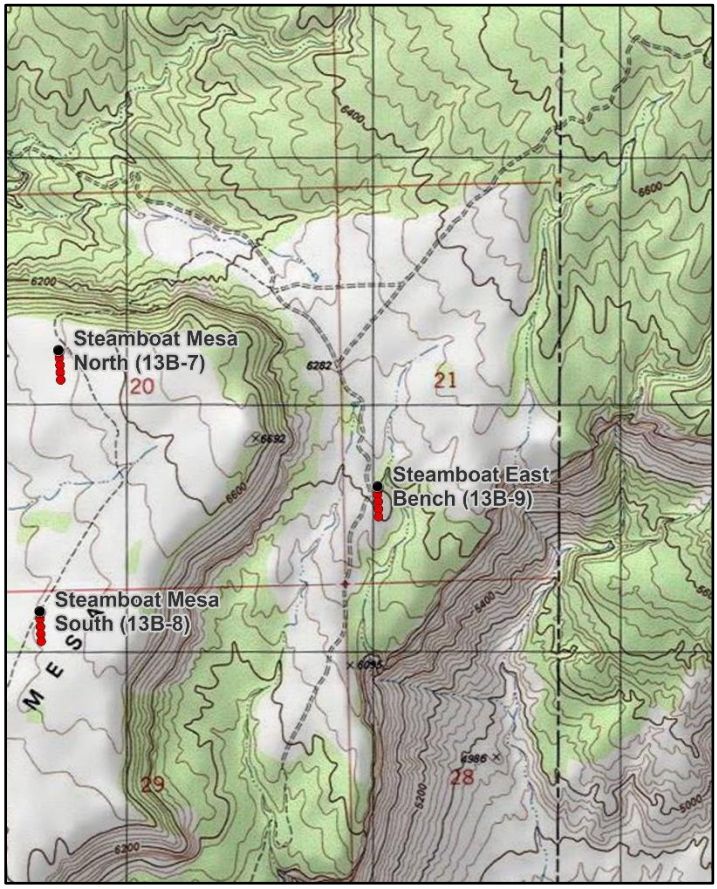
**Table 13B-08.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

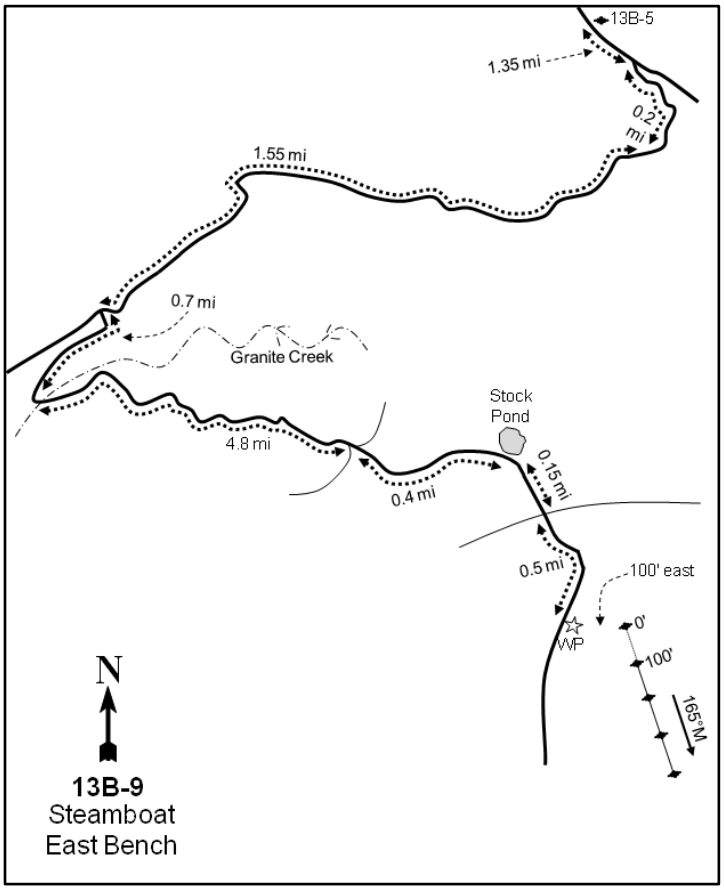
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 6 | - | - | - | - | - | 3.1 |
| 2015 | 2 | - | - | - | 100 | - | 82.0 |
| 2020 | 3 | - | - | - | - | 100 | 74.0 |
| 2025 | 2 | - | - | - | - | 100 | 69.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 2 | - | - | - | - | - | 21.0 |

**Table 13B-08.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 1.9 | 0.0 | 0.0 | 6.0 | -12.0 | 4.1 | 0.0 | **0.0** | Very Poor |
| 2000 | 2.9 | 0.0 | 0.0 | 30.0 | -2.3 | 1.4 | 0.0 | **32.0** | Very Poor |
| 2005 | 4.0 | 0.0 | 0.0 | 9.0 | -20.0 | 6.2 | 0.0 | **-0.8** | Very Poor |
| 2010 | 0.0 | 0.0 | 0.0 | 9.4 | -11.0 | 10.0 | 0.0 | **8.4** | Very Poor |
| 2015 | 0.0 | 0.0 | 0.0 | 27.9 | -20.0 | 10.0 | 0.0 | **17.9** | Very Poor |
| 2020 | 0.0 | 0.0 | 0.0 | 20.6 | -20.0 | 10.0 | 0.0 | **10.6** | Very Poor |
| 2025 | 0.0 | 0.0 | 0.0 | 25.2 | -5.3 | 8.5 | 0.0 | **28.4** | Very Poor |

# STEAMBOAT EAST BENCH - STUDY NO. 13B-9




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Steamboat Mesa SW; Township 23S, Range 26E, Section 21 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 667958 East 4294860 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7890 |
| Transect Bearing | 165° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Buckhorn Draw transect (13B-05), continue southeast for 1.4 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left and go 1.6 miles. Turn left and continue for 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then go right at another fork which connects back to the main road. Drive 0.4 miles to a stock pond. Continue 0.2 miles to a fork with many branches (the right goes up on Steamboat Mesa). Stay on the same road (straight through the intersection and up a steep hill) for 0.5 miles to an old pinyon-juniper chaining and a 2 ½-foot tall rebar witness post on the left (east), 6 feet off of the road. The 0-foot end of the baseline is 100 feet east of the witness post and is marked by a rebar tagged with #7890.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | STEAMBOAT MESA |
| Elevation | 6,200ft (1,890m) |
| Aspect | South-Southwest |
| Slope | 7% |
| Sample Dates | 06/07/1995, 09/12/2000, 05/24/2005, 05/25/2010, 05/20/2015, 05/21/2020, 05/21/2025 |

**Table 13B-09.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Aerial Before | Steamboat Mesa Reseeding 1967 | LTDL 11188-30313 | August-December 1967 | 1352 |
| Chaining - Two-Way Unknown | Steamboat Mesa Reseeding 1967 | LTDL 11188-30312 | August-December 1967 | 1352 |

**Table 13B-09.2 Seed Mix.** List of known seeded plant species and rates (if available).

| Mix Name | | | Application Type | Application Date | Acres |
|---|---|---|---|---|---|
| | | | Aerial | Aug 1967 | 1352 |
| Type | Species | Common Name | Cultivar/Source ID | Bulk lbs/acre | PLS |
| G | Agropyron desertorum | Crested Wheatgrass | | 4.39 | 0.00 |
| F | Medicago sativa | Alfalfa | Ladak | 0.80 | 0.00 |
| S | Artemisia | Sagebrush | | 0.80 | 0.00 |
| S | Atriplex canescens | Fourwing Saltbush | | 1.20 | 0.00 |
| S | Purshia | Bitterbrush | | 0.02 | 0.00 |

## Wildlife Habitat and Vegetation History

**Table 13B-09.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 13B-09.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1986 | Pinyon-Juniper | Phase II |
| 1995 | Pinyon-Juniper | Phase II |
| 2000 | Pinyon-Juniper | Phase II transitioning to Phase III |
| 2005 | Pinyon-Juniper | Phase II transitioning to Phase III |
| 2010 | Pinyon-Juniper | Phase II transitioning to Phase III |
| 2015 | Pinyon-Juniper | Phase II transitioning to Phase III |
| 2020 | Pinyon-Juniper | Phase II transitioning to Phase III |
| 2025 | Pinyon-Juniper | Phase II transitioning to Phase III |

## Site Notes

No Notes

## Soils

**Table 13B-09.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.3 | 57.6 | 17.1 | 25.3 | 2.0 | 1.9 | 80.0 | 0.6 | 09/12/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Upland Shallow Loam (Pinyon/Utah Juniper) |
| NRCS Ecological Site # | R036XY315UT |
| States and Transitions | 1986-1995 - Current Potential State: Community Phase 2.2<br>2000-2025 - Eroded State: Community Phase 3.1 |

The plant community on this site has remained in a stable state as a twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*)-dominated woodland since study establishment in 1986 (Pre-1992 Data). Tree cover decreased between 2015 and 2025, but the site has remained in Phase II transitioning to Phase III of woodland succession since 2000 (Photos, Table 13B-09.4, Table 13B-09.12, Table 13B-09.13, Table 13B-09.14). Encroachment of pinyon and juniper will likely continue in the future without a major tree-removing disturbance. A variety of browse species have been present in the understory, but they have provided relatively little cover (Table 13B-09.12). The herbaceous understory has remained diverse, but it has not been abundant in recent sample years (Table 13B-09.7). Although the introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed throughout the study period, it has contributed little cover (Table 13B-09.10). Forbs have remained rare (Table 13B-09.11).

Deer winter range condition on this site has ranged between very poor and fair since 1995. In 2025, deer winter range condition was considered to be very poor. Improvements to deer winter range could be achieved by introducing preferred browse species to the community. Additional improvement could come from diversifying and increasing the cover of perennial grasses and forbs. Attention should be given to the presence of cheatgrass, which could decrease the resistance and resilience of the site to disturbance if it increases in the future (Table 13B-09.6, Table 13B-09.7, Table 13B-09.10, Table 13B-09.13, Table 13B-09.15). Pellet group data

suggests that deer presence has remained low since 2000. Elk presence has remained low over the same period but was at its highest in 2025 (Table 13B-09.9). Additional on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 13B-09.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 4.6 | 0.7 | 14.4 | - | - | - |
| 2000 | 4.2 | 1.4 | 17.8 | - | - | - |
| 2005 | 2.1 | 0.9 | 9.4 | 5.7 | 0.8 | 30.3 |
| 2010 | 2.9 | 1.5 | 16.7 | 5.3 | 1.0 | 23.9 |
| 2015 | 2.7 | 0.9 | 16.4 | 2.6 | 0.7 | 39.0 |
| 2020 | 2.6 | 3.7 | 18.5 | 3.8 | 2.8 | 26.7 |
| 2025 | 2.0 | 1.9 | 15.9 | 3.8 | 1.6 | 26.7 |

**Table 13B-09.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 291 | 181 | 80 | 112 | 3.0 | 3.4 | 0.2 | 1.3 |
| 2000 | 6 | 156 | 6 | 63 | 0.1 | 7.8 | 0.0 | 1.7 |
| 2005 | 163 | 170 | 152 | 179 | 2.6 | 5.4 | 1.1 | 3.6 |
| 2010 | 161 | 187 | 57 | 97 | 2.5 | 7.3 | 0.2 | 2.8 |
| 2015 | 41 | 145 | 53 | 43 | 0.2 | 2.2 | 0.8 | 0.9 |
| 2020 | 42 | 74 | 60 | 71 | 0.2 | 2.1 | 0.6 | 1.4 |
| 2025 | 140 | 66 | 44 | 51 | 1.8 | 2.4 | 0.3 | 0.9 |

**Table 13B-09.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 25.8 | 0.8 | 41.2 | 0.5 | 15.5 | 27.6 |
| 2000 | 28.6 | 1.7 | 50.6 | 6.5 | 11.8 | 32.4 |
| 2005 | 37.1 | 0.4 | 37.6 | 1.8 | 11.4 | 22.8 |
| 2010 | 26.1 | 1.5 | 44.3 | 5.0 | 13.6 | 33.9 |
| 2015 | 33.0 | 3.0 | 45.6 | 5.8 | 15.8 | 22.8 |
| 2020 | 27.2 | 3.7 | 51.7 | 6.0 | 16.1 | 26.2 |
| 2025 | 36.1 | 0.9 | 48.3 | 2.3 | 13.2 | 23.6 |

**Table 13B-09.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 6 | 9 | 17 |
| 2000 | 1 | 10 | - | 15 |
| 2005 | 2 | 16 | 8 | 28 |
| 2010 | 2 | 10 | 3 | 19 |
| 2015 | - | 8 | 4 | 20 |
| 2020 | - | 9 | 1 | 16 |
| 2025 | - | 4 | 17 | 35 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 16.8 (41.4) | 7.4 (18.2) | - |
| 2005 | 5.1 (12.6) | 16.8 (41.4) | 7.4 (18.2) | - |
| 2010 | 8.0 (19.7) | 16.1 (39.7) | 6.7 (16.6) | - |
| 2015 | 2.9 (7.2) | 9.4 (23.2) | 6.7 (16.6) | - |
| 2020 | - | 8.1 (19.9) | 6.0 (14.9) | - |
| 2025 | 0.7 (1.8) | 1.3 (3.3) | 28.1 (69.5) | - |

**Table 13B-09.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Aristida purpurea (purple threeawn) | Bromus tectorum[ai] (cheatgrass) | Elymus elymoides (squirreltail) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa bulbosa[i] (bulbous bluegrass) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | 17 | 119 | 16 | 291 | 7 | - | 18 | - | 17 | - | 4 |
| 2000 | 11 | 105 | 14 | 6 | 4 | - | 21 | - | - | 2 | - |
| 2005 | 7 | 91 | 14 | 156 | 24 | 2 | 23 | - | 10 | 12 | 15 |
| 2010 | 30 | 125 | - | 161 | 11 | 3 | 18 | 1 | 6 | 7 | - |
| 2015 | 0 | 112 | 8 | 41 | 9 | - | 14 | - | - | 14 | 3 |
| 2020 | 2 | 31 | 4 | 40 | 9 | 5 | 14 | - | - | 12 | 4 |
| 2025 | 5 | 39 | 0 | 140 | 5 | 0 | 13 | - | 1 | 13 | - |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | 0.5 | 2.0 | 0.4 | 3.0 | 0.0 | - | 0.5 | - | 0.0 | - | 0.0 |
| 2000 | 0.7 | 5.2 | 0.8 | 0.1 | 0.0 | - | 1.0 | - | - | 0.0 | - |
| 2005 | 0.2 | 2.8 | 0.3 | 2.6 | 0.5 | 0.0 | 1.2 | - | 0.2 | 0.2 | 0.0 |
| 2010 | 1.3 | 4.8 | - | 2.5 | 0.3 | 0.0 | 0.6 | 0.0 | 0.0 | 0.2 | - |
| 2015 | 0.0 | 1.2 | 0.4 | 0.1 | 0.0 | - | 0.5 | - | - | 0.0 | 0.0 |
| 2020 | 0.1 | 1.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.4 | - | - | 0.1 | 0.0 |
| 2025 | 0.2 | 1.6 | 0.0 | 1.8 | 0.0 | 0.0 | 0.4 | - | 0.0 | 0.1 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 13B-09.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Aliciella hutchinsifolia[a] (desert pale gilia) | Alyssum alyssoides[ai] (pale madwort) | Arabis drummondii (Drummond's rockcress) | Arabis fendleri var. fendleri (Fendler's rockcress) | Artemisia dracunculus (tarragon) | Astragalus mollissimus (woolly locoweed) | Astragalus wingatanus (Fort Wingate milkvetch) | Calochortus nuttallii (sego lily) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chamaesyce (sandmat) | Chenopodium fremontii[a] (Fremont's goosefoot) | Cryptantha[a] (annual cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Draba nemorosa[a] (woodland draba) | Erigeron pumilus (shaggy fleabane) | Erodium cicutarium[ai] (redstem stork's bill) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 28 | - | 9 | - | - | 10 | 5 | 6 | - | 4 | - | 25 | 16 | - | 4 | - | 19 |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 |
| 2005 | 56 | - | - | - | 7 | 11 | 11 | 2 | - | - | 2 | 12 | 5 | 18 | 70 | - | 36 |
| 2010 | 14 | - | - | - | - | 8 | - | 3 | 4 | - | - | - | 9 | 3 | 3 | 5 | 3 |
| 2015 | 5 | - | - | 11 | 1 | 7 | 3 | - | - | - | - | - | - | 6 | 5 | - | 20 |
| 2020 | 4 | - | 6 | - | - | 5 | 4 | 1 | 33 | 1 | - | 10 | 2 | - | 1 | - | - |
| 2025 | - | 1 | - | 5 | - | - | 4 | - | 36 | 4 | - | - | - | - | - | - | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | - | 0.0 | - | - | 0.1 | 0.0 | 0.0 | - | 0.0 | - | 0.1 | 0.0 | - | 0.0 | - | 0.0 |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 |
| 2005 | 0.3 | - | - | - | 0.0 | 0.1 | 0.3 | 0.0 | - | - | 0.0 | 0.1 | 0.0 | 0.2 | 0.3 | - | 0.2 |
| 2010 | 0.0 | - | - | - | - | 0.3 | - | 0.0 | 0.0 | - | - | - | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2015 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.2 |
| 2020 | 0.0 | - | 0.0 | - | - | 0.2 | 0.0 | 0.0 | 0.4 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | - |
| 2025 | - | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.2 | 0.0 | - | - | - | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Erysimum capitatum[a] (sanddune wallflower) | Gilia inconspicua[a] (shy gilia) | Heterotheca villosa (hairy false goldenaster) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium montanum var. jonesii[a] (Jones' pepperweed) | Lithospermum (stoneseed) | Lupinus (lupine) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) | Packera multilobata (lobeleaf groundsel) | Penstemon cyanocaulis (bluestem beardtongue) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Physaria ludoviciana (foothill bladderpod) | Silene antirrhina[a] (sleepy silene) | Silene drummondii (Drummond's campion) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | 13 | 1 | 2 | - | 2 | - | - | 0 | - | 5 | 15 | 12 | - | - | 13 |
| 2000 | - | - | 4 | - | - | - | - | - | - | - | - | - | 17 | 10 | - | - | - |
| 2005 | - | - | 4 | - | 10 | 1 | - | - | 4 | 0 | - | 2 | 13 | 20 | 0 | - | 116 |
| 2010 | - | - | 5 | - | 39 | - | 1 | 4 | - | 1 | - | 3 | 25 | 20 | - | - | - |
| 2015 | 3 | - | - | - | 19 | 12 | - | - | - | - | - | - | 2 | 8 | - | - | - |
| 2020 | - | 9 | 3 | - | 20 | 2 | - | - | - | - | 2 | 3 | 8 | 11 | 17 | 6 | - |
| 2025 | - | - | - | - | 4 | - | - | - | - | - | - | - | 16 | 18 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | 0.2 | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.5 | 0.1 | - | - | 0.0 |
| 2000 | - | - | 0.2 | - | - | - | - | - | - | - | - | - | 1.1 | 0.1 | - | - | - |
| 2005 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | 0.5 | 0.3 | 0.0 | - | 2.3 |
| 2010 | - | - | 0.2 | - | 0.1 | - | 0.0 | 0.0 | - | 0.1 | - | 0.0 | 1.2 | 0.2 | - | - | - |
| 2015 | 0.0 | - | - | - | 0.1 | 0.2 | - | - | - | - | - | - | 0.4 | 0.2 | - | - | - |
| 2020 | - | 0.0 | 0.0 | - | 0.1 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.7 | 0.2 | 0.1 | 0.0 | - |
| 2025 | - | - | - | - | 0.0 | - | - | - | - | - | - | - | 0.2 | 0.4 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sisymbrium altissimum[ai] (tall tumblemustard) | Stenotus acaulis (stemless mock goldenweed) | Streptanthus cordatus (heartleaf twistflower) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia (Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1995 | 13 | 33 | 7 | - | - | 3 |
| 2000 | - | 31 | - | 5 | - | - |
| 2005 | 2 | 3 | 9 | 4 | - | - |
| 2010 | - | - | 4 | 21 | - | 1 |
| 2015 | 3 | 13 | 1 | 6 | 2 | - |
| 2020 | - | - | 2 | 8 | 4 | 1 |
| 2025 | - | - | 1 | 13 | - | - |
| year | Average Cover (%) | | | | | |
| 1995 | 0.0 | 0.4 | 0.0 | - | - | 0.0 |
| 2000 | - | 0.2 | - | 0.1 | - | - |
| 2005 | 0.0 | 0.0 | 0.1 | 0.0 | - | - |
| 2010 | - | - | 0.0 | 0.4 | - | 0.0 |
| 2015 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | - |
| 2020 | - | - | 0.0 | 0.1 | 0.0 | 0.0 |
| 2025 | - | - | 0.0 | 0.2 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 13B-09.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Echinocactus (echinocactus) | Ephedra viridis[p] (mormon tea) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia (pricklypear) | Pinus edulis[t] (twoneedle pinyon) | Sclerocactus (fishhook cactus) | Symphoricarpos oreophilus[p] (mountain snowberry) | Yucca harrimaniae (Spanish bayonet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 1.4 | 0.7 | - | 3.1 | - | 0.3 | 0.7 | 12.5 | 0.1 | 17.8 | 0 | 0.2 | - |
| 2010 | 0.1 | 0.2 | 0.4 | 4.2 | - | 0.4 | 0.8 | 8.1 | 0.2 | 15.8 | - | - | - |
| 2015 | 0.6 | 0.7 | - | 0.6 | - | 0.4 | 0.6 | 17.7 | - | 21.3 | - | 0.3 | 0.1 |
| 2020 | 0.9 | - | 0.2 | 2.1 | - | 0.6 | 2.8 | 15.1 | - | 11.6 | - | - | - |
| 2025 | 1.7 | 0 | 0.3 | 1.3 | - | 0.5 | 1.4 | 15 | - | 11.7 | - | - | 0.2 |
| year | Quadrat Cover (%) | | | | | | | | | | | | |
| 1995 | - | 0.8 | 0.2 | 3.2 | - | 0.1 | 0.7 | 2.9 | - | 11.5 | 0.0 | 0.1 | 0.0 |
| 2000 | - | 1.0 | 0.1 | 2.7 | - | 0.1 | 1.3 | 5.7 | 0.0 | 12.1 | 0.1 | 0.1 | 0.0 |
| 2005 | 0.0 | 0.4 | - | 1.6 | - | 0.0 | 0.8 | 3.5 | 0.1 | 5.9 | 0.0 | 0.1 | - |
| 2010 | 0.0 | 0.2 | 0.0 | 2.6 | - | 0.0 | 1.3 | 7.6 | 0.1 | 9.1 | - | - | - |
| 2015 | 0.4 | 1.2 | 0.1 | 0.9 | 0.1 | 0.0 | 0.7 | 8.0 | 0.0 | 8.3 | - | 0.1 | 0.0 |
| 2020 | 0.1 | 0.5 | 0.0 | 1.4 | - | 0.7 | 3.7 | 11.0 | - | 7.5 | - | 0.0 | - |
| 2025 | 0.1 | 0.6 | 0.0 | 1.2 | - | 0.0 | 1.9 | 6.9 | 0.0 | 9.0 | - | 0.1 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 13B-09.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 20 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | 303/428 |
| 2000 | - | - | - | - | - | - | - | - | 278/423 |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 157/210 |
| 2010 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | 152/207 |
| 2015 | 40 | 40 | 50 | 50 | 0 | 0 | 0 | 0 | 168/177 |
| 2020 | - | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 145/169 |
| 2025 | 40 | - | 50 | 0 | 50 | 0 | 0 | 50 | - / - |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 1995 | 440 | 40 | 27 | 68 | 5 | 55 | 18 | 0 | 24/46 |
| 2000 | 440 | - | 5 | 96 | 0 | 5 | 0 | 0 | 19/41 |
| 2005 | 400 | 40 | 10 | 55 | 35 | 5 | 20 | 0 | 22/52 |
| 2010 | 300 | - | 27 | 60 | 13 | 0 | 0 | 7 | 26/58 |
| 2015 | 480 | 40 | 13 | 75 | 13 | 50 | 33 | 25 | 25/62 |
| 2020 | 220 | - | 27 | 55 | 18 | 27 | 9 | 18 | 29/65 |
| 2025 | 340 | - | 12 | 77 | 12 | 29 | 12 | 12 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 120 | - | 17 | 50 | 33 | 0 | 33 | 0 | 40/56 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 23/42 |
| 2005 | - | - | - | - | - | - | - | - | 36/51 |
| 2010 | 120 | - | 17 | 83 | 0 | 67 | 0 | 0 | 27/66 |
| 2015 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | 36/41 |
| 2020 | 60 | - | 0 | 67 | 33 | 0 | 33 | 67 | 35/63 |
| 2025 | 80 | - | 75 | 0 | 25 | 25 | 0 | 25 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 79/100 |
| 2010 | - | - | - | - | - | - | - | - | 89/92 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 240 | 40 | 50 | 42 | 8 | 8 | 0 | 8 | 178/223 |
| 2000 | 120 | - | 33 | 50 | 17 | 17 | 0 | 0 | 182/208 |
| 2005 | 240 | - | 67 | 17 | 17 | 42 | 8 | 8 | 155/162 |
| 2010 | 200 | 120 | 50 | 40 | 10 | 20 | 10 | 10 | 128/134 |
| 2015 | 100 | - | 40 | 40 | 20 | 60 | 0 | 20 | 103/114 |
| 2020 | 180 | 20 | 33 | 33 | 33 | 11 | 11 | 33 | 102/121 |
| 2025 | 80 | - | 25 | 25 | 50 | 25 | 25 | 50 | - / - |
| Echinocactus -- (echinocactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/27 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 100 | 16/18 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ephedra viridis[P] -- (mormon tea) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 86/90 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 85/146 |
| 2005 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 90/151 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 102/152 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 85/142 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 66/104 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 110/143 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 109/173 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 68/86 |
| 2025 | 340 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 1680 | 260 | 8 | 88 | 4 | 0 | 0 | 1 | 23/34 |
| 2000 | 1300 | - | 3 | 68 | 29 | 0 | 0 | 29 | 15/28 |
| 2005 | 700 | 20 | 9 | 89 | 3 | 0 | 0 | 3 | 30/47 |
| 2010 | 1640 | - | 9 | 90 | 1 | 0 | 0 | 1 | 15/26 |
| 2015 | 4080 | 340 | 80 | 20 | 1 | 0 | 0 | 1 | 16/23 |
| 2020 | 19200 | 1740 | 59 | 41 | 0 | 0 | 0 | 0 | 12/16 |
| 2025 | 2820 | - | 0 | 87 | 13 | 0 | 0 | 13 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 160 | - | 25 | 63 | 13 | 0 | 0 | 0 | - / - |
| 2010 | 120 | 20 | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 160 | 40 | 0 | 100 | 0 | 25 | 0 | 25 | - / - |
| 2020 | 200 | - | 10 | 70 | 20 | 0 | 0 | 30 | - / - |
| 2025 | 200 | 20 | 20 | 70 | 10 | 0 | 0 | 20 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/28 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/31 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/32 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 50 | 42/41 |
| 2015 | 40 | - | 50 | 0 | 50 | 50 | 0 | 50 | 7/19 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/26 |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 460 | 20 | 52 | 48 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 460 | - | 35 | 65 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 340 | 20 | 71 | 29 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 300 | 40 | 40 | 60 | 0 | 7 | 0 | 13 | - / - |
| 2020 | 300 | - | 60 | 33 | 7 | 0 | 0 | 20 | - / - |
| 2025 | 300 | - | 33 | 60 | 7 | 0 | 0 | 13 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 86/121 |
| 2010 | - | - | - | - | - | - | - | - | 105/231 |
| 2015 | - | - | - | - | - | - | - | - | 69/164 |
| 2020 | - | - | - | - | - | - | - | - | 58/189 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 28/21 |
| 2000 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/15 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/16 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/11 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 76/146 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 90/185 |
| 2010 | - | - | - | - | - | - | - | - | 75/134 |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 55/93 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 57/103 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Yucca harrimaniae -- (Spanish bayonet) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 31/36 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/39 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 28/40 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 33 | 25/38 |
| 2020 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 33/38 |
| 2025 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

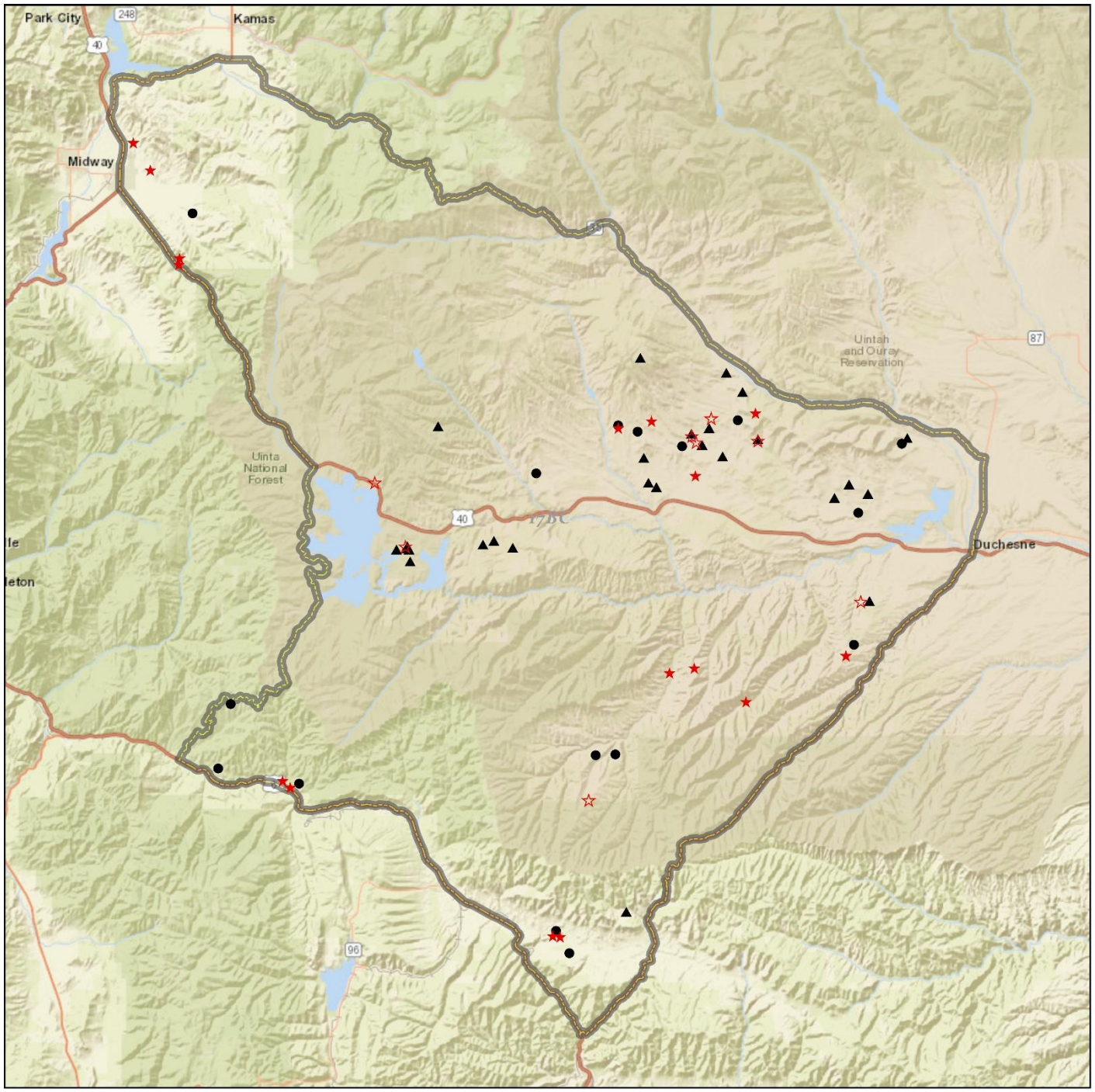
**Table 13B-09.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 64 | - | - | - | - | - | 15.9 |
| 2000 | 67 | - | - | - | - | - | 13.4 |
| 2005 | 64 | - | 11 | 44 | 44 | - | 20.9 |
| 2010 | 60 | - | - | 12 | 59 | 29 | 17.7 |
| 2015 | 91 | - | 17 | 22 | 50 | 11 | 22.1 |
| 2020 | 90 | 5 | 21 | 11 | 32 | 32 | 20.4 |
| 2025 | 94 | - | 11 | 16 | 47 | 26 | 18.3 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 200 | - | - | - | - | - | 7.2 |
| 2000 | 274 | - | - | - | - | - | 6.2 |
| 2005 | 184 | - | 30 | 50 | 15 | 5 | 9.8 |
| 2010 | 162 | - | 53 | 32 | 11 | 5 | 6.9 |
| 2015 | 203 | - | 30 | 45 | 15 | 10 | 10.6 |
| 2020 | 119 | - | 28 | 28 | 28 | 17 | 14.0 |
| 2025 | 98 | - | 17 | 33 | 33 | 17 | 10.6 |

**Table 13B-09.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 6.5 | 0.0 | 0.0 | 6.9 | -2.3 | 2.7 | 0.0 | **13.8** | Very Poor |
| 2000 | 5.9 | 0.0 | 0.0 | 15.5 | -0.1 | 3.3 | 0.0 | **24.6** | Very Poor |
| 2005 | 8.2 | 11.0 | 15.0 | 10.9 | -2.0 | 7.2 | 0.0 | **50.3** | Poor-Fair |
| 2010 | 7.7 | 12.4 | 15.0 | 14.6 | -1.9 | 5.6 | 0.0 | **53.4** | Fair |
| 2015 | 3.5 | 0.0 | 0.0 | 4.3 | -0.1 | 1.7 | 0.0 | **9.4** | Very Poor |
| 2020 | 5.5 | 0.0 | 0.0 | 4.2 | -0.1 | 2.8 | 0.0 | **12.4** | Very Poor |
| 2025 | 5.5 | 0.0 | 0.0 | 4.7 | -1.3 | 1.8 | 0.0 | **10.7** | Very Poor |

# WILDLIFE MANAGEMENT UNIT 17B&C – WASATCH MOUNTAINS, EAST



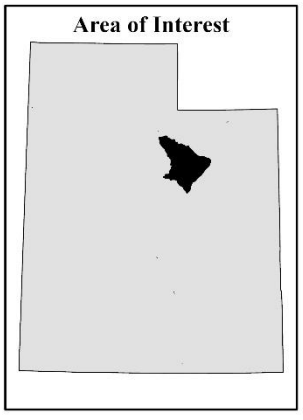

0 3 6 12 18 24 30 36 42 48 Miles

**Study Locations Project, Status**

- RT, Active
- RT, Suspended
- WRI, Active
- WRI, Suspended

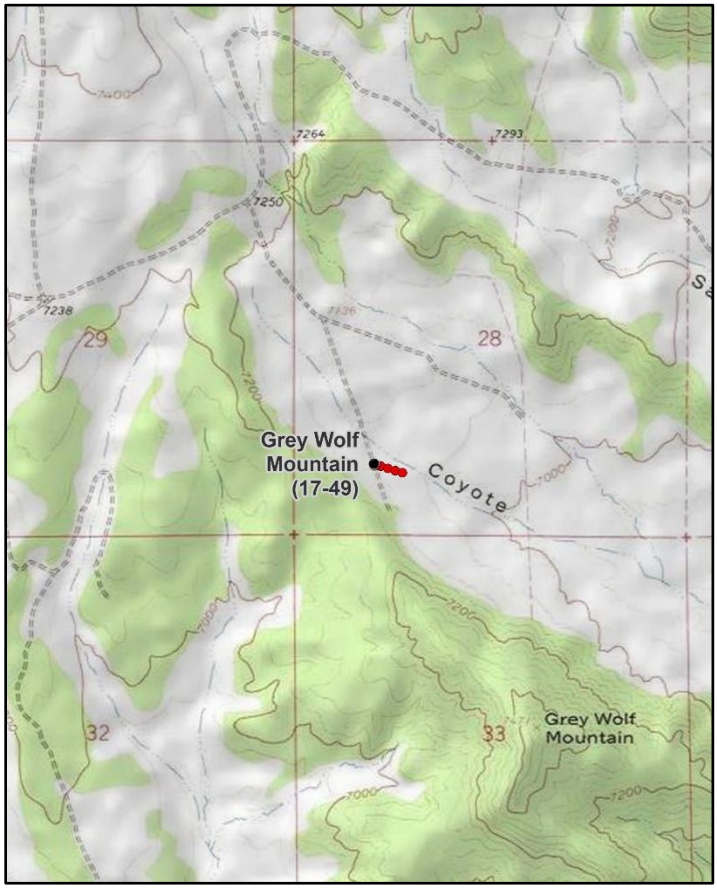
**Unit Boundary**

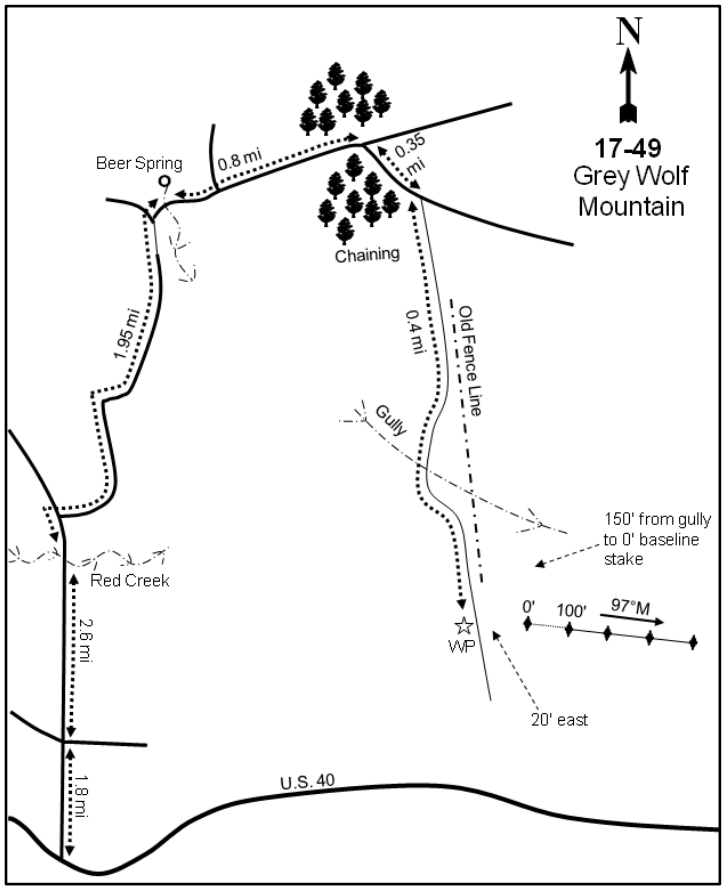
- Unit - 17B, 17C




Credits: Esri, HERE, Garmin, NGA, USGS, NPS

# GREY WOLF MOUNTAIN - STUDY NO. 17-49




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tabby Mountain SE; Township 2S, Range 8W, Section 28 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 517136 East 4458065 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7090 |
| Transect Bearing | 97° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (15ft & 96ft), Line 2 (39ft), Line 3 (52ft), Line 4 (66ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from U.S. 40 in Fruitland, travel north up Red Creek Road for 1.8 miles to a three-way fork. Take the middle fork and continue for 2.6 miles. After crossing Red Creek, turn right onto a dirt road. Proceed northeast on this road for 2 miles to Beer Spring. From the southwest corner of the fenced spring, bear right and continue driving for 0.8 miles. Turn right and go 0.4 miles. Stay right and continue 0.4 miles, going around the gully to an old fence line and then to a witness post on the right (west) side of the road (it may not be possible to drive across the deep gully). The 0-foot stake is 20 feet east of the witness post and is marked by browse tag #7090. The 0-foot stake is also approximately 150 feet south of the gully.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 7,082ft (2,159m) |
| Aspect | East |
| Slope | 2-4% |
| Sample Dates | 07/27/1995, 07/13/2000, 06/22/2005, 07/01/2010, 06/17/2015, 07/28/2020, 07/29/2025 |

**Table 17-49.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Disc - Disc Unknown | - | - | Fall 1990 | - |
| Seeding - Seed Unknown | - | - | Fall 1990 | - |

## Wildlife Habitat and Vegetation History

**Table 17-49.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | crucial | winter |

**Table 17-49.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | No Encroachment |
| 1988 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 1995 | Perennial Grass/Mountain Big Sagebrush | No Encroachment |
| 2000 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2005 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2010 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2015 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2020 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2025 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |

## Site Notes

Trespassing cattle have been observed in the area during past readings. Grazing is managed by the DWR for spring grazing (April/May) to promote browse.

## Soils

**Table 17-49.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.5 | 42.9 | 26.8 | 30.3 | 2.1 | 3.6 | 204.8 | 0.7 | 07/13/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Upland Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC310UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

When the study was established in 1982, the plant community on this site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) (Photos, Pre-1992 Data). Following treatment in 1990 (Table 17-49.1), the community transitioned to one co-dominated by perennial grasses with the introduced perennial species crested wheatgrass (*Agropyron cristatum*) as the most abundant species (Pre-1992 Data, Table 17-49.10). Since 1988, the forb community has remained diverse, yet it has lacked in abundance (Table 17-49.11). Overall sagebrush density has exhibited a generally decreasing trend after treatment (Table 17-49.13). Cover of sagebrush, however, has increased since 2015 (Table 17-49.12). Twoneedle pinyon (*Pinus edulis*) has been observed on site since 2000 (Photos, Table 17-49.13, Table 17-49.14); there may be potential for further encroachment in future sample years. However, the site has been considered to be within Early Phase I of woodland succession since 2000 (Table 17-49.4), indicating that further tree encroachment may not be an immediate concern.

Deer winter range condition on this site has fluctuated between very poor-poor and fair since 1995; the study site was considered to be in fair condition in 2025. Improvement to deer winter range could be accomplished through efforts that support preferred browse reproduction within the population. Diversifying and increasing the native perennial forb populations would also improve winter range conditions (Table 17-49.10, Table 17-49.11, Table 17-49.13, Table 17-49.15). In addition, the sagebrush component of this site could provide valuable browse for deer and elk during the winter months (Table 17-49.3; Wambolt, 1996). However, pellet transect data indicates that elk and deer presence has ranged between low and moderate in most years sampled; wildlife presence was at its highest in 2005 (Table 17-49.9). During the 2024/25 winter season the area had frequent occurrences of collared elk, and occasional collared mule deer (Wildlife Migration Initiative). Sagebrush utilization has varied from year to year. However, more than 70% of sagebrush plants sampled in density strips have been moderately to heavily hedged in most sample years since 2005 (Table 17-49.13). However, on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 17-49.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 2.7 | 3.4 | - | - | - | - |
| 2000 | 4.1 | 4.5 | - | - | - | - |
| 2005 | 3.6 | 4.7 | - | 4.7 | 6.1 | - |
| 2010 | 4.8 | 2.0 | - | 5.3 | 2.2 | - |
| 2015 | 3.2 | 1.4 | - | 5.0 | 1.5 | - |
| 2020 | 6.0 | 7.2 | - | 7.2 | 7.4 | - |
| 2025 | 5.8 | 4.7 | - | 6.9 | 5.4 | - |

**Table 17-49.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 8 | 335 | 40 | 318 | 0.1 | 10.0 | 0.3 | 7.5 |
| 2000 | - | 405 | - | 215 | - | 17.7 | - | 3.2 |
| 2005 | - | 369 | 26 | 220 | - | 20.1 | 0.2 | 3.8 |
| 2010 | - | 393 | 13 | 216 | - | 22.0 | 0.1 | 2.5 |
| 2015 | - | 410 | - | 189 | - | 25.5 | - | 1.2 |
| 2020 | - | 371 | - | 93 | - | 24.4 | - | 1.6 |
| 2025 | - | 393 | 3 | 152 | - | 20.9 | 0.0 | 1.5 |

**Table 17-49.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 54.0 | 0.2 | 21.4 | - | - | 23.5 |
| 2000 | 58.1 | 0.5 | 32.7 | 0.1 | 0.0 | 30.0 |
| 2005 | 56.2 | 0.9 | 23.1 | 0.0 | - | 29.5 |
| 2010 | 59.2 | 0.1 | 28.7 | - | - | 30.1 |
| 2015 | 48.8 | 1.0 | 29.2 | - | - | 30.4 |
| 2020 | 51.3 | 1.0 | 39.1 | 0.1 | 0.7 | 34.2 |
| 2025 | 44.5 | 1.6 | 37.5 | 0.6 | 0.0 | 31.2 |

**Table 17-49.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Pronghorn | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 1995 | - | 1 | - | 11 | 7 | 2 |
| 2000 | - | 2 | - | 25 | 15 | 1 |
| 2005 | - | 7 | - | 14 | 32 | 6 |
| 2010 | - | 7 | - | 18 | 19 | 7 |
| 2015 | - | - | - | 35 | 28 | 58 |
| 2020 | - | 1 | - | 17 | 18 | 6 |
| 2025 | - | 1 | - | 10 | 41 | 11 |
| Year | Days Use Per Acre (ha) | | | | | |
| 1995 | - | - | - | - | - | - |
| 2000 | 0.7 (1.7) | 6.5 (16.1) | - | 34.2 (84.4) | 12.8 (31.5) | - |
| 2005 | - | 14.5 (35.9) | 8.7 (21.5)* | 57.7 (142.4) | 46.9 (115.9) | - |
| 2010 | - | 19.6 (48.4) | - | 39.6 (97.7) | 20.1 (49.7) | - |
| 2015 | - | - | - | 6.0 (14.9) | 16.1 (39.7) | - |
| 2020 | - | 13.8 (34.1) | - | 33.5 (82.8) | 12.8 (31.5) | - |
| 2025 | - | 5.8 (14.3) | - | 25.5 (62.9) | 42.9 (105.9) | - |

*Pellets per acre (ha)

**Table 17-49.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Carex (sedge) | Dactylis glomerata[i] (orchardgrass) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Secale cereale[ai] (cereal rye) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 7 | 312 | 4 | 10 | 8 | 21 | - | - | 2 | - | 8 | 34 |
| 2000 | - | 393 | 2 | 1 | 5 | 36 | 1 | 8 | - | - | - | 5 |
| 2005 | 2 | 368 | - | - | - | 7 | - | - | - | 5 | - | - |
| 2010 | 1 | 390 | - | 2 | - | 12 | - | - | - | 1 | - | 7 |
| 2015 | 2 | 407 | - | 5 | 7 | 3 | - | - | 1 | 1 | - | 2 |
| 2020 | 3 | 371 | 1 | - | - | 2 | - | 1 | 1 | - | - | - |
| 2025 | 1 | 387 | - | 6 | - | 14 | - | 8 | 3 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.1 | 9.4 | 0.0 | 0.0 | 0.0 | 0.3 | - | - | 0.0 | - | 0.1 | 0.1 |
| 2000 | - | 17.0 | 0.0 | 0.0 | 0.1 | 0.4 | 0.0 | 0.2 | - | - | - | 0.0 |
| 2005 | 0.0 | 19.6 | - | - | - | 0.1 | - | - | - | 0.3 | - | - |
| 2010 | 0.0 | 21.8 | - | 0.0 | - | 0.2 | - | - | - | 0.0 | - | 0.0 |
| 2015 | 0.1 | 25.1 | - | 0.0 | 0.2 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 |
| 2020 | 0.4 | 23.8 | 0.0 | - | - | 0.1 | - | 0.0 | 0.0 | - | - | - |
| 2025 | 0.1 | 20.0 | - | 0.2 | - | 0.2 | - | 0.3 | 0.0 | - | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-49.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium (onion) | Arabis (rockcress) | Astragalus 2 (Milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus mollissimus (woolly locoweed) | Astragalus tenellus (looseflower milkvetch) | Calochortus nuttallii (sego lily) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) | Cordylanthus kingii[a] (King's bird's-beak) | Crepis acuminata (tapertip hawksbeard) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 73 | 7 | - | - | 26 | 5 | - | 7 | - | 8 | 10 | 0 | 11 | - | - | 5 | 3 |
| 2000 | - | - | 4 | - | 6 | 4 | - | - | 3 | - | - | 3 | - | - | 1 | - | - |
| 2005 | - | 5 | - | - | 27 | - | 3 | 17 | - | - | - | - | 6 | 2 | 3 | 2 | - |
| 2010 | - | - | - | 3 | 19 | - | - | 9 | - | - | - | - | 1 | 2 | - | - | 2 |
| 2015 | - | - | 4 | - | 11 | - | 2 | - | - | - | - | - | - | - | - | - | - |
| 2020 | - | - | 1 | - | 1 | - | 4 | - | - | - | - | - | - | - | - | - | - |
| 2025 | - | - | - | - | 16 | - | 3 | - | - | - | - | - | - | - | 1 | - | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 1.9 | 0.0 | - | - | 0.2 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.1 | - | - | 0.0 | 0.0 |
| 2000 | - | - | 0.0 | - | 0.1 | 0.0 | - | - | 0.0 | - | - | 0.0 | - | - | 0.1 | - | - |
| 2005 | - | 0.0 | - | - | 0.4 | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - |
| 2010 | - | - | - | 0.0 | 0.1 | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | - | - | 0.0 |
| 2015 | - | - | 0.0 | - | 0.1 | - | 0.0 | - | - | - | - | - | - | - | - | - | - |
| 2020 | - | - | 0.0 | - | 0.0 | - | 0.0 | - | - | - | - | - | - | - | - | - | - |
| 2025 | - | - | - | - | 0.2 | - | 0.0 | - | - | - | - | - | - | - | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Hedysarum boreale (Utah sweetvetch) | Lactuca serriola[ai] (prickly lettuce) | Lappula occidentalis[a] (flatspine stickseed) | Linum lewisii (Lewis flax) | Lygodesmia grandiflora (largeflower skeletonplant) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Melilotus officinalis[i] (sweetclover) | Penstemon humilis (low beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Sanguisorba minor[i] (small burnet) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 7 | 1 | - | 74 | 3 | 5 | 0 | 17 | 9 | 39 | 83 | - | 31 | - | 178 | 8 | 50 |
| 2000 | 5 | - | - | 19 | - | 4 | - | 3 | 8 | 39 | 23 | - | 2 | - | 167 | - | 36 |
| 2005 | - | - | 18 | - | 5 | 7 | 2 | - | 3 | 6 | 57 | - | - | - | 123 | - | 73 |
| 2010 | - | - | 8 | - | - | - | - | 3 | 1 | 10 | 57 | - | - | - | 122 | 4 | 59 |
| 2015 | - | - | - | - | - | 7 | 3 | - | 5 | 42 | 53 | - | - | - | 117 | - | 28 |
| 2020 | - | - | - | - | 1 | - | 2 | - | 3 | 21 | 5 | - | - | - | 68 | - | 2 |
| 2025 | - | - | - | - | - | - | 2 | - | - | 39 | 44 | 3 | - | 4 | 58 | - | 41 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.0 | - | 1.2 | 0.0 | 0.0 | 0.0 | 0.3 | 0.1 | 0.4 | 0.3 | - | 0.2 | - | 2.4 | 0.2 | 0.2 |
| 2000 | 0.1 | - | - | 0.4 | - | 0.0 | - | 0.1 | 0.1 | 1.0 | 0.1 | - | 0.0 | - | 1.0 | - | 0.2 |
| 2005 | - | - | 0.2 | - | 0.1 | 0.1 | 0.0 | - | 0.2 | 0.2 | 0.6 | - | - | - | 1.0 | - | 1.2 |
| 2010 | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.3 | 0.2 | - | - | - | 0.8 | 0.0 | 0.8 |
| 2015 | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.2 | - | - | - | 0.5 | - | 0.1 |
| 2020 | - | - | - | - | 0.0 | - | 0.0 | - | 0.0 | 0.9 | 0.0 | - | - | - | 0.6 | - | 0.0 |
| 2025 | - | - | - | - | - | - | 0.0 | - | - | 0.8 | 0.1 | 0.0 | - | 0.0 | 0.2 | - | 0.2 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-49.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Bassia prostrata[pi] (forage kochia) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Eriogonum corymbosum (crispleaf buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - |
| 2005 | 4.1 | 0.2 | - | 2.8 | 0.1 | 2.7 | 0.6 | 0.3 | - |
| 2010 | 4.5 | 0.8 | - | 1 | - | 1.2 | - | - | - |
| 2015 | 4.5 | 0.5 | - | 0.5 | - | 1 | - | 0 | - |
| 2020 | 5.7 | 1.5 | - | 1.5 | - | 5.8 | 0.1 | 0 | - |
| 2025 | 6 | 0.8 | 0.1 | 1.6 | - | 2.9 | 0.8 | - | 0.1 |
| year | Quadrat Cover (%) | | | | | | | | |
| 1995 | 2.6 | - | 0.0 | 2.0 | 0.0 | 1.4 | - | 0.0 | 0.0 |
| 2000 | 3.9 | - | - | 2.4 | 0.0 | 2.0 | 0.0 | 0.2 | 0.0 |
| 2005 | 3.4 | 0.0 | - | 2.0 | 0.0 | 2.4 | 0.3 | 0.2 | 0.0 |
| 2010 | 4.5 | 0.2 | - | 1.1 | - | 0.8 | 0.2 | 0.2 | - |
| 2015 | 2.4 | 0.6 | - | 0.6 | - | 0.7 | - | 0.1 | 0.0 |
| 2020 | 4.4 | 1.6 | - | 1.9 | - | 5.1 | 0.1 | 0.0 | 0.2 |
| 2025 | 4.4 | 1.4 | 0.0 | 1.3 | - | 2.2 | 1.0 | 0.0 | 0.1 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-49.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 2300 | 180 | 45 | 45 | 10 | 14 | 3 | 5 | 39/52 |
| 2000 | 2800 | 40 | 29 | 58 | 13 | 39 | 21 | 1 | 38/56 |
| 2005 | 1960 | 80 | 9 | 71 | 19 | 35 | 35 | 8 | 41/53 |
| 2010 | 1760 | - | 7 | 83 | 10 | 55 | 27 | 11 | 42/57 |
| 2015 | 1680 | 20 | 10 | 71 | 19 | 5 | 93 | 1 | 35/57 |
| 2020 | 1600 | - | 8 | 81 | 11 | 11 | 5 | 13 | 42/62 |
| 2025 | 1420 | 40 | 3 | 89 | 9 | 25 | 72 | 16 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 120 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | - / - |
| Bassia prostrata[Pi] -- (forage kochia) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 480 | 4160 | 75 | 25 | 0 | 13 | 4 | 0 | 25/50 |
| 2010 | 1000 | 260 | 50 | 50 | 0 | 8 | 8 | 0 | 20/39 |
| 2015 | 2400 | 80 | 53 | 47 | 0 | 21 | 3 | 0 | 13/25 |
| 2020 | 1700 | 20 | 33 | 67 | 0 | 38 | 1 | 0 | 31/40 |
| 2025 | 1520 | 40 | 7 | 93 | 0 | 21 | 63 | 0 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 14/21 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 9/14 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 3200 | 20 | 18 | 83 | 0 | 1 | 0 | 0 | 29/36 |
| 2000 | 2960 | 20 | 3 | 96 | 1 | 0 | 0 | 3 | 18/31 |
| 2005 | 2720 | 20 | 10 | 89 | 2 | 4 | 5 | 3 | 25/35 |
| 2010 | 2300 | - | 5 | 95 | 0 | 16 | 44 | 0 | 16/26 |
| 2015 | 2180 | - | 36 | 63 | 1 | 11 | 59 | 3 | 16/23 |
| 2020 | 1740 | - | 10 | 90 | 0 | 24 | 8 | 0 | 20/27 |
| 2025 | 1420 | - | 9 | 90 | 1 | 1 | 6 | 37 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | 2960 | 100 | 19 | 81 | 0 | 0 | 0 | 0 | 35/39 |
| 2000 | 2760 | 40 | 7 | 91 | 2 | 0 | 0 | 1 | 30/41 |
| 2005 | 3020 | 60 | 23 | 73 | 5 | 15 | 4 | 3 | 31/41 |
| 2010 | 2340 | 100 | 6 | 91 | 3 | 40 | 11 | 7 | 27/32 |
| 2015 | 2540 | 60 | 21 | 63 | 17 | 14 | 54 | 2 | 24/29 |
| 2020 | 2580 | - | 10 | 90 | 0 | 5 | 1 | 1 | 39/49 |
| 2025 | 2200 | - | 3 | 96 | 1 | 23 | 1 | 6 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum heracleoides -- (parsnipflower buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 8/20 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | 42/36 |
| 2000 | 280 | - | 29 | 71 | 0 | 0 | 0 | 0 | 26/40 |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 34/54 |
| 2010 | - | - | - | - | - | - | - | - | 19/24 |
| 2015 | - | - | - | - | - | - | - | - | 32/16 |
| 2020 | - | - | - | - | - | - | - | - | 25/23 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2000 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/23 |
| 2005 | 1040 | - | 6 | 94 | 0 | 0 | 0 | 0 | 16/21 |
| 2010 | 300 | - | 7 | 93 | 0 | 7 | 0 | 0 | 12/13 |
| 2015 | 140 | - | 57 | 43 | 0 | 0 | 0 | 0 | 13/16 |
| 2020 | 380 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 21/32 |
| 2025 | 3900 | - | 10 | 90 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | 360 | - | 6 | 94 | 0 | 22 | 0 | 0 | 27/31 |
| 2000 | 220 | - | 0 | 100 | 0 | 18 | 55 | 0 | 12/24 |
| 2005 | 320 | - | 0 | 94 | 6 | 56 | 44 | 6 | 24/33 |
| 2010 | 280 | - | 14 | 79 | 7 | 50 | 7 | 7 | 18/28 |
| 2015 | 400 | - | 25 | 75 | 0 | 50 | 50 | 0 | 11/18 |
| 2020 | 280 | 20 | 21 | 79 | 0 | 14 | 7 | 0 | 17/22 |
| 2025 | 180 | 40 | 11 | 89 | 0 | 33 | 44 | 0 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1995 | 360 | - | 11 | 89 | 0 | 0 | 0 | 0 | 9/16 |
| 2000 | 300 | 20 | 0 | 93 | 7 | 0 | 0 | 0 | 7/9 |
| 2005 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 10/23 |
| 2010 | 100 | - | 0 | 100 | 0 | 0 | 0 | 20 | 10/19 |
| 2015 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/26 |
| 2020 | 160 | - | 25 | 75 | 0 | 0 | 0 | 0 | 15/40 |
| 2025 | 140 | - | 14 | 29 | 57 | 0 | 0 | 57 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 34/52 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

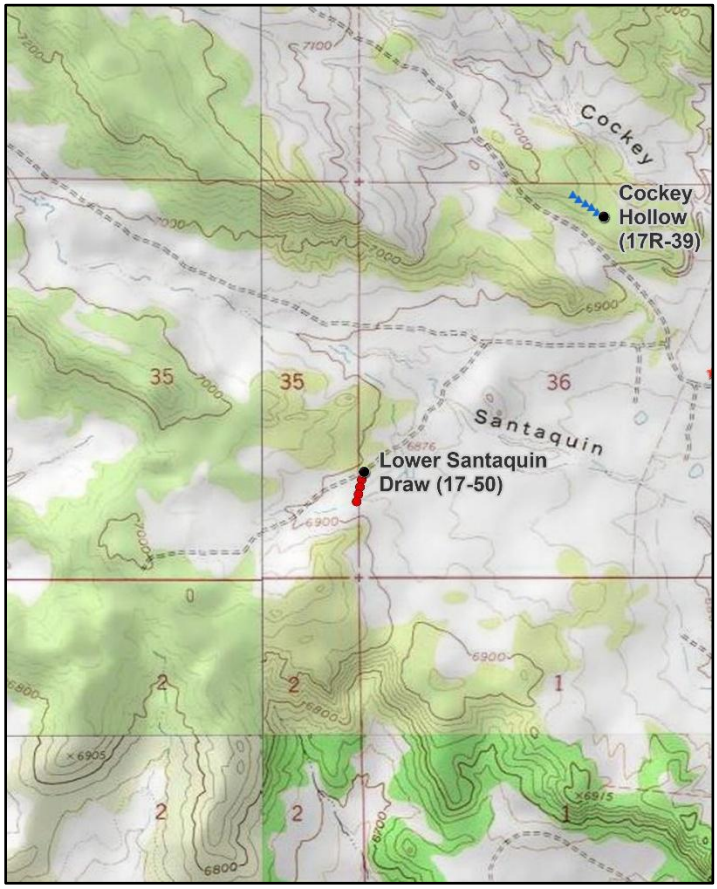
**Table 17-49.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

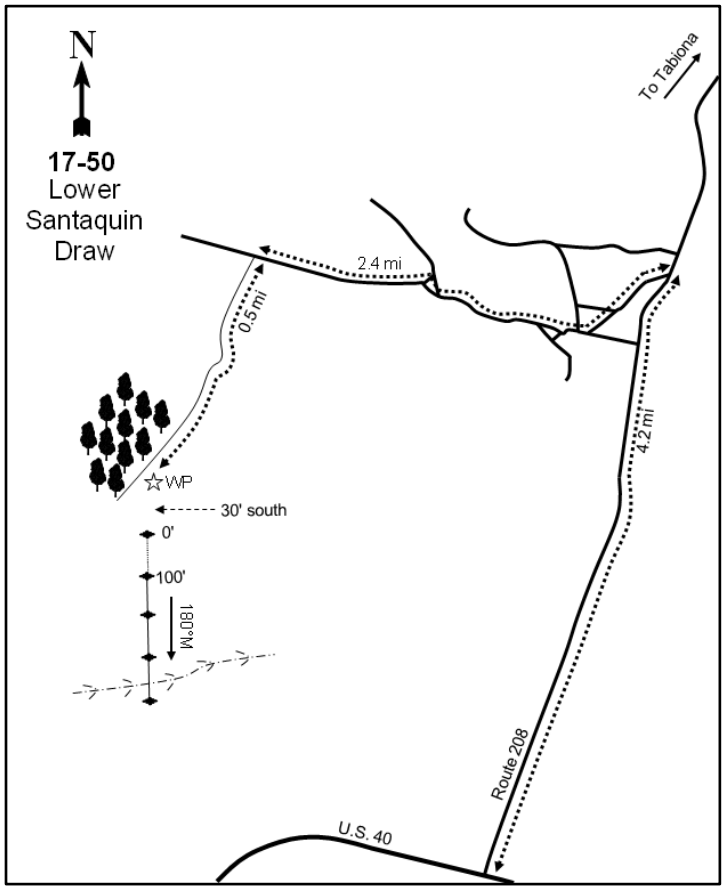
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 11 | - | 43 | 57 | - | - | 4.3 |
| 2020 | 9 | - | 40 | 60 | - | - | 9.0 |
| 2025 | 10 | - | 20 | 60 | 20 | - | 6.0 |

**Table 17-49.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 3.3 | 0.0 | 0.0 | 20.0 | 0.0 | 10.0 | 0.0 | **33.3** | Very Poor-Poor |
| 2000 | 5.2 | 0.0 | 0.0 | 30.0 | 0.0 | 6.5 | 0.0 | **41.7** | Poor |
| 2005 | 5.9 | 0.0 | 0.0 | 30.0 | 0.0 | 7.6 | 0.0 | **43.5** | Poor |
| 2010 | 6.8 | 12.4 | 6.7 | 30.0 | 0.0 | 4.9 | 0.0 | **60.8** | Fair |
| 2015 | 6.4 | 0.0 | 0.0 | 30.0 | 0.0 | 2.4 | 0.0 | **38.8** | Poor |
| 2020 | 9.4 | 12.3 | 6.4 | 30.0 | 0.0 | 3.2 | 0.0 | **61.3** | Fair |
| 2025 | 8.8 | 12.7 | 1.6 | 30.0 | 0.0 | 3.1 | 0.0 | **56.2** | Fair |

# LOWER SANTAQUIN DRAW - STUDY NO. 17-50




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tabiona SW; Township 2S, Range 8W, Section 36 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 521619 East 4456595 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 180° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 83ft), Line 2 (38ft), Line 3 (54ft), Line 4 (79ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from Highway U.S. 40, take State Route 208 towards Tabiona for 4.2 miles and turn west onto a dirt road. Go 2.4 miles on the main road towards Santaquin Draw. Take the road to the left for 0.5 miles to the next intersection, and then to a group of juniper trees on the left (west) and a witness post on the right (east) side of the road. From the witness post, the 0-foot stake is 30 feet south.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 6,890ft (2,100m) |
| Aspect | Southeast |
| Slope | 4-5% |
| Sample Dates | 07/25/1995, 06/27/2000, 06/20/2005, 06/28/2010, 06/16/2015, 07/28/2020, 07/28/2025 |

## Wildlife Habitat and Vegetation History

**Table 17-50.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |

**Table 17-50.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | No Encroachment |
| 1988 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 1995 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 2000 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2010 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2015 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2020 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |
| 2025 | Perennial Grass/Mountain Big Sagebrush | Early Phase I |

## Site Notes

The area has had many shed antlers, winter-killed deer, and pellet groups observed over the sample years.

## Soils

**Table 17-50.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.6 | 45.3 | 36.2 | 18.6 | 1.0 | 2.0 | 99.2 | 0.5 | 06/27/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 14 inches |
| NRCS Ecological Site | Upland Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC310UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

The plant community on this site has existed as a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) community type since study establishment in 1982, although cover has fluctuated slightly over the years. Moreover, sagebrush density has gradually, but steadily, decreased since 1995. Other browse species have also been present, but have not provided much cover (Photos, Table 17-50.12, Table 17-50.13). The herbaceous layer has remained fairly diverse and perennial grasses, namely crested wheatgrass (*Agropyron cristatum*), have been the main herbaceous component since 1988 (Pre-1992 Data). Since 1995, crested wheatgrass has increased in both abundance and cover (Table 17-50.10). Forbs have never been very abundant, but have mainly consisted of native species (Table 17-50.11). Photos and point-quarter data (Table 17-50.14) show that a small number of twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees have begun to encroach on the site. In the future, it is possible that pinyon and juniper could increase and eventually become dominant community components. The site has been considered to be within Early Phase I of woodland succession since 2000 (Table 17-50.4), however, indicating that further encroachment may not be an immediate concern.

Deer winter range condition on this site has fluctuated between poor and good since 1995; the study site was considered to be in fair condition in 2025. Improvement to deer winter range could be accomplished through efforts that support preferred browse reproduction and reduce decadence within the population. Diversifying and increasing the native perennial forb populations would also improve winter range conditions (Table 17-50.11, Table 17-50.13, Table 17-50.15). In addition, the sagebrush component of this site could provide valuable browse for deer and elk during the winter months (Table 17-50.3). Pellet transect data indicates that deer presence has been low in most years sampled including 2025. In contrast, elk presence has been relatively high and was at its highest in 2025 (Table 17-50.9). During the 2024/25 winter season the area had frequent occurrences of collared elk (Wildlife Migration Initiative). Sagebrush utilization has generally been high; over 70% of sagebrush plants sampled in density strips have been moderately to heavily browsed in most sample years since 1995 (Table 17-50.13). However, on-site observations in 2025 noted little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 17-50.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 11.2 | 0.8 | - | - | - | - |
| 2000 | 10.6 | 1.8 | - | - | - | - |
| 2005 | 7.6 | 1.2 | - | 7.0 | 0.7 | - |
| 2010 | 7.2 | 1.5 | - | 6.1 | 0.6 | - |
| 2015 | 5.1 | 1.1 | - | 5.2 | 0.7 | - |
| 2020 | 8.5 | 2.9 | - | 7.8 | 1.6 | - |
| 2025 | 7.6 | 1.9 | 0.0 | 7.3 | 1.0 | - |

**Table 17-50.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 408 | 8 | 210 | - | 12.8 | 0.0 | 4.3 |
| 2000 | - | 386 | 1 | 180 | - | 16.9 | 0.0 | 2.6 |
| 2005 | - | 344 | 81 | 176 | - | 19.9 | 1.8 | 4.3 |
| 2010 | - | 354 | 1 | 143 | - | 20.3 | 0.0 | 2.0 |
| 2015 | - | 397 | 11 | 152 | - | 22.0 | 0.0 | 1.2 |
| 2020 | - | 376 | - | 90 | - | 30.1 | - | 1.7 |
| 2025 | - | 387 | 1 | 125 | - | 21.7 | 0.0 | 1.8 |

**Table 17-50.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 32.3 | 1.4 | 39.1 | 0.0 | 0.2 | 31.8 |
| 2000 | 44.2 | 4.2 | 40.3 | 0.0 | - | 30.8 |
| 2005 | 49.6 | 3.4 | 25.3 | 0.0 | 0.0 | 31.0 |
| 2010 | 44.9 | 1.1 | 41.0 | 0.0 | 0.6 | 31.3 |
| 2015 | 45.5 | 3.0 | 30.7 | 0.2 | - | 29.8 |
| 2020 | 36.5 | 5.9 | 40.3 | 0.1 | 0.0 | 40.1 |
| 2025 | 42.2 | 3.0 | 37.6 | 0.2 | 0.0 | 31.5 |

**Table 17-50.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 29 | 17 | 4 |
| 2000 | 4 | 15 | 28 | 15 |
| 2005 | 2 | 31 | 45 | 12 |
| 2010 | 4 | 31 | 17 | 3 |
| 2015 | - | 4 | 69 | 45 |
| 2020 | 2 | 8 | 26 | 9 |
| 2025 | - | 12 | 50 | 11 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 8.0 (19.7) | 14.7 (36.4) | 31.5 (77.8) | - |
| 2005 | - | 28.1 (69.5) | 40.9 (101.0) | - |
| 2010 | 5.8 (14.3) | 11.4 (28.1) | 51.6 (127.5) | - |
| 2015 | - | 20.1 (49.7) | 54.9 (135.7) | - |
| 2020 | 1.5 (3.6) | 19.4 (48.0) | 38.9 (96.0) | - |
| 2025 | 6.5 (16.1) | 10.0 (24.8) | 74.4 (183.7) | - |

**Table 17-50.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Carex obtusata (obtuse sedge) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1995 | 10 | 399 | 10 | 16 | 13 | - |
| 2000 | 2 | 381 | 11 | 10 | 7 | - |
| 2005 | 34 | 311 | 5 | 34 | 22 | 1 |
| 2010 | 6 | 325 | 3 | 28 | 56 | 9 |
| 2015 | 8 | 371 | 19 | 16 | 40 | 4 |
| 2020 | 8 | 350 | 25 | 24 | 12 | 7 |
| 2025 | 3 | 353 | 35 | 54 | 26 | 15 |
| year | Average Cover (%) | | | | | |
| 1995 | 0.2 | 12.2 | 0.1 | 0.0 | 0.3 | - |
| 2000 | 0.0 | 16.7 | 0.1 | 0.1 | 0.1 | - |
| 2005 | 0.3 | 18.3 | 0.0 | 0.5 | 0.8 | 0.0 |
| 2010 | 0.0 | 18.4 | 0.0 | 0.5 | 1.2 | 0.1 |
| 2015 | 0.2 | 20.1 | 0.1 | 0.1 | 1.5 | 0.1 |
| 2020 | 0.7 | 27.6 | 0.6 | 0.5 | 0.7 | 0.0 |
| 2025 | 0.2 | 19.6 | 0.1 | 1.1 | 0.6 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-50.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium (onion) | Arabis drummondii (Drummond's rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (loosеflower milkvetch) | Calochortus nuttallii (sego lily) | Chaetopappa ericoides (rose heath) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cordylanthus kingii[a] (King's bird's-beak) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Lappula occidentalis[a] (flatspine stickseed) | Lygodesmia grandiflora (largeflower skeletonplant) | Machaeranthera canescens (hoary tansyaster) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 2 | - | 21 | 6 | 3 | - | - | 1 | 1 | 6 | - | - | 10 | 83 | 28 | 3 | 129 |
| 2000 | - | - | 19 | - | - | 8 | - | - | - | - | - | - | - | 78 | 10 | - | 117 |
| 2005 | - | - | 25 | 4 | 5 | 1 | 2 | - | 18 | - | 73 | 1 | 7 | 37 | 19 | 4 | 113 |
| 2010 | - | - | 20 | - | 3 | 3 | - | - | - | - | 1 | - | - | 27 | 11 | - | 87 |
| 2015 | - | - | - | - | - | 5 | - | - | - | - | 11 | 1 | 0 | 46 | 9 | 9 | 119 |
| 2020 | - | - | 6 | - | - | - | - | - | - | - | - | - | - | 32 | 1 | - | 58 |
| 2025 | - | 1 | 12 | - | - | - | - | - | - | - | 1 | - | - | 42 | 11 | - | 85 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | - | 0.8 | 0.2 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 2.0 | 0.1 | 0.0 | 1.0 |
| 2000 | - | - | 0.1 | - | - | 0.0 | - | - | - | - | - | - | - | 1.8 | 0.0 | - | 0.7 |
| 2005 | - | - | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.1 | - | 1.8 | 0.0 | 0.1 | 0.7 | 0.2 | 0.0 | 2.4 |
| 2010 | - | - | 0.1 | - | 0.0 | 0.0 | - | - | - | - | 0.0 | - | - | 0.5 | 0.0 | - | 0.8 |
| 2015 | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.5 |
| 2020 | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | 1.4 | 0.0 | - | 0.4 |
| 2025 | - | 0.0 | 0.0 | - | - | - | - | - | - | - | 0.0 | - | - | 1.2 | 0.0 | - | 0.4 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|
| year | Nested | |
| 1995 | - | 20 |
| 2000 | 1 | 11 |
| 2005 | - | 28 |
| 2010 | - | 30 |
| 2015 | - | 19 |
| 2020 | - | - |
| 2025 | - | 11 |
| year | Average Cover (%) | |
| 1995 | - | 0.2 |
| 2000 | 0.0 | 0.0 |
| 2005 | - | 0.4 |
| 2010 | - | 0.4 |
| 2015 | - | 0.2 |
| 2020 | - | - |
| 2025 | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-50.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. glabrata (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Purshia tridentata[p] (antelope bitterbrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 4.6 | 0.4 | 0.2 | 0.1 | - | 2.3 | - | 0.1 | - | - | - |
| 2010 | 5.5 | 0.2 | 0.1 | - | - | 0.6 | - | 0.3 | - | - | - |
| 2015 | 4.4 | 0.3 | - | - | - | 0.8 | - | 0.4 | - | - | - |
| 2020 | 6.4 | 0.3 | 0 | - | 0.1 | 1.4 | 0.2 | 1 | - | - | - |
| 2025 | 6.3 | 0.2 | - | - | 0.1 | 1 | - | 0.7 | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1995 | 10.2 | 0.3 | - | 0.3 | 0.1 | 0.6 | 0.0 | 0.4 | - | - | - |
| 2000 | 9.4 | 0.3 | 0.7 | 0.0 | - | 1.0 | - | 0.8 | 0.0 | - | 0.1 |
| 2005 | 5.7 | 0.3 | 0.0 | 0.0 | - | 1.9 | 0.0 | 0.9 | - | - | - |
| 2010 | 6.3 | 0.5 | 0.0 | - | 0.0 | 0.9 | 0.2 | 0.7 | - | - | - |
| 2015 | 4.4 | 0.3 | 0.0 | - | 0.0 | 0.7 | 0.0 | 0.8 | - | - | - |
| 2020 | 6.8 | 0.8 | 0.0 | - | 0.0 | 1.7 | 0.1 | 2.0 | - | - | - |
| 2025 | 6.4 | 0.0 | 0.0 | - | 0.2 | 1.2 | - | 1.7 | - | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-50.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 5420 | 180 | 16 | 76 | 8 | 66 | 17 | 6 | 45/77 |
| 2000 | 5020 | 100 | 15 | 63 | 22 | 53 | 24 | 14 | 45/66 |
| 2005 | 2960 | 300 | 18 | 41 | 41 | 27 | 22 | 30 | 46/68 |
| 2010 | 2500 | 40 | 18 | 48 | 34 | 38 | 39 | 38 | 43/68 |
| 2015 | 2100 | 20 | 10 | 41 | 50 | 20 | 76 | 38 | 35/57 |
| 2020 | 1980 | - | 27 | 55 | 18 | 15 | 1 | 18 | 44/65 |
| 2025 | 1500 | - | 5 | 68 | 27 | 16 | 79 | 39 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/17 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 300 | - | 0 | 100 | 0 | 0 | 0 | 0 | 34/42 |
| 2000 | 280 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 22/45 |
| 2005 | 320 | - | 25 | 75 | 0 | 0 | 0 | 0 | 29/35 |
| 2010 | 220 | - | 36 | 55 | 9 | 46 | 9 | 9 | 27/35 |
| 2015 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/38 |
| 2020 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/38 |
| 2025 | 180 | - | 0 | 100 | 0 | 56 | 22 | 0 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 19/36 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 39/55 |
| 2020 | - | - | - | - | - | - | - | - | 49/62 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. nauseosa var. glabrata -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 240 | - | 17 | 67 | 17 | 8 | 8 | 8 | 50/55 |
| 2005 | - | - | - | - | - | - | - | - | 45/44 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 50/62 |
| 2020 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 66/75 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 200 | - | 10 | 80 | 10 | 0 | 0 | 10 | 50/51 |
| 2000 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 120 | - | 0 | 67 | 33 | 33 | 17 | 33 | 45/46 |
| 2010 | 60 | - | 0 | 67 | 33 | 33 | 0 | 33 | 59/53 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/15 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | 16/25 |
| 2010 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 15/17 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 19/42 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/21 |
| 2025 | 400 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1995 | 1040 | 60 | 8 | 90 | 2 | 8 | 2 | 4 | 28/34 |
| 2000 | 1100 | - | 4 | 91 | 6 | 44 | 46 | 4 | 18/19 |
| 2005 | 1700 | 1840 | 31 | 66 | 4 | 35 | 22 | 1 | 24/33 |
| 2010 | 1960 | 40 | 48 | 52 | 0 | 24 | 22 | 7 | 17/22 |
| 2015 | 1780 | - | 32 | 67 | 1 | 14 | 53 | 7 | 14/21 |
| 2020 | 1620 | - | 33 | 67 | 0 | 32 | 5 | 0 | 29/34 |
| 2025 | 1480 | - | 20 | 80 | 0 | 16 | 19 | 0 | - / - |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | 60 | 40 | 100 | 0 | 0 | 0 | 0 | 0 | 4/8 |
| 2000 | - | 60 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 240 | - | 8 | 92 | 0 | 8 | 0 | 17 | 4/12 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 4/10 |
| 2020 | 460 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/17 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 940 | 20 | 11 | 85 | 4 | 0 | 0 | 4 | 12/29 |
| 2000 | 1180 | - | 12 | 80 | 9 | 0 | 0 | 9 | 11/24 |
| 2005 | 520 | 20 | 4 | 89 | 8 | 0 | 0 | 4 | 10/31 |
| 2010 | 520 | - | 4 | 92 | 4 | 0 | 0 | 8 | 11/27 |
| 2015 | 920 | 20 | 2 | 98 | 0 | 2 | 0 | 4 | 12/32 |
| 2020 | 760 | - | 5 | 95 | 0 | 0 | 0 | 0 | 12/35 |
| 2025 | 1200 | 40 | 0 | 90 | 10 | 0 | 0 | 13 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 50 | 0 | 50 | 0 | 0 | 50 | 1/5 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/6 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/6 |
| 2015 | - | - | - | - | - | - | - | - | 2/12 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

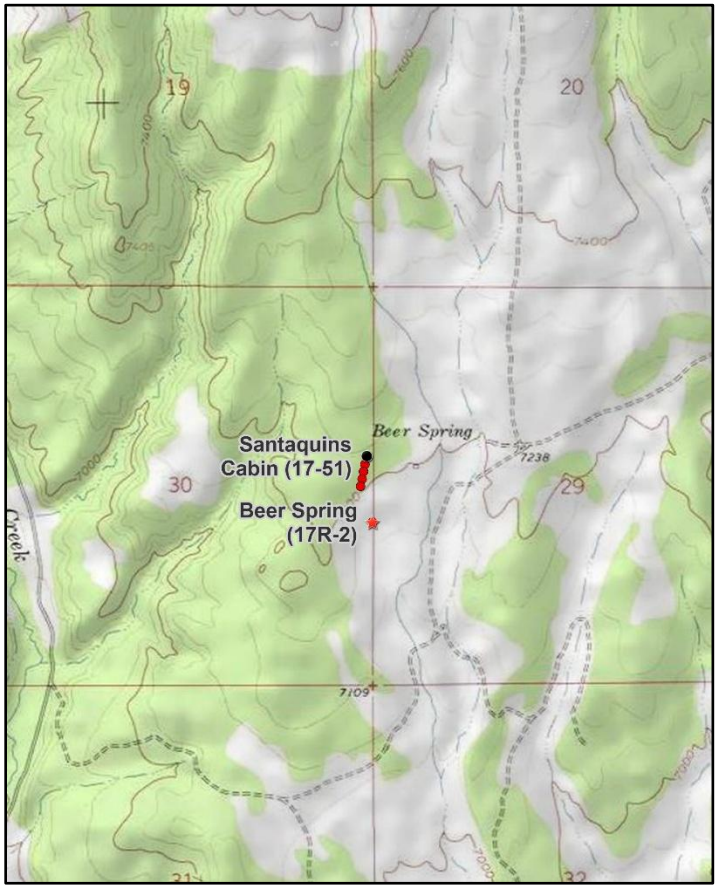
**Table 17-50.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

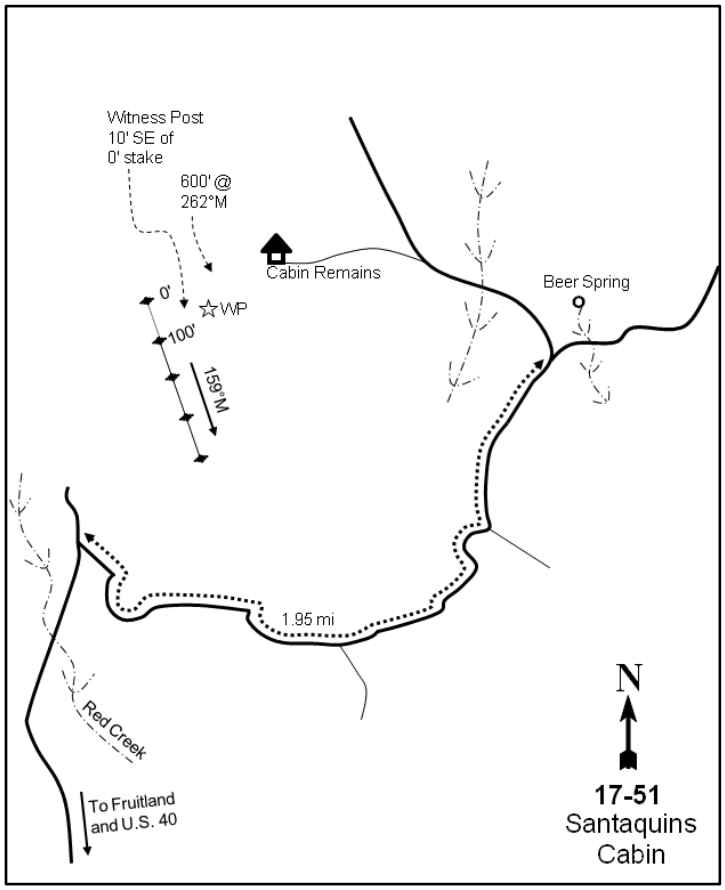
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 5 | - | 100 | - | - | - | 16.0 |
| 2020 | 5 | - | 67 | 33 | - | - | 13.3 |
| 2025 | 5 | - | 67 | 33 | - | - | 10.7 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 1 | - | 100 | - | - | - | 2.0 |
| 2020 | 1 | - | 100 | - | - | - | 5.0 |
| 2025 | 5 | - | 100 | - | - | - | 1.5 |

**Table 17-50.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 14.0 | 12.7 | 7.8 | 25.6 | 0.0 | 8.5 | 0.0 | **68.6** | Good |
| 2000 | 13.3 | 8.8 | 6.9 | 30.0 | 0.0 | 5.2 | 0.0 | **64.2** | Fair-Good |
| 2005 | 8.8 | 6.4 | 10.8 | 30.0 | 0.0 | 8.6 | 0.0 | **64.6** | Fair-Good |
| 2010 | 7.6 | 5.7 | 10.3 | 30.0 | 0.0 | 3.9 | 0.0 | **57.5** | Fair |
| 2015 | 6.5 | 2.4 | 6.4 | 30.0 | 0.0 | 2.4 | 0.0 | **47.7** | Poor |
| 2020 | 9.8 | 10.5 | 14.2 | 30.0 | 0.0 | 3.5 | 0.0 | **68.0** | Good |
| 2025 | 9.1 | 8.1 | 3.7 | 30.0 | 0.0 | 3.5 | 0.0 | **54.4** | Fair |

# SANTAQUINS CABIN - STUDY NO. 17-51




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tabby Mountain SW; Township 2S, Range 8W, Section 30 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 515174 East 4458691 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7022 |
| Transect Bearing | 175° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (19ft & 94ft), Line 2 (29ft), Line 3 (57ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from U.S. 40 in Fruitland, travel north up 45000 South for 1.8 miles to a three-way fork. Take the middle fork and go 2.5 miles. After crossing Red Creek, turn right onto a dirt road. Travel northeast up this road for 1.95 miles, keeping left at two major forks. At Beer Spring, turn left and travel along the west side of the fenced spring to a wide, shallow wash. Cross the wash, then bear left onto a faint road. Follow the road for about 100 yards to the remains of Santaquin's cabin. From the cabin, walk west at 262 degrees magnetic for 600 feet, following the old line-intercept study, to the fourth stake. From the fourth line-intercept stake, walk 11 paces south to the start of the baseline. The 0-foot baseline stake is marked with red browse tag #7022. There is a witness post southeast of the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 7,210ft (2,198m) |
| Aspect | Southeast |
| Slope | 5% |
| Sample Dates | 07/27/1995, 08/07/2000, 06/22/2005, 07/07/2010, 06/15/2015, 07/28/2020, 07/29/2025 |

**Table 17-51.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Chaining - Chain Unknown | - | - | Historic | - |
| Seeding - Seed Unknown | - | - | Historic | - |
| Disc - Disc Unknown | - | - | Fall 1995 | 270 |
| Seeding - Seed Unknown | - | - | Fall 1995 | 270 |
| Hand Crew - Lop and Scatter | Coyote Draw Pinyon and Juniper Thinning | 328 | July 2006-June 2007 | 1240 |

## Wildlife Habitat and Vegetation History

**Table 17-51.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | crucial | winter |

**Table 17-51.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 1995 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2000 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2010 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2015 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

Grazing is managed by the DWR for spring grazing (April/May) to promote browse growth and establishment.

## Soils

**Table 17-51.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.7 | 49.6 | 27.1 | 23.3 | 3.0 | 3.3 | 134.4 | 0.8 | 08/07/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Upland Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC310UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

Since study establishment in 1982, this site has existed as mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*)-dominated plant community; sagebrush cover has generally increased since site establishment (Table 17-51.12). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been present throughout the study period, but their density decreased following a 2006 lop and scatter treatment (Table 17-51.1, Table 17-51.13, Table 17-51.14). Perennial grasses have dominated the herbaceous understory since 1988 with the introduced species crested wheatgrass (*Agropyron cristatum*) as the most abundant species (Pre-1992 Data, Table 17-51.10). Forbs, while diverse, have lacked in abundance throughout the duration of the study (Table 17-51.11). Although pinyon and juniper have been targeted for removal in the past, there is potential for infilling in the future without continued maintenance. However, the site has remained within Early Phase I throughout the duration of the study (Table 17-51.4), indicating that infilling may not be an immediate concern. The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed with low abundance in the understory in some years, but it was not recorded in cover or frequency data in 2020 or 2025 (Table 17-51.10).

Deer winter range condition on this site has fluctuated between fair-good and good-excellent since 1995; the study site was considered to be in good condition in 2025. Improvement to deer winter range could be accomplished through efforts that support diversifying and increasing native perennial forb populations (Table 17-51.11, Table 17-51.15). The sagebrush component of this site could provide valuable browse for deer and elk during the winter months (Table 17-51.3). Pellet transect data indicates that deer presence has ranged between moderate and high in all years since 2000, while elk presence has ranged between low and moderate over the same timeframe (Table 17-51.9). During the 2024/25 winter season the area had frequent occurrences of collared mule deer (Wildlife

Migration Initiative). Sagebrush utilization has fluctuated from year to year. In 2025, 74% of sagebrush plants sampled in density strips were moderately to heavily browsed (Table 17-51.13). However, on-site observations in 2025 noted moderate utilization (20-40%) on crested wheatgrass and Russian wildrye (*Psathyrostachys juncea*), but little to no utilization on forb species.

## Trend Summary Tables

**Table 17-51.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 10.9 | 0.6 | - | - | - | - |
| 2000 | 8.6 | 1.9 | 0.0 | - | - | - |
| 2005 | 9.4 | 1.5 | 0.2 | 9.0 | 1.3 | 0.6 |
| 2010 | 9.5 | 2.6 | - | 12.6 | 1.9 | 0.4 |
| 2015 | 9.0 | 0.4 | 0.1 | 12.3 | 0.6 | 0.4 |
| 2020 | 12.4 | 2.8 | - | 15.2 | 1.5 | - |
| 2025 | 16.8 | 1.8 | - | 17.7 | 1.1 | - |

**Table 17-51.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 385 | 68 | 163 | - | 10.7 | 0.5 | 4.0 |
| 2000 | - | 363 | - | 133 | - | 17.3 | - | 2.1 |
| 2005 | 13 | 323 | 71 | 100 | 0.1 | 16.1 | 0.6 | 2.1 |
| 2010 | 24 | 349 | 40 | 100 | 0.1 | 17.3 | 0.2 | 1.9 |
| 2015 | 8 | 378 | 41 | 86 | 0.0 | 21.0 | 0.3 | 0.5 |
| 2020 | - | 355 | - | 40 | - | 27.1 | - | 0.3 |
| 2025 | - | 366 | 30 | 73 | - | 15.9 | 0.1 | 0.7 |

**Table 17-51.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 27.4 | 1.2 | 44.6 | 0.1 | 0.0 | 28.9 |
| 2000 | 31.8 | 1.0 | 59.5 | 0.8 | 0.0 | 34.9 |
| 2005 | 49.0 | 1.2 | 33.6 | 0.1 | - | 27.9 |
| 2010 | 37.0 | 0.7 | 50.6 | 0.1 | - | 34.0 |
| 2015 | 35.4 | 1.8 | 43.8 | 0.3 | 0.0 | 32.5 |
| 2020 | 33.5 | 2.1 | 55.1 | 1.9 | 0.3 | 38.2 |
| 2025 | 33.5 | 2.1 | 47.6 | 0.3 | 0.1 | 34.9 |

**Table 17-51.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 47 | 6 | 18 |
| 2000 | 4 | 55 | 2 | 24 |
| 2005 | 1 | 37 | 28 | 27 |
| 2010 | 1 | 50 | 19 | 25 |
| 2015 | 1 | 37 | 21 | 66 |
| 2020 | 3 | 37 | 5 | 17 |
| 2025 | 4 | 44 | 14 | 27 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 8.7 (21.5) | 138.7 (342.6) | 4.0 (9.9) | - |
| 2005 | 5.8 (14.3) | 61.7 (152.3) | 51.6 (127.5) | - |
| 2010 | 5.1 (12.6) | 22.1 (54.6) | 31.5 (77.8) | - |
| 2015 | - | 83.8 (206.9) | 9.4 (23.2) | - |
| 2020 | 9.4 (23.3) | 102.6 (253.3) | 8.7 (21.5) | - |
| 2025 | 6.5 (16.1) | 91.1 (225.1) | 14.7 (36.4) | - |

**Table 17-51.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex obtusata (obtuse sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Festuca idahoensis (Idaho fescue) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 71 | 191 | 49 | - | 71 | 16 | 126 | 3 | 23 | 5 | 7 | 94 |
| 2000 | 22 | 154 | 29 | - | 67 | 10 | 155 | - | 26 | 1 | 3 | 51 |
| 2005 | 58 | 173 | 3 | 13 | 27 | 9 | 107 | 6 | 35 | 17 | 18 | 15 |
| 2010 | 32 | 240 | 13 | 24 | 58 | 0 | 107 | 1 | 16 | 3 | 14 | 42 |
| 2015 | 32 | 242 | 11 | 8 | 90 | 3 | 129 | - | 72 | 3 | 21 | 19 |
| 2020 | 17 | 279 | 11 | - | 44 | 5 | 66 | - | 31 | 3 | 19 | - |
| 2025 | 12 | 214 | 1 | - | 82 | 3 | 118 | - | 26 | 7 | 31 | 2 |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 0.9 | 3.8 | 0.8 | - | 1.3 | 0.1 | 1.8 | 0.0 | 0.2 | 0.0 | 0.1 | 1.7 |
| 2000 | 0.4 | 7.9 | 0.8 | - | 2.1 | 0.3 | 4.3 | - | 0.4 | 0.0 | 0.1 | 0.9 |
| 2005 | 1.3 | 8.3 | 0.0 | 0.1 | 0.4 | 0.1 | 3.4 | 0.0 | 0.7 | 0.3 | 1.4 | 0.2 |
| 2010 | 0.8 | 9.6 | 0.3 | 0.1 | 0.5 | 0.0 | 4.3 | 0.0 | 0.4 | 0.0 | 1.0 | 0.2 |
| 2015 | 0.8 | 9.8 | 0.2 | 0.0 | 1.9 | 0.2 | 2.5 | - | 3.6 | 0.0 | 1.5 | 0.5 |
| 2020 | 0.7 | 19.8 | 0.3 | - | 1.4 | 0.3 | 2.6 | - | 0.5 | 0.0 | 1.4 | - |
| 2025 | 0.4 | 6.8 | 0.1 | - | 2.8 | 0.1 | 2.9 | - | 1.4 | 0.0 | 1.2 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-51.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Antennaria (pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (looseflower milkvetch) | Calochortus nuttallii (sego lily) | Castilleja (Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) | Cordylanthus kingii[a] (King's bird's-beak) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Descurainia pinnata[a] (western tansymustard) | Erigeron (fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | 6 | 24 | 9 | - | - | 14 | 3 | 2 | 27 | - | 4 | 2 | 7 |
| 2000 | 3 | - | 1 | - | 4 | 13 | - | - | - | - | - | 1 | - | 3 | - | - | 10 |
| 2005 | - | - | - | - | 11 | 0 | 5 | 0 | - | 27 | 5 | 3 | 5 | 3 | 2 | 2 | 1 |
| 2010 | - | - | - | - | 13 | 2 | 3 | - | - | - | 7 | - | 16 | - | - | - | - |
| 2015 | - | - | - | - | - | 4 | - | - | - | - | - | - | - | 3 | 1 | 15 | - |
| 2020 | - | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 5 | - | - | - |
| 2025 | - | 12 | - | 1 | 3 | 3 | - | - | 17 | - | - | - | 3 | 2 | 3 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | 0.1 | 0.3 | 0.0 | - | - | 0.1 | 0.0 | 0.0 | 0.3 | - | 0.0 | 0.0 | 0.0 |
| 2000 | 0.0 | - | 0.0 | - | 0.0 | 0.2 | - | - | - | - | - | 0.0 | - | 0.0 | - | - | 0.1 |
| 2005 | - | - | - | - | 0.1 | 0.0 | 0.0 | 0.0 | - | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2010 | - | - | - | - | 0.1 | 0.0 | 0.0 | - | - | - | 0.0 | - | 0.1 | - | - | - | - |
| 2015 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | 0.0 | 0.0 | 0.1 | - |
| 2020 | - | - | - | - | - | 0.0 | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - |
| 2025 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Hedysarum boreale (Utah sweetvetch) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Medicago sativa[i] (alfalfa) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Penstemon humilis (low beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sisymbrium altissimum[ai] (tall tumblemustard) | Sphaeralcea coccinea (scarlet globemallow) | Taraxacum officinale (common dandelion) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | |
| 1995 | - | 19 | 5 | 29 | - | 5 | 8 | 16 | 1 | 11 | 4 | 2 | 77 | 5 | 13 |
| 2000 | 4 | - | 4 | 27 | - | - | 15 | 21 | - | - | - | - | 69 | - | - |
| 2005 | - | 28 | 10 | 8 | 5 | - | 2 | - | - | 10 | - | 6 | 66 | - | 11 |
| 2010 | - | 15 | 3 | 4 | - | - | 10 | 7 | - | 2 | 0 | - | 69 | - | 6 |
| 2015 | 5 | 23 | - | 0 | - | - | 12 | 8 | - | 1 | - | 3 | 62 | - | 3 |
| 2020 | - | - | 3 | - | 3 | - | - | 7 | - | - | 0 | - | 26 | - | - |
| 2025 | - | 3 | 5 | - | - | - | 8 | 8 | 1 | - | 0 | - | 43 | - | 12 |
| year | Average Cover (%) | | | | | | | | | | | | | | |
| 1995 | - | 0.1 | 0.1 | 1.7 | - | 0.0 | 0.1 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.2 |
| 2000 | 0.1 | - | 0.0 | 0.6 | - | - | 0.2 | 0.4 | - | - | - | - | 0.4 | - | - |
| 2005 | - | 0.3 | 0.1 | 0.3 | 0.0 | - | 0.1 | - | - | 0.0 | - | 0.0 | 1.2 | - | 0.2 |
| 2010 | - | 0.1 | 0.0 | 0.2 | - | - | 0.1 | 0.0 | - | 0.0 | 0.0 | - | 1.4 | - | 0.0 |
| 2015 | 0.0 | 0.2 | - | 0.0 | - | - | 0.1 | 0.0 | - | 0.0 | - | 0.0 | 0.3 | - | 0.0 |
| 2020 | - | - | 0.1 | - | 0.0 | - | - | 0.0 | - | - | 0.0 | - | 0.1 | - | - |
| 2025 | - | 0.0 | 0.2 | - | - | - | 0.1 | 0.1 | 0.0 | - | 0.0 | - | 0.3 | - | 0.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-51.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. glabrata (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Ericameria parryi var. parryi (Parry's rabbitbrush) | Eriogonum corymbosum (crispleaf buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 8.4 | 0.2 | - | - | - | 0.4 | 1 | 0.3 | - | 0.3 | - | 0 | - | 0.3 |
| 2010 | 12.5 | - | - | - | 0.3 | 0.1 | 1 | 0.3 | 0.2 | - | - | 0.1 | - | 0.4 |
| 2015 | 12.1 | - | - | - | - | 0.2 | 0.4 | 0.1 | - | - | - | 0.1 | - | 0.4 |
| 2020 | 14.9 | - | - | 0.2 | 0.2 | 0.3 | 0.5 | - | 0.6 | - | - | 0 | - | - |
| 2025 | 17.1 | 0.5 | - | - | 0.2 | 0.1 | 0.3 | - | 0.2 | - | - | 0.4 | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | | |
| 1995 | 9.6 | - | 0.2 | - | - | 1.2 | - | 0.1 | 0.2 | - | 0.2 | 0.0 | 0.0 | - |
| 2000 | 8.3 | - | 0.2 | - | 0.1 | 0.1 | 1.0 | 0.1 | 0.2 | 0.0 | 0.1 | 0.2 | - | - |
| 2005 | 8.5 | 0.4 | 0.1 | 0.0 | - | 0.4 | 1.3 | 0.0 | - | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 |
| 2010 | 9.1 | - | 0.1 | - | 0.2 | 0.2 | 1.2 | 0.7 | 0.2 | - | 0.0 | 0.3 | 0.0 | 0.0 |
| 2015 | 8.5 | 0.0 | 0.1 | - | 0.1 | 0.3 | 0.1 | 0.0 | - | - | - | 0.2 | 0.0 | 0.1 |
| 2020 | 11.5 | - | 0.1 | 0.0 | 0.4 | 0.8 | 0.8 | 0.1 | 0.9 | - | - | 0.6 | - | - |
| 2025 | 16.3 | 0.1 | 0.1 | - | 0.2 | 0.1 | 0.8 | 0.0 | 0.5 | - | - | 0.2 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-51.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 3040 | 20 | 17 | 76 | 7 | 42 | 16 | 2 | 86/99 |
| 2000 | 2320 | 120 | 19 | 73 | 8 | 32 | 4 | 4 | 46/63 |
| 2005 | 2160 | 10940 | 32 | 46 | 21 | 19 | 30 | 19 | 62/77 |
| 2010 | 5740 | 800 | 49 | 47 | 4 | 16 | 38 | 7 | 59/78 |
| 2015 | 5040 | 180 | 41 | 46 | 14 | 28 | 53 | 13 | 50/70 |
| 2020 | 3600 | - | 41 | 50 | 9 | 24 | 18 | 13 | 53/74 |
| 2025 | 4140 | 580 | 26 | 60 | 14 | 33 | 41 | 33 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 81/81 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 74/86 |
| 2010 | - | - | - | - | - | - | - | - | 42/66 |
| 2015 | 100 | - | 80 | 0 | 20 | 0 | 100 | 20 | 55/69 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 45/57 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 300 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/39 |
| 2000 | 260 | - | 0 | 92 | 8 | 39 | 15 | 0 | 4/16 |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/59 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 8/40 |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 10/88 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 28/39 |
| 2000 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | - / - |
| 2005 | 160 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 26/32 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/46 |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 36/47 |
| 2020 | 40 | - | 0 | 100 | 0 | 50 | 0 | 0 | 25/29 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 39/71 |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 35/46 |
| 2005 | 60 | - | 33 | 67 | 0 | 33 | 33 | 0 | 33/44 |
| 2010 | 80 | 20 | 0 | 75 | 25 | 0 | 0 | 25 | 37/64 |
| 2015 | 20 | - | 0 | 0 | 100 | 0 | 100 | 100 | - / - |
| 2020 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 38/64 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Ericameria nauseosa ssp. nauseosa var. glabrata -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | - | 0 | 50 | 50 | 0 | 0 | 25 | 61/67 |
| 2005 | - | - | - | - | - | - | - | - | 41/64 |
| 2010 | 260 | - | 8 | 85 | 8 | 15 | 0 | 8 | 46/52 |
| 2015 | 80 | - | 25 | 50 | 25 | 50 | 50 | 25 | 32/40 |
| 2020 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 64/59 |
| 2025 | 220 | - | 9 | 82 | 9 | 9 | 64 | 9 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 2360 | - | 9 | 91 | 0 | 0 | 0 | 0 | 35/39 |
| 2000 | 260 | - | 31 | 69 | 0 | 8 | 0 | 15 | 50/54 |
| 2005 | 240 | - | 33 | 50 | 17 | 8 | 25 | 17 | 45/50 |
| 2010 | 220 | - | 0 | 100 | 0 | 0 | 0 | 0 | 51/59 |
| 2015 | 360 | - | 17 | 33 | 50 | 0 | 89 | 28 | 52/57 |
| 2020 | 300 | - | 20 | 73 | 7 | 13 | 20 | 13 | 48/47 |
| 2025 | 100 | - | 40 | 60 | 0 | 0 | 20 | 0 | - / - |
| Ericameria parryi var. parryi -- (Parry's rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 1880 | - | 2 | 98 | 0 | 43 | 1 | 0 | 15/22 |
| 2005 | 1240 | 220 | 11 | 89 | 0 | 0 | 5 | 0 | 16/28 |
| 2010 | 1480 | - | 4 | 96 | 0 | 0 | 0 | 0 | 23/29 |
| 2015 | 880 | 80 | 14 | 86 | 0 | 25 | 71 | 0 | 12/19 |
| 2020 | 980 | - | 10 | 90 | 0 | 0 | 6 | 0 | 19/30 |
| 2025 | 820 | - | 15 | 85 | 0 | 22 | 42 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 680 | - | 6 | 94 | 0 | 0 | 0 | 0 | 24/27 |
| 2000 | 860 | - | 2 | 98 | 0 | 0 | 0 | 0 | 9/14 |
| 2005 | 120 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 18/31 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/24 |
| 2015 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/21 |
| 2020 | 420 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 17/26 |
| 2025 | 880 | - | 18 | 82 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | - | 75 | 25 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 100 | - | 60 | 40 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 46/55 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/17 |
| 2000 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 8/15 |
| 2005 | 100 | 20 | 20 | 80 | 0 | 0 | 0 | 0 | 6/20 |
| 2010 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/17 |
| 2015 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 120 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/35 |
| 2000 | 220 | - | 27 | 64 | 9 | 0 | 0 | 0 | 11/31 |
| 2005 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | 11/31 |
| 2010 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 11/33 |
| 2015 | 140 | 20 | 0 | 86 | 14 | 43 | 0 | 14 | 11/27 |
| 2020 | 160 | - | 13 | 88 | 0 | 0 | 0 | 0 | 9/27 |
| 2025 | 220 | - | 0 | 64 | 36 | 0 | 0 | 46 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/8 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 2/5 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 2/7 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 100 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 36/30 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 55/68 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

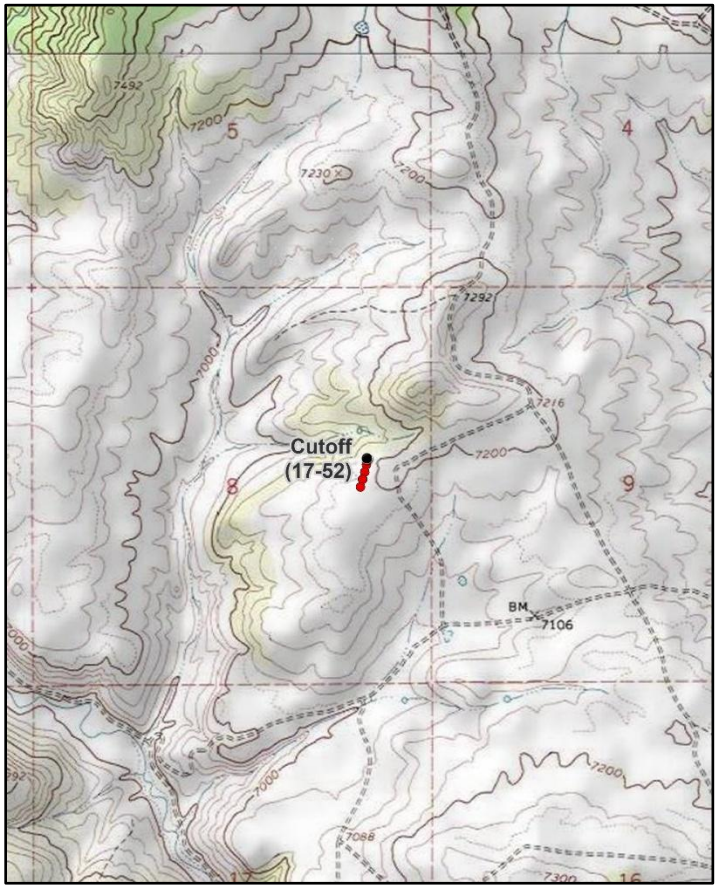
**Table 17-51.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

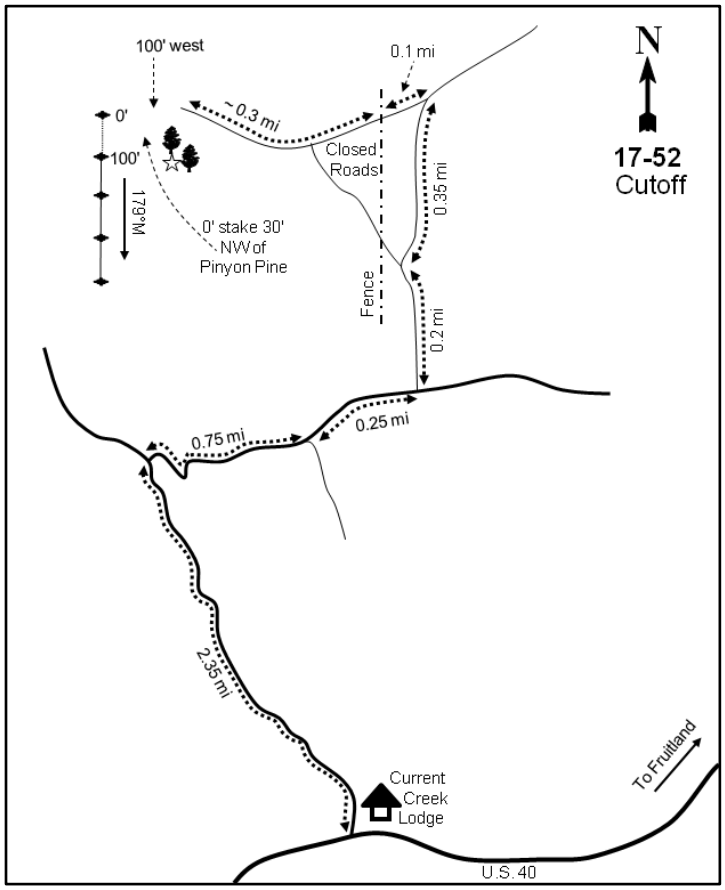
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 51 | - | - | - | - | - | 5.3 |
| 2000 | 21 | - | - | - | - | - | 3.9 |
| 2005 | 29 | - | 56 | 25 | 19 | - | 9.6 |
| 2010 | 7 | 33 | 50 | 17 | - | - | 3.3 |
| 2015 | 12 | - | 100 | - | - | - | 3.1 |
| 2020 | 10 | - | 86 | 14 | - | - | 5.4 |
| 2025 | 10 | - | 71 | 29 | - | - | 4.9 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 54 | - | - | - | - | - | 3.6 |
| 2000 | 28 | - | - | - | - | - | 2.9 |
| 2005 | 32 | 22 | 56 | 22 | - | - | 5.3 |
| 2010 | 175 | 33 | 33 | 33 | - | - | 2.7 |
| 2015 | 15 | - | 75 | 25 | - | - | 4.8 |
| 2020 | 19 | 67 | 33 | - | - | - | 3.0 |
| 2025 | 7 | - | 100 | - | - | - | 2.7 |

**Table 17-51.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 13.6 | 13.1 | 8.0 | 21.4 | 0.0 | 8.0 | 0.0 | **64.1** | Fair-Good |
| 2000 | 10.7 | 12.6 | 9.3 | 30.0 | 0.0 | 4.2 | 0.0 | **66.8** | Fair-Good |
| 2005 | 11.3 | 8.7 | 15.0 | 30.0 | -0.1 | 4.2 | 0.0 | **69.1** | Good |
| 2010 | 15.8 | 13.9 | 15.0 | 30.0 | -0.1 | 3.8 | 0.0 | **78.4** | Good-Excellent |
| 2015 | 15.4 | 10.8 | 15.0 | 30.0 | 0.0 | 1.1 | 0.0 | **72.3** | Good |
| 2020 | 19.0 | 12.4 | 15.0 | 30.0 | 0.0 | 0.6 | 0.0 | **77.0** | Good |
| 2025 | 22.1 | 11.1 | 12.7 | 30.0 | 0.0 | 1.3 | 0.0 | **77.2** | Good |

# CUTOFF - STUDY NO. 17-52




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Deep Creek Canyon NE; Township 3S, Range 9W, Section 08 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 506921 East 4453859 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 9173 |
| Transect Bearing | 184° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (6ft & 90ft), Line 2 (26ft), Line 3 (57ft), Line 4 (69ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from the intersection of Currant Creek Road and Highway U.S. 40, travel north on Currant Creek Road for 2.4 miles. Turn right and travel east for 0.8 miles to an intersection. Turn left and drive north for 0.3 miles to a "T" intersection. At the "T," turn left and travel 0.2 miles to a fork. Stay right for another 0.4 miles to another fork. Turn left and drive to the fence. Cross the fence and walk to the end of the road (about a third of a mile) to the west. The 0-foot baseline stake is 100 feet west of the end of the road and about 30 feet northwest of a mature twoneedle pinyon (*Pinus edulis*).

## Site Information

| | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | No data |
| Elevation | 7,200ft (2,195m) |
| Aspect | West |
| Slope | 10% |
| Sample Dates | 07/28/1995, 06/30/2000, 08/02/2005, 07/01/2010, 06/17/2015, 07/29/2020, 07/30/2025 |

## Wildlife Habitat and Vegetation History

**Table 17-52.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | crucial | winter |

**Table 17-52.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Mountain Big Sagebrush | Early Phase I |
| 1988 | Mountain Big Sagebrush | Early Phase I |
| 1995 | Mountain Big Sagebrush | Early Phase I |
| 2000 | Mountain Big Sagebrush | Early Phase I |
| 2005 | Mountain Big Sagebrush | Early Phase I |
| 2010 | Mountain Big Sagebrush | Early Phase I |
| 2015 | Mountain Big Sagebrush | Early Phase I |
| 2020 | Mountain Big Sagebrush | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

Belt 1 likely occurs in a browse ESD that is not currently defined for this MLRA.

## Soils

**Table 17-52.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.2 | 61.4 | 19.0 | 19.6 | 1.8 | 5.9 | 131.2 | 0.7 | 06/30/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Upland Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XC310UT |
| States and Transitions | 1982-2025 - Mountain Big Sagebrush-Steppe/Introduced Non-Natives State: Community Phase 2.1 |

The plant community on this site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) as the dominant species since study establishment in 1982. There have been additional browse species of value present, yet they have been less abundant than sagebrush (Photos, Pre-1992 Data, Table 17-52.12, Table 17-52.13). The herbaceous layer has fluctuated throughout the course of the study, but both grasses and forbs have remained diverse and abundant (Table 17-52.10, Table 17-52.11). The introduced annual grass species cheatgrass (*Bromus tectorum*) has been observed in the understory, but with low abundance and cover (Table 17-52.10). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) are scattered throughout the area (Photos). However, trees do not appear to be encroaching at any significant rate as of 2025 (Table 17-52.14); the site has remained in Early Phase I of woodland succession throughout the study period (Table 17-52.4).

Deer winter range condition on this site has fluctuated between fair and excellent since 1995; the study site was considered to be in good-excellent condition in 2025. Improvement to deer winter range could be accomplished through efforts that support preferred browse reproduction and reduce decadence within the population (Table 17-52.13, Table 17-52.15). The sagebrush component of this site could provide valuable browse for elk and deer during the winter months (Table 17-52.3). Pellet transect data indicates that deer presence has ranged between moderate and high during the sample period. However, elk presence has remained low over the same timeframe (Table 17-52.9). The area had frequent occurrences of collared mule deer during the 2024/25 winter season (Wildlife Migration Initiative). More than 60% of sagebrush plants sampled in density strips have shown signs of moderate to heavy utilization in most sample years since 1995, with 77% displaying that level of utilization in 2025 (Table 17-52.13). In contrast, on-site observations for 2025 note little to no utilization of the understory grass and forb components.

## Trend Summary Tables

**Table 17-52.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 13.0 | 1.1 | - | - | - | - |
| 2000 | 10.8 | 2.0 | - | - | - | - |
| 2005 | 11.1 | 1.8 | - | 18.4 | 4.5 | - |
| 2010 | 13.2 | 1.5 | - | 19.5 | 3.0 | - |
| 2015 | 10.8 | 1.6 | - | 15.0 | 2.7 | - |
| 2020 | 14.2 | 2.8 | - | 17.4 | 3.0 | - |
| 2025 | 14.8 | 2.1 | - | 16.6 | 1.8 | - |

**Table 17-52.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 3 | 381 | 202 | 290 | 0.0 | 9.5 | 3.0 | 9.0 |
| 2000 | 3 | 391 | 11 | 281 | 0.0 | 12.7 | 0.0 | 11.0 |
| 2005 | 12 | 375 | 229 | 271 | 0.2 | 10.9 | 3.8 | 8.3 |
| 2010 | 6 | 358 | 166 | 285 | 0.0 | 8.1 | 2.6 | 14.5 |
| 2015 | 4 | 400 | 105 | 312 | 0.0 | 19.9 | 1.5 | 12.2 |
| 2020 | 1 | 377 | 111 | 283 | 0.0 | 19.9 | 0.5 | 13.5 |
| 2025 | 13 | 373 | 110 | 308 | 0.1 | 18.1 | 1.7 | 13.9 |

**Table 17-52.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 33.8 | 5.2 | 35.3 | 0.3 | 0.2 | 32.1 |
| 2000 | 38.7 | 1.7 | 40.6 | 0.6 | 0.9 | 37.3 |
| 2005 | 41.4 | 1.8 | 30.7 | 1.4 | 0.5 | 37.2 |
| 2010 | 49.6 | 0.2 | 30.8 | 0.1 | 0.5 | 37.2 |
| 2015 | 48.0 | 0.5 | 29.7 | 0.5 | 1.0 | 41.8 |
| 2020 | 41.9 | 0.7 | 35.4 | 2.7 | 1.5 | 45.6 |
| 2025 | 32.8 | 2.6 | 39.3 | 0.6 | 0.6 | 40.2 |

**Table 17-52.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 44 | 3 | 25 |
| 2000 | - | 33 | 14 | 38 |
| 2005 | 3 | 50 | 14 | 75 |
| 2010 | 2 | 38 | 6 | 16 |
| 2015 | - | 27 | - | 63 |
| 2020 | - | 30 | 1 | 7 |
| 2025 | 1 | 30 | 11 | 28 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 2.9 (7.2) | 95.8 (236.7) | 8.1 (19.9) | - |
| 2005 | 10.9 (26.9) | 85.8 (211.9) | 16.1 (39.7) | - |
| 2010 | 8.7 (21.5) | 60.3 (149.0) | 22.1 (54.6) | - |
| 2015 | - | 41.5 (102.6) | - | - |
| 2020 | 0.7 (1.8) | 56.3 (139.0) | 6.7 (16.6) | - |
| 2025 | - | 26.8 (66.2) | 5.3 (13.2) | - |

**Table 17-52.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus tectorum[ai] (cheatgrass) | Carex obtusata (obtuse sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 1995 | 86 | - | 3 | 52 | 1 | 230 | 82 | 72 | 131 | 8 | 37 | - |
| 2000 | 75 | - | 3 | 48 | - | 186 | 18 | 21 | 8 | 200 | 57 | - |
| 2005 | 54 | - | 12 | 38 | - | 94 | 126 | 13 | 71 | 187 | 161 | - |
| 2010 | 20 | - | 6 | 22 | 2 | 191 | 90 | 15 | 31 | 224 | 36 | 1 |
| 2015 | 49 | 3 | 4 | 86 | - | 174 | 45 | 23 | 72 | 233 | 25 | - |
| 2020 | 35 | 7 | 1 | 75 | 3 | 252 | 54 | 1 | 51 | 220 | 7 | - |
| 2025 | 41 | - | 13 | 114 | - | 234 | 40 | - | 1 | 146 | 2 | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 1995 | 1.2 | - | 0.0 | 0.3 | 0.0 | 2.2 | 2.3 | 1.0 | 1.4 | 0.0 | 1.1 | - |
| 2000 | 1.8 | - | 0.0 | 0.3 | - | 2.7 | 0.4 | 0.8 | 0.2 | 5.3 | 1.2 | - |
| 2005 | 1.1 | - | 0.2 | 0.1 | - | 2.0 | 2.2 | 0.1 | 1.3 | 2.2 | 1.8 | - |
| 2010 | 0.1 | - | 0.0 | 0.2 | 0.0 | 2.3 | 1.4 | 0.2 | 0.4 | 3.0 | 0.5 | 0.0 |
| 2015 | 1.8 | 0.3 | 0.0 | 1.8 | - | 4.7 | 1.8 | 0.3 | 2.5 | 5.9 | 0.9 | - |
| 2020 | 1.5 | 0.1 | 0.0 | 1.3 | 0.1 | 9.1 | 1.5 | 0.1 | 1.3 | 4.9 | 0.1 | - |
| 2025 | 2.0 | - | 0.1 | 4.5 | - | 6.7 | 1.2 | - | 0.0 | 3.6 | 0.0 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-52.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Agoseris glauca (pale agoseris) | Allium acuminatum (tapertip onion) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria dimorpha (low pussytoes) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Artemisia dracunculus (tarragon) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus tenellus (looseflower milkvetch) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 3 | 108 | - | 41 | 50 | - | 5 | - | 3 | 152 | - | 4 | 4 | - | 9 | 7 | 12 |
| 2000 | - | - | - | - | 70 | - | 10 | 2 | 9 | 129 | - | 2 | 24 | - | 7 | - | - |
| 2005 | 8 | 64 | - | - | 14 | - | 25 | - | 2 | 137 | - | 8 | 3 | 4 | 1 | - | 7 |
| 2010 | 2 | 48 | - | 8 | 103 | - | - | - | 1 | 90 | - | 4 | 6 | 3 | - | 1 | 10 |
| 2015 | 1 | 13 | - | 69 | 96 | - | 8 | - | - | 73 | 3 | - | 14 | - | - | - | 1 |
| 2020 | 13 | - | - | - | 43 | - | 2 | - | - | 49 | - | - | 1 | - | - | - | - |
| 2025 | - | 15 | 30 | - | 61 | 4 | - | - | - | 73 | - | - | 4 | 27 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.5 | - | 0.1 | 0.5 | - | 0.0 | - | 0.6 | 3.8 | - | 0.0 | 0.1 | - | 0.0 | 0.0 | 0.0 |
| 2000 | - | - | - | - | 2.1 | - | 0.2 | 0.0 | 0.4 | 3.2 | - | 0.0 | 0.3 | - | 0.0 | - | - |
| 2005 | 0.0 | 0.2 | - | - | 0.3 | - | 0.1 | - | 0.0 | 2.8 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 |
| 2010 | 0.0 | 0.2 | - | 0.0 | 3.5 | - | - | - | 0.1 | 2.3 | - | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.1 |
| 2015 | 0.0 | 0.0 | - | 0.7 | 1.9 | - | 0.1 | - | - | 0.9 | 0.0 | - | 0.1 | - | - | - | 0.0 |
| 2020 | 0.0 | - | - | - | 1.2 | - | 0.0 | - | - | 0.3 | - | - | 0.0 | - | - | - | - |
| 2025 | - | 0.1 | 0.3 | - | 1.6 | 0.0 | - | - | - | 1.7 | - | - | 0.2 | 0.1 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Cordylanthus kingii[a] (King's bird's-beak) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) | Erigeron pumilus (shaggy fleabane) | Eriogonum cernuum[a] (nodding buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Hedysarum boreale (Utah sweetvetch) | Lappula occidentalis[a] (flatspine stickseed) | Lithospermum ruderale (western stoneseed) | Machaeranthera canescens (hoary tansyaster) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 67 | - | 85 | 9 | - | 24 | - | 11 | - | 28 | 3 | 8 | 34 | 20 | 3 | 19 |
| 2000 | 2 | - | - | 3 | 2 | - | 5 | - | - | - | 86 | - | - | 4 | - | 2 | 13 |
| 2005 | - | 112 | - | 129 | - | 0 | 14 | 1 | 26 | 17 | 58 | 1 | 11 | - | 25 | 2 | 16 |
| 2010 | - | 13 | 12 | 126 | 7 | 3 | 29 | - | - | 19 | 44 | 1 | 9 | - | 9 | 3 | 7 |
| 2015 | - | 2 | - | - | 12 | 13 | 16 | - | 8 | - | 102 | - | - | - | 42 | - | 5 |
| 2020 | - | 83 | - | 8 | 5 | 8 | 24 | - | 4 | 3 | 46 | - | - | - | - | 1 | - |
| 2025 | - | 46 | - | 25 | - | 5 | 34 | - | - | 12 | 55 | 3 | - | - | 1 | 3 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.2 | - | 2.3 | 0.2 | - | 0.1 | - | 0.1 | - | 0.1 | 0.0 | 0.1 | 0.6 | 0.1 | 0.0 | 0.1 |
| 2000 | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | - | - | - | 0.5 | - | - | 0.0 | - | 0.0 | 0.1 |
| 2005 | - | 0.6 | - | 2.9 | - | 0.0 | 0.1 | 0.0 | 0.1 | 0.4 | 0.5 | 0.0 | 0.0 | - | 0.1 | 0.1 | 0.2 |
| 2010 | - | 0.0 | 0.1 | 2.3 | 0.0 | 0.0 | 0.2 | - | - | 0.2 | 0.5 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 |
| 2015 | - | 0.0 | - | - | 0.1 | 0.3 | 0.1 | - | 0.2 | - | 0.9 | - | - | - | 0.6 | - | 0.0 |
| 2020 | - | 0.2 | - | 0.1 | 0.0 | 0.2 | 0.1 | - | 0.0 | 0.0 | 0.2 | - | - | - | - | 0.0 | - |
| 2025 | - | 0.7 | - | 0.4 | - | 0.2 | 0.2 | - | - | 0.1 | 0.7 | 0.0 | - | - | 0.0 | 0.0 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Machaeranthera grindelioides (rayless tansyaster) | Orogenia linearifolia (Great Basin Indian potato) | Packera multilobata (lobeleaf groundsel) | Penstemon (beardtongue) | Phlox hoodii (spiny phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum (aster) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1995 | - | - | - | 2 | 113 | 32 | 58 | 6 | 35 | - | 53 |
| 2000 | - | - | 6 | 1 | 146 | 16 | 8 | 3 | 33 | - | 32 |
| 2005 | - | - | 5 | - | 116 | 30 | 62 | 1 | 31 | - | 31 |
| 2010 | - | - | - | - | 157 | 15 | 37 | 9 | 30 | 4 | 51 |
| 2015 | - | 2 | 6 | 2 | 138 | 45 | - | 27 | 46 | - | 47 |
| 2020 | - | - | - | - | 186 | 24 | 58 | - | 42 | - | 13 |
| 2025 | 1 | 6 | 6 | - | 200 | 32 | 39 | 13 | 32 | - | 57 |
| year | Average Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | 0.0 | 1.6 | 0.1 | 0.1 | 0.0 | 0.5 | - | 0.2 |
| 2000 | - | - | 0.0 | 0.0 | 3.6 | 0.0 | 0.0 | 0.0 | 0.2 | - | 0.1 |
| 2005 | - | - | 0.0 | - | 2.8 | 0.2 | 0.1 | 0.0 | 0.1 | - | 0.2 |
| 2010 | - | - | - | - | 5.9 | 0.1 | 0.1 | 0.0 | 0.5 | 0.0 | 0.6 |
| 2015 | - | 0.0 | 0.0 | 0.0 | 5.9 | 0.5 | - | 0.1 | 0.4 | - | 0.7 |
| 2020 | - | - | - | - | 11.1 | 0.1 | 0.1 | - | 0.2 | - | 0.1 |
| 2025 | 0.0 | 0.0 | 0.0 | - | 7.4 | 0.4 | 0.2 | 0.1 | 0.1 | - | 1.1 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-52.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Eriogonum corymbosum (crispleaf buckwheat) | Krascheninnikovia lanata[p] (winterfat) | Opuntia fragilis (brittle pricklypear) | Opuntia polyacantha (plains pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 3.4 | 11.3 | 1.9 | 1.8 | 3.3 | 0.9 | 0 | 0.1 | - | 0.1 | 0.1 |
| 2010 | 3.5 | 12 | 1.6 | 2.4 | 1.9 | 0.7 | - | 0.1 | - | 0.1 | 0.2 |
| 2015 | 4 | 8.4 | 0.9 | 1.6 | 2.2 | 0.3 | 0.1 | 0.2 | - | 0 | - |
| 2020 | 4.6 | 8.8 | 1.8 | 2.2 | 2.5 | 0.5 | - | - | - | - | - |
| 2025 | 4.4 | 8.1 | 1.7 | 2.3 | 1.3 | 0.5 | 0.1 | - | - | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 1995 | 0.8 | 10.4 | 0.6 | 1.1 | 0.3 | 0.3 | - | 0.1 | - | - | 0.3 |
| 2000 | 2.4 | 7.1 | 0.7 | 0.6 | 0.8 | 0.3 | - | 0.2 | - | - | 0.8 |
| 2005 | 0.9 | 7.7 | 0.7 | 1.8 | 0.9 | 0.5 | 0.0 | 0.1 | - | 0.0 | 0.3 |
| 2010 | 2.4 | 8.8 | 0.3 | 1.6 | 0.6 | 0.4 | - | 0.1 | - | 0.0 | 0.3 |
| 2015 | 2.3 | 6.8 | 0.3 | 1.4 | 1.0 | 0.5 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| 2020 | 3.3 | 7.3 | 0.8 | 2.8 | 0.9 | 0.9 | - | 0.1 | 0.1 | 0.0 | 0.8 |
| 2025 | 3.2 | 7.0 | 0.6 | 4.0 | 0.7 | 0.8 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-52.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | 320 | - | 19 | 81 | 0 | 38 | 0 | 0 | 57/66 |
| 2000 | 520 | 140 | 54 | 42 | 4 | 4 | 15 | 4 | 72/81 |
| 2005 | 540 | - | 59 | 30 | 11 | 44 | 15 | 0 | 83/92 |
| 2010 | 380 | 20 | 53 | 47 | 0 | 21 | 0 | 0 | 63/77 |
| 2015 | 480 | - | 50 | 46 | 4 | 29 | 33 | 0 | 61/72 |
| 2020 | 380 | - | 53 | 47 | 0 | 26 | 16 | 0 | 79/101 |
| 2025 | 360 | - | 39 | 56 | 6 | 33 | 44 | 17 | - / - |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 3000 | 20 | 16 | 45 | 39 | 28 | 47 | 21 | 50/87 |
| 2000 | 2980 | 20 | 5 | 50 | 45 | 28 | 53 | 14 | 47/75 |
| 2005 | 2420 | 2760 | 4 | 45 | 51 | 22 | 55 | 18 | 56/90 |
| 2010 | 2940 | 2040 | 23 | 61 | 16 | 22 | 48 | 18 | 55/85 |
| 2015 | 2960 | 180 | 26 | 51 | 23 | 20 | 68 | 20 | 48/78 |
| 2020 | 2620 | 40 | 24 | 48 | 28 | 12 | 29 | 35 | 50/79 |
| 2025 | 2520 | 520 | 13 | 53 | 34 | 48 | 26 | 41 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 260 | - | 8 | 92 | 0 | 39 | 0 | 0 | 55/78 |
| 2000 | 260 | - | 8 | 85 | 8 | 23 | 77 | 8 | 82/81 |
| 2005 | 240 | - | 0 | 92 | 8 | 0 | 100 | 8 | 105/115 |
| 2010 | 260 | 40 | 0 | 100 | 0 | 46 | 54 | 0 | 93/89 |
| 2015 | 260 | 20 | 8 | 92 | 0 | 0 | 100 | 0 | 89/114 |
| 2020 | 280 | - | 7 | 93 | 0 | 7 | 93 | 0 | 94/115 |
| 2025 | 300 | - | 0 | 100 | 0 | 0 | 93 | 0 | - / - |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 2520 | - | 2 | 98 | 0 | 0 | 0 | 0 | 15/30 |
| 2000 | 2480 | - | 0 | 99 | 1 | 32 | 19 | 1 | 10/25 |
| 2005 | 2460 | 20 | 0 | 94 | 6 | 16 | 77 | 7 | 16/34 |
| 2010 | 2240 | - | 1 | 98 | 1 | 51 | 6 | 9 | 11/28 |
| 2015 | 3920 | 100 | 5 | 95 | 1 | 2 | 95 | 1 | 8/29 |
| 2020 | 3360 | - | 2 | 97 | 1 | 2 | 9 | 4 | 10/27 |
| 2025 | 3040 | 20 | 0 | 92 | 8 | 7 | 7 | 26 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 1480 | - | 8 | 92 | 0 | 0 | 0 | 0 | 27/37 |
| 2000 | 1640 | - | 1 | 99 | 0 | 5 | 0 | 1 | 24/32 |
| 2005 | 1480 | - | 0 | 96 | 4 | 18 | 5 | 1 | 30/46 |
| 2010 | 1880 | 20 | 7 | 93 | 0 | 3 | 0 | 0 | 27/43 |
| 2015 | 2040 | - | 20 | 80 | 0 | 32 | 3 | 0 | 24/32 |
| 2020 | 1760 | - | 9 | 84 | 7 | 6 | 0 | 13 | 24/37 |
| 2025 | 1440 | - | 3 | 79 | 18 | 6 | 0 | 69 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | 800 | - | 20 | 80 | 0 | 0 | 0 | 0 | 32/44 |
| 2000 | 720 | 40 | 14 | 53 | 33 | 11 | 0 | 3 | 26/33 |
| 2005 | 820 | 100 | 17 | 78 | 5 | 20 | 29 | 0 | 39/51 |
| 2010 | 640 | 20 | 3 | 94 | 3 | 0 | 0 | 3 | 33/42 |
| 2015 | 680 | 60 | 21 | 79 | 0 | 0 | 0 | 0 | 18/24 |
| 2020 | 580 | - | 21 | 79 | 0 | 3 | 0 | 0 | 29/39 |
| 2025 | 460 | - | 9 | 78 | 13 | 0 | 0 | 13 | - / - |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 18/39 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/32 |
| 2015 | 40 | - | 0 | 100 | 0 | 50 | 50 | 0 | 13/30 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 15/23 |
| 2000 | 120 | - | 0 | 83 | 17 | 83 | 0 | 17 | 19/17 |
| 2005 | 80 | - | 0 | 100 | 0 | 75 | 25 | 0 | 29/33 |
| 2010 | 80 | - | 0 | 100 | 0 | 25 | 50 | 0 | 16/23 |
| 2015 | 80 | - | 0 | 75 | 25 | 0 | 100 | 25 | 10/13 |
| 2020 | 80 | - | 0 | 100 | 0 | 0 | 75 | 0 | 18/21 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 75 | 25 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 1995 | 340 | - | 18 | 77 | 6 | 0 | 0 | 6 | 11/29 |
| 2000 | 420 | - | 0 | 95 | 5 | 5 | 0 | 5 | 5/16 |
| 2005 | 440 | - | 5 | 82 | 14 | 0 | 0 | 5 | 9/24 |
| 2010 | 260 | - | 31 | 62 | 8 | 0 | 0 | 15 | 8/29 |
| 2015 | 200 | 40 | 20 | 80 | 0 | 20 | 0 | 0 | 6/24 |
| 2020 | 180 | - | 22 | 78 | 0 | 0 | 0 | 0 | 6/26 |
| 2025 | 160 | - | 25 | 75 | 0 | 0 | 0 | 13 | - / - |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/39 |
| 2020 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | 13/36 |
| 2025 | 440 | 20 | 9 | 91 | 0 | 0 | 0 | 27 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2005 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 4/7 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/7 |
| 2015 | 160 | 20 | 25 | 75 | 0 | 0 | 0 | 0 | 4/6 |
| 2020 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 2/3 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 50/112 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Quercus gambelii[P] -- (Gambel oak) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 130/41 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 91/84 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | 26/81 |
| 2005 | - | - | - | - | - | - | - | - | 35/76 |
| 2010 | - | - | - | - | - | - | - | - | 40/61 |
| 2015 | 160 | - | 50 | 50 | 0 | 0 | 63 | 13 | 53/69 |
| 2020 | - | - | - | - | - | - | - | - | 32/70 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 140 | - | 0 | 100 | 0 | 14 | 0 | 0 | 26/37 |
| 2000 | 80 | - | 0 | 100 | 0 | 25 | 0 | 0 | 28/44 |
| 2005 | 80 | - | 0 | 75 | 25 | 75 | 0 | 0 | 28/52 |
| 2010 | 100 | 20 | 0 | 100 | 0 | 20 | 20 | 0 | 22/37 |
| 2015 | 180 | - | 44 | 56 | 0 | 22 | 33 | 0 | 15/25 |
| 2020 | 100 | - | 0 | 80 | 20 | 0 | 0 | 0 | 20/38 |
| 2025 | 80 | - | 0 | 75 | 25 | 0 | 0 | 50 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

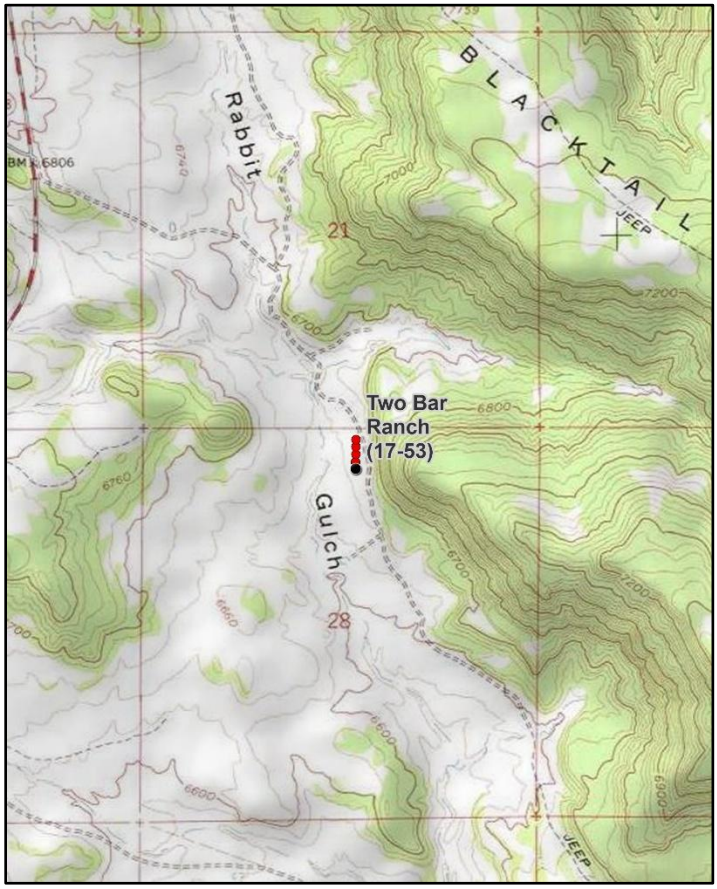
**Table 17-52.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

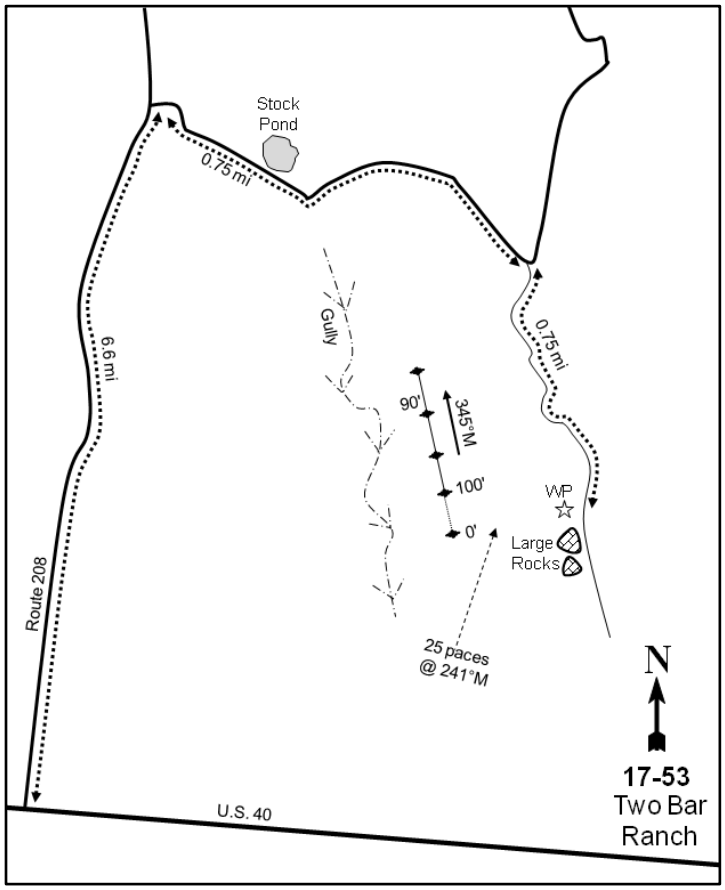
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 1 | - | - | 100 | - | - | 7.0 |
| 2020 | 16 | 40 | 40 | 20 | - | - | 4.8 |
| 2025 | 16 | - | 80 | 20 | - | - | 2.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 11 | 14 | - | 43 | 43 | - | 13.1 |
| 2020 | 11 | 14 | 14 | - | 57 | 14 | 15.0 |
| 2025 | 12 | - | 14 | 14 | 43 | 29 | 10.6 |

**Table 17-52.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 16.5 | 5.4 | 7.3 | 18.9 | 0.0 | 10.0 | 0.0 | **58.1** | Fair |
| 2000 | 14.2 | 5.7 | 8.0 | 25.4 | 0.0 | 10.0 | 0.0 | **63.3** | Fair-Good |
| 2005 | 24.3 | 4.6 | 6.7 | 21.8 | -0.1 | 10.0 | 0.0 | **67.3** | Good |
| 2010 | 25.7 | 11.9 | 11.9 | 16.2 | 0.0 | 10.0 | 0.0 | **75.7** | Good |
| 2015 | 20.0 | 10.8 | 14.3 | 30.0 | 0.0 | 10.0 | 0.0 | **85.1** | Excellent |
| 2020 | 23.4 | 10.8 | 13.5 | 30.0 | 0.0 | 10.0 | 0.0 | **87.7** | Excellent |
| 2025 | 22.3 | 9.1 | 8.3 | 30.0 | 0.0 | 10.0 | 0.0 | **79.7** | Good-Excellent |

# TWO BAR RANCH - STUDY NO. 17-53




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Tabiona SE; Township 2S, Range 7W, Section 28 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 527226 East 4459218 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 345° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (9ft & 85ft), Line 2 (26ft), Line 3 (45ft), Line 4 (60ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From U.S. 40 five miles east of Fruitland, travel north towards Tabiona on State Route 208 for 6.6 miles. Just after a small road cut there is a road on the right. Turn right towards Rabbit Gulch and go 0.8 miles to an intersection. Turn right (south) and continue another 0.8 miles down a gully-ridden road to two large rocks on the right (west) side of the road. From the highest point of the first rock, the 0-foot baseline stake is 25 paces away at 241 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 6,665ft (2,031m) |
| Aspect | West |
| Slope | 4% |
| Sample Dates | 08/03/1995, 07/14/2000, 06/23/2005, 07/07/2009, 06/29/2010, 07/09/2015, 07/27/2020, 07/28/2025 |

## Wildlife Habitat and Vegetation History

**Table 17-53.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 17-53.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Wyoming Big Sagebrush | No Encroachment |
| 1988 | Wyoming Big Sagebrush | Early Phase I |
| 1995 | Wyoming Big Sagebrush | Early Phase I |
| 2000 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Shadscale/Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2009 | Shadscale/Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2010 | Shadscale/Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2015 | Shadscale/Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Shadscale/Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Shadscale/Perennial Grass/Wyoming Big Sagebrush | Early Phase I |

## Site Notes

Grazing is managed by the DWR for spring grazing (April/May) to promote browse.

## Soils

**Table 17-53.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Clay Loam | 7.7 | 52.6 | 24.8 | 22.6 | 1.2 | 1.5 | 92.8 | 0.5 | 07/14/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 13 inches |
| NRCS Ecological Site | Upland Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R048AY306UT |
| States and Transitions | 1982-2025 - Current Potential State: Community Phase 2.1 |

From study establishment in 1982 through the 2000 sample year, this site existed as a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*)-dominated plant community. In 2005, however, cover of Wyoming big sagebrush decreased substantially while shadscale saltbush (*Atriplex confertifolia*) increased and became a co-dominant species. Wyoming big sagebrush and shadscale saltbush have been dominant vegetation components in all subsequent sample years (Photos, Pre-1992 Data, Table 17-53.12, Table 17-53.13). The herbaceous understory has also been a dominant site component since 2000 and has been mainly comprised of a diverse assortment of perennial grasses with needle and thread (*Hesperostipa comata*) as the most abundant species. The introduced annual grass cheatgrass (*Bromus tectorum*) has been observed in many sample years, but with low abundance and cover (Table 17-53.10). Forbs have remained scarce throughout the duration of the study (Table 17-53.11). Twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been scattered throughout the area, and the site has been considered to be within Early Phase I of woodland succession since 1988 (Photos, Pre-1992 Data, Table 17-53.12, Table 17-53.14).

Deer winter range condition on this site has fluctuated between poor and fair-good since 1995; the study site was considered to be in poor-fair condition in 2025. Improvement to deer winter range could be accomplished through efforts that support preferred browse reproduction and reduce decadence within the population. Diversifying and increasing the native perennial forb populations would also improve winter range conditions (Table 17-53.11, Table 17-53.13, Table 17-53.15). The sagebrush component of this site could provide valuable browse for elk and deer during the winter months (Table 17-53.3). Pellet transect data indicates that elk and deer presence has been low to moderate over the sample period (Table 17-53.9). However, the larger vicinity had scattered occurrences of collared mule deer during the 2024/25 winter season (Wildlife Migration Initiative). Over 60% of Wyoming big sagebrush plants sampled in density strips showed signs of moderate to heavy utilization in 1995-2005 and 2015. However, only 36% showed that level of utilization in 2025 (Table 17-53.13). Additional on-site observations for 2025 note light utilization (10-20%) on needle and thread, but little to no utilization forb species.

## Trend Summary Tables

**Table 17-53.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 13.8 | 2.4 | 0.2 | - | - | - |
| 2000 | 17.6 | 2.2 | 0.4 | - | - | - |
| 2005 | 10.8 | 4.3 | 0.4 | 12.0 | 5.0 | 0.5 |
| 2009 | 10.0 | 6.2 | 0.6 | 12.6 | 5.7 | 0.7 |
| 2010 | 11.9 | 4.5 | 0.6 | 12.4 | 6.5 | 0.5 |
| 2015 | 9.4 | 3.9 | 0.4 | 12.5 | 5.1 | 0.8 |
| 2020 | 15.1 | 6.0 | 0.8 | 16.9 | 6.7 | 1.3 |
| 2025 | 8.9 | 5.0 | 1.4 | 10.7 | 7.6 | 1.5 |

**Table 17-53.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | 1 | 302 | 61 | 172 | 0.0 | 7.1 | 0.3 | 1.0 |
| 2000 | - | 323 | 1 | 75 | - | 10.0 | 0.0 | 0.6 |
| 2005 | - | 245 | 169 | 155 | - | 12.0 | 3.5 | 3.1 |
| 2009 | 2 | 286 | 17 | 100 | 0.0 | 15.3 | 0.2 | 1.8 |
| 2010 | 6 | 281 | 67 | 134 | 0.0 | 17.8 | 0.3 | 2.6 |
| 2015 | 22 | 377 | 120 | 114 | 0.3 | 16.6 | 0.7 | 0.6 |
| 2020 | 69 | 331 | 48 | 46 | 0.7 | 24.1 | 0.2 | 0.3 |
| 2025 | 25 | 378 | 73 | 84 | 0.3 | 23.6 | 0.4 | 0.8 |

**Table 17-53.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 33.6 | 15.7 | 28.9 | 0.1 | 0.1 | 26.2 |
| 2000 | 45.3 | 15.0 | 27.5 | 0.1 | 0.2 | 30.0 |
| 2005 | 42.8 | 11.3 | 34.2 | 0.1 | 0.0 | 28.1 |
| 2009 | 29.1 | 5.1 | 42.0 | 0.1 | - | 37.5 |
| 2010 | 35.5 | 7.1 | 42.4 | 0.0 | - | 39.5 |
| 2015 | 34.2 | 11.3 | 32.6 | 0.1 | - | 33.7 |
| 2020 | 26.4 | 14.3 | 43.6 | 0.2 | 0.6 | 48.6 |
| 2025 | 35.2 | 6.0 | 37.7 | 0.2 | 0.0 | 37.0 |

**Table 17-53.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 28 | 17 | 2 |
| 2000 | - | 9 | 11 | 3 |
| 2005 | - | 28 | 18 | 18 |
| 2009 | - | 28 | 19 | 24 |
| 2010 | - | 12 | 20 | 18 |
| 2015 | - | 13 | 19 | 44 |
| 2020 | - | 16 | 15 | 29 |
| 2025 | 1 | 15 | 23 | 10 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | 0.7 (1.8) | 37.5 (92.7) | 34.9 (86.1) | - |
| 2005 | 0.7 (1.8) | 46.2 (114.2) | 34.2 (84.4) | - |
| 2009 | - | - | - | - |
| 2010 | - | 21.5 (53.0) | 14.1 (34.8) | - |
| 2015 | 1.5 (3.6) | 6.7 (16.6) | 32.2 (79.5) | - |
| 2020 | - | 26.8 (66.2) | 39.6 (97.7) | - |
| 2025 | - | 10.0 (24.8) | 26.2 (64.6) | - |

**Table 17-53.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus tectorum[ai] (cheatgrass) | Carex obtusata (obtuse sedge) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Poa secunda (Sandberg bluegrass) | Sporobolus cryptandrus (sand dropseed) |
|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | |
| 1995 | 71 | - | 1 | 41 | 35 | 204 | 57 | - | 2 |
| 2000 | 33 | - | - | 17 | 53 | 186 | 116 | - | - |
| 2005 | 43 | - | - | 49 | 25 | 69 | 118 | - | - |
| 2009 | 66 | 2 | 2 | - | 29 | 131 | 144 | - | - |
| 2010 | 52 | - | 6 | 37 | 28 | 107 | 138 | 3 | - |
| 2015 | 66 | - | 22 | 150 | 40 | 122 | 227 | 7 | - |
| 2020 | 70 | 10 | 69 | 90 | 17 | 60 | 216 | 12 | 3 |
| 2025 | 32 | 0 | 25 | 170 | 28 | 130 | 254 | 9 | - |
| year | Average Cover (%) | | | | | | | | |
| 1995 | 1.1 | - | 0.0 | 0.2 | 1.3 | 2.5 | 1.8 | - | 0.0 |
| 2000 | 0.9 | - | - | 0.2 | 1.1 | 3.4 | 4.4 | - | - |
| 2005 | 1.6 | - | - | 0.5 | 1.2 | 1.8 | 6.9 | - | - |
| 2009 | 2.1 | 0.0 | 0.0 | - | 0.9 | 2.7 | 9.5 | - | - |
| 2010 | 1.6 | - | 0.0 | 0.5 | 1.1 | 3.5 | 11.1 | 0.0 | - |
| 2015 | 1.2 | - | 0.3 | 1.8 | 1.5 | 1.8 | 10.3 | 0.0 | - |
| 2020 | 3.4 | 0.1 | 0.7 | 3.6 | 0.7 | 1.0 | 15.1 | 0.1 | 0.0 |
| 2025 | 1.5 | 0.0 | 0.3 | 3.2 | 0.9 | 2.1 | 15.7 | 0.2 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-53.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Arabis drummondii (Drummond's rockcress) | Arenaria (sandwort) | Astragalus convallarius (lesser rushy milkvetch) | Calochortus nuttallii (sego lily) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Eriogonum cernuum[a] (nodding buckwheat) | Lappula occidentalis[a] (flatspine stickseed) | Lepidium[a] (pepperweed) | Machaeranthera canescens (hoary tansyaster) | Phlox longifolia (longleaf phlox) | Plantago patagonica[a] (woolly plantain) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | - | 7 | - | - | - | 3 | 6 | - | - | 1 | 3 | 2 | 17 | 28 | 33 | 90 | 10 |
| 2000 | - | 3 | - | - | - | - | - | - | - | 1 | - | - | - | - | 1 | 9 | - |
| 2005 | - | 5 | - | 4 | - | 8 | 18 | 1 | - | 54 | - | 9 | 127 | 5 | 4 | 45 | 21 |
| 2009 | 1 | - | - | - | - | - | 4 | - | - | - | - | - | 10 | - | - | 8 | 5 |
| 2010 | - | - | 3 | - | 0 | - | 4 | - | 1 | 1 | - | 3 | 50 | 1 | 1 | 9 | 20 |
| 2015 | - | - | - | - | 1 | - | - | - | - | 10 | - | - | 61 | 17 | 7 | 6 | 57 |
| 2020 | - | - | - | - | - | - | - | - | - | - | - | - | 3 | 3 | 2 | 3 | 44 |
| 2025 | 13 | 2 | - | - | 4 | - | - | - | - | - | - | - | 26 | - | - | 8 | 51 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | - | 0.0 | - | - | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.2 | 0.1 |
| 2000 | - | 0.0 | - | - | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | 0.1 | - |
| 2005 | - | 0.0 | - | 0.0 | - | 0.0 | 0.1 | 0.0 | - | 0.6 | - | 0.0 | 2.7 | 0.0 | 0.1 | 0.3 | 0.1 |
| 2009 | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.2 | - | - | 0.0 | 0.0 |
| 2010 | - | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| 2015 | - | - | - | - | 0.0 | - | - | - | - | 0.0 | - | - | 0.3 | 0.1 | 0.1 | 0.0 | 0.3 |
| 2020 | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| 2025 | 0.0 | 0.0 | - | - | 0.0 | - | - | - | - | - | - | - | 0.0 | - | - | 0.1 | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Streptanthus cordatus (heartleaf twistflower) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) | Trifolium gymnocarpon (hollyleaf clover) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1995 | 10 | 70 | - | 1 | - | - |
| 2000 | 1 | 64 | - | - | - | - |
| 2005 | 3 | 113 | - | 2 | - | - |
| 2009 | 6 | 90 | - | - | - | - |
| 2010 | 4 | 122 | - | - | - | - |
| 2015 | 3 | 88 | 12 | - | - | - |
| 2020 | - | 41 | - | - | 2 | - |
| 2025 | 2 | 71 | - | - | - | 1 |
| year | Average Cover (%) | | | | | |
| 1995 | 0.0 | 0.5 | - | 0.0 | - | - |
| 2000 | 0.0 | 0.5 | - | - | - | - |
| 2005 | 0.0 | 2.7 | - | 0.0 | - | - |
| 2009 | 0.1 | 1.7 | - | - | - | - |
| 2010 | 0.0 | 2.6 | - | - | - | - |
| 2015 | 0.0 | 0.5 | 0.0 | - | - | - |
| 2020 | - | 0.3 | - | - | 0.0 | - |
| 2025 | 0.0 | 0.7 | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-53.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex confertifolia[p] (shadscale saltbush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Linanthus pungens (granite prickly phlox) | Opuntia polyacantha (plains pricklypear) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Sarcobatus vermiculatus (greasewood) | Tetradymia canescens (spineless horsebrush) | Tetradymia spinosa (shortspine horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 4.1 | 7.8 | - | - | 0.5 | 0.1 | - | 0.9 | - | - | 4.1 | - | - |
| 2009 | 3.7 | 8.8 | - | - | - | 0.1 | - | 0.8 | - | 0.7 | 4.9 | - | - |
| 2010 | 5.2 | 7.1 | - | - | - | 0.1 | - | 1 | - | 0.5 | 5.5 | - | - |
| 2015 | 5.3 | 7.2 | - | - | - | - | - | 1.6 | - | 0.8 | 3.5 | - | - |
| 2020 | 8.3 | 8.3 | - | - | - | 0.3 | - | 2.1 | - | 1.3 | 4.6 | - | - |
| 2025 | 3.2 | 7.5 | - | - | - | - | - | 2.3 | - | 1.5 | 5.3 | - | - |
| year | Quadrat Cover (%) | | | | | | | | | | | | |
| 1995 | 11.2 | 2.6 | - | - | - | - | - | 1.1 | - | 0.2 | 1.3 | - | 0.0 |
| 2000 | 13.2 | 4.5 | - | - | - | - | - | 1.0 | - | 0.4 | 1.2 | - | - |
| 2005 | 4.3 | 6.4 | 0.0 | 0.0 | 0.0 | 0.0 | - | 1.0 | 0.0 | 0.4 | 3.3 | - | - |
| 2009 | 3.5 | 6.5 | - | - | - | 0.0 | 0.0 | 1.9 | - | 0.6 | 4.4 | 0.0 | - |
| 2010 | 5.2 | 6.7 | - | - | - | 0.0 | - | 1.4 | - | 0.6 | 3.2 | 0.0 | - |
| 2015 | 4.6 | 4.8 | - | - | - | 0.0 | - | 1.9 | 0.0 | 0.4 | 2.0 | - | - |
| 2020 | 7.9 | 7.0 | - | - | - | 0.1 | - | 2.0 | 0.0 | 0.8 | 4.0 | - | - |
| 2025 | 2.9 | 5.8 | - | - | - | 0.2 | - | 3.1 | - | 1.4 | 1.9 | - | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-53.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia nova[P] -- (black sagebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 29/58 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/27 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1995 | 5080 | 340 | 26 | 59 | 15 | 48 | 35 | 7 | 52/77 |
| 2000 | 5080 | 180 | 11 | 56 | 33 | 40 | 28 | 16 | 43/63 |
| 2005 | 2280 | 20 | 3 | 35 | 62 | 25 | 52 | 56 | 43/56 |
| 2009 | - | - | - | - | - | - | - | - | 39/48 |
| 2010 | 2080 | 40 | 14 | 64 | 23 | 32 | 6 | 21 | 40/55 |
| 2015 | 1860 | 20 | 1 | 60 | 39 | 32 | 53 | 32 | 43/66 |
| 2020 | 2220 | 20 | 8 | 80 | 12 | 18 | 29 | 17 | 43/60 |
| 2025 | 1360 | 80 | 0 | 25 | 75 | 15 | 21 | 78 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1995 | 3080 | - | 20 | 79 | 1 | 7 | 3 | 1 | 29/49 |
| 2000 | 4020 | 60 | 12 | 76 | 12 | 9 | 12 | 2 | 21/39 |
| 2005 | 2640 | 680 | 9 | 81 | 10 | 2 | 0 | 9 | 37/55 |
| 2009 | - | - | - | - | - | - | - | - | 32/59 |
| 2010 | 3020 | 140 | 13 | 83 | 5 | 8 | 0 | 6 | 35/53 |
| 2015 | 2580 | 40 | 14 | 67 | 19 | 5 | 2 | 23 | 35/63 |
| 2020 | 2640 | 40 | 11 | 80 | 9 | 1 | 0 | 14 | 32/58 |
| 2025 | 2480 | - | 6 | 73 | 21 | 3 | 0 | 23 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 100 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/11 |
| 2000 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/45 |
| 2005 | 40 | 140 | 50 | 50 | 0 | 0 | 0 | 0 | 36/58 |
| 2009 | - | - | - | - | - | - | - | - | 28/43 |
| 2010 | - | - | - | - | - | - | - | - | 39/70 |
| 2015 | - | - | - | - | - | - | - | - | 29/42 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 28/35 |
| 2020 | - | - | - | - | - | - | - | - | 45/91 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Grayia spinosa[P] -- (spiny hopsage) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 28/23 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | 16/18 |
| 2000 | 40 | - | 50 | 0 | 50 | 0 | 0 | 50 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 34/37 |
| 2009 | - | - | - | - | - | - | - | - | 23/27 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 33/42 |
| 2015 | 40 | - | 0 | 50 | 50 | 50 | 0 | 0 | 19/25 |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 34/44 |
| 2025 | 40 | - | 0 | 50 | 50 | 0 | 100 | 100 | - / - |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 22/37 |
| 2020 | - | - | - | - | - | - | - | - | 20/24 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1995 | 1260 | - | 2 | 86 | 13 | 0 | 0 | 8 | 14/39 |
| 2000 | 1440 | - | 6 | 90 | 4 | 0 | 0 | 8 | 11/24 |
| 2005 | 1380 | - | 4 | 88 | 7 | 0 | 0 | 1 | 13/38 |
| 2009 | - | - | - | - | - | - | - | - | 13/37 |
| 2010 | 1400 | - | 7 | 86 | 7 | 0 | 0 | 13 | 11/32 |
| 2015 | 1840 | 20 | 1 | 92 | 7 | 0 | 0 | 9 | 16/39 |
| 2020 | 1820 | - | 2 | 97 | 1 | 0 | 0 | 1 | 13/30 |
| 2025 | 1860 | - | 0 | 75 | 25 | 0 | 0 | 51 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 1/3 |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - /5 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | - | 75 | 25 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 67 | 33 | 0 | 0 | 33 | 0 | - / - |
| 2009 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 60 | - | 100 | 0 | 0 | 33 | 0 | 100 | - / - |
| 2015 | 80 | - | 75 | 25 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| Sarcobatus vermiculatus -- (greasewood) | | | | | | | | | |
| 1995 | 700 | 20 | 54 | 46 | 0 | 0 | 0 | 0 | 156/94 |
| 2000 | 500 | - | 8 | 92 | 0 | 0 | 0 | 0 | 63/84 |
| 2005 | 560 | - | 29 | 61 | 11 | 0 | 0 | 0 | 71/110 |
| 2009 | - | - | - | - | - | - | - | - | 73/103 |
| 2010 | 580 | - | 14 | 86 | 0 | 0 | 0 | 0 | 73/106 |
| 2015 | 500 | - | 8 | 88 | 4 | 0 | 0 | 16 | 72/107 |
| 2020 | 540 | - | 0 | 100 | 0 | 0 | 0 | 0 | 70/105 |
| 2025 | 680 | - | 24 | 71 | 6 | 0 | 0 | 6 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/27 |
| 2009 | - | - | - | - | - | - | - | - | 44/35 |
| 2010 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 34/50 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

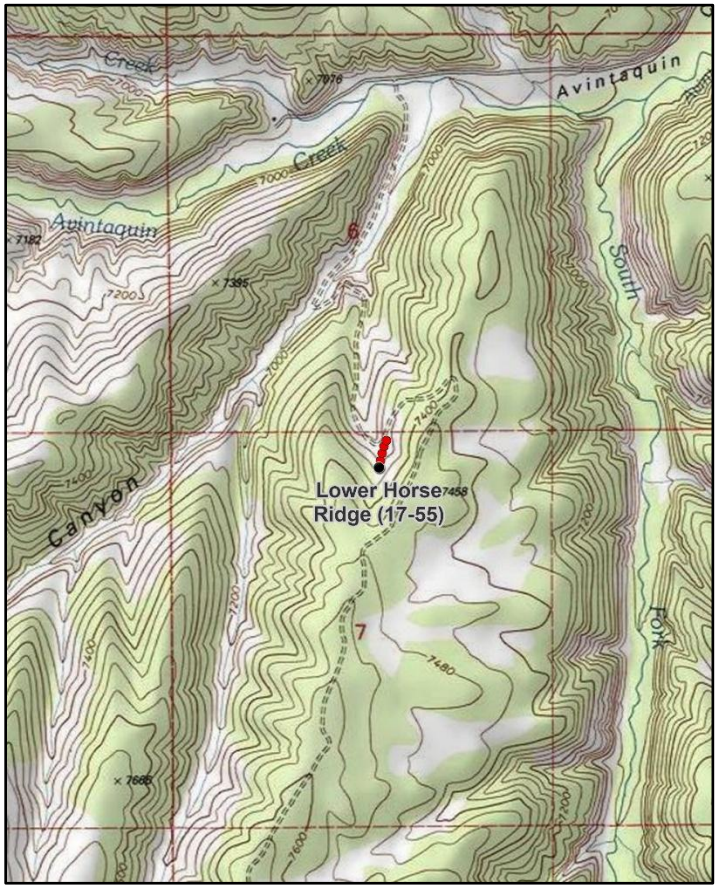
**Table 17-53.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

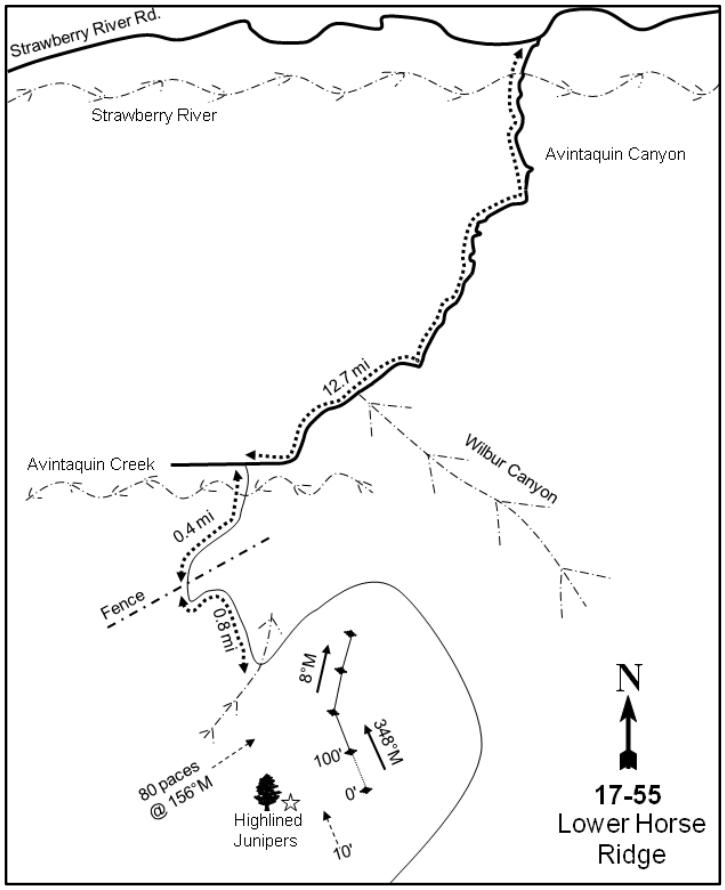
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2009 | 7 | - | 100 | - | - | - | 3.8 |
| 2015 | 21 | 15 | 62 | 23 | - | - | 3.5 |
| 2020 | 20 | 10 | 80 | 10 | - | - | 5.0 |
| 2025 | 27 | - | 87 | 13 | - | - | 5.1 |

**Table 17-53.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 16.5 | 11.2 | 12.2 | 14.1 | 0.0 | 2.0 | 0.0 | **56.0** | Fair |
| 2000 | 20.9 | 6.7 | 5.7 | 19.9 | 0.0 | 1.3 | 0.0 | **54.5** | Fair |
| 2005 | 13.1 | 6.6 | 3.4 | 23.9 | 0.0 | 6.2 | 0.0 | **53.2** | Fair |
| 2009 | 13.6 | 0.0 | 0.0 | 30.0 | 0.0 | 3.6 | 0.0 | **47.2** | Poor |
| 2010 | 13.7 | 11.3 | 6.4 | 30.0 | 0.0 | 5.3 | 0.0 | **66.7** | Fair-Good |
| 2015 | 13.8 | 6.8 | 4.3 | 30.0 | -0.2 | 1.3 | 0.0 | **56.0** | Fair |
| 2020 | 19.1 | 11.9 | 4.6 | 30.0 | -0.5 | 0.7 | 0.0 | **65.8** | Fair-Good |
| 2025 | 11.5 | 3.9 | 2.0 | 30.0 | -0.2 | 1.5 | 0.0 | **48.7** | Poor-Fair |

# LOWER HORSE RIDGE - STUDY NO. 17-55




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Gray Head Peak NW; Township 6S, Range 8W, Section 07 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 514889 East 4425527 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 7087 |
| Transect Bearing | 350° magnetic (Lines 3-4: 8° magnetic) |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From Strawberry River Road, proceed south up Avintaquin Canyon for 12.7 miles. Turn left onto a road hidden in the trees and cross Avintaquin Creek. Drive up Horse Ridge Canyon 0.4 miles to a fence. Continue up the ridge 0.8 miles to a sharp left bend in the road. From the bend and the gully bottom, walk 80 paces at a bearing of 156 degrees magnetic towards a couple of high-lined juniper trees. The 0-foot baseline stake is 10 feet away from one of the high-lined junipers.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 7,360ft (2,243m) |
| Aspect | Northwest |
| Slope | 18% |
| Sample Dates | 07/19/1995, 06/29/2000, 06/28/2005, 06/30/2010, 06/16/2015, 07/29/2020, 07/30/2025 |

**Table 17-55.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Mechanical - Bullhog | Horse Ridge Bullhog | 3293 | June 2016 | 759 |
| Hand Crew - Lop and Scatter | Anthro/Avintaquin Lop and Scatter | 6694 | September-October 2023 | 759 |

## Wildlife Habitat and Vegetation History

**Table 17-55.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | year-long |
| Shiras Moose | substantial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 17-55.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1982 | Alderleaf Mountain Mahogany | Early Phase I |
| 1988 | Alderleaf Mountain Mahogany/Perennial Grass | Early Phase I |
| 1995 | Alderleaf Mountain Mahogany/Perennial Grass | Phase I |
| 2000 | Alderleaf Mountain Mahogany/Perennial Grass | Phase I |
| 2005 | Alderleaf Mountain Mahogany/Perennial Grass | Phase I |
| 2010 | Alderleaf Mountain Mahogany/Perennial Grass | Phase I |
| 2015 | Alderleaf Mountain Mahogany/Perennial Grass | Phase I transitioning to Phase II |
| 2020 | Alderleaf Mountain Mahogany/Perennial Grass | Early Phase I |
| 2025 | Alderleaf Mountain Mahogany/Perennial Grass | Early Phase I |

## Site Notes

This site and the surrounding area have not been grazed by livestock for several decades.

## Soils

**Table 17-55.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Loam | 7.3 | 27.3 | 46.2 | 26.6 | 4.9 | 2.8 | 336.0 | 1.8 | 06/29/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | R047XA460UT |
| States and Transitions | 1982-2025 - Current Potential State: Community Phase Undefined |

This site has existed as an alderleaf mountain mahogany (*Cercocarpus montanus*)-dominated plant community since study establishment in 1982; a variety of other browse species have also been present that have provided additional cover (Photos, Pre-1992 Data, Table 17-55.12). The herbaceous understory has remained abundant throughout the duration of the study (Table 17-55.7). Perennial grasses have been a dominant vegetation component since 1988 with bluebunch wheatgrass (*Pseudoroegneria spicata*) as the most abundant species (Pre-1992 Data, Table 17-55.10). Forbs have remained diverse and moderately abundant, with the native perennial species bastard toadflax (*Comandra umbellata*) providing the most cover of any single species in many sample years (Table 17-55.11). Twoneedle pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and Rocky Mountain juniper (*J. scopulorum*) increased in cover and density through the 2015 sample year. Covers and densities for these tree species were found to be reduced in 2020 and 2025, however, due to a 2016 bullhog treatment and a lop and scatter project in 2023 (Table 17-55.1, Table 17-55.12, Table 17-55.14).

Deer winter range condition on this site has fluctuated between good and excellent since 1995; the study site was considered to be in excellent condition in 2025. The sagebrush component of this site could provide valuable browse for elk and deer during the winter months (Table 17-55.3). Although this site is located in currently-mapped mule deer winter range, it is also in the proximity of year-long range. As such, the alderleaf mountain mahogany population could also be valuable to wildlife during transitional periods. Pellet transect data indicates that elk and deer presence has been low to moderate over the course of the study (Table 17-55.9). Utilization of alderleaf mountain mahogany has ranged from moderate to heavy since 1995. More specifically, 58% of alderleaf mountain mahogany plants sampled in density strips showed signs of moderate to heavy hedging in 2025, although that percentage has been both higher and lower in previous sample years. Mountain big sagebrush utilization has largely remained moderate over the same period, with 46% of plants being moderately to heavily browsed during the most recent sample year (2025) (Table 17-55.13). However, on-site observations for 2025 note little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 17-55.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1995 | 7.0 | 3.8 | 2.4 | - | - | - |
| 2000 | 12.3 | 2.5 | 4.5 | - | - | - |
| 2005 | 13.0 | 2.6 | 4.7 | 15.5 | 3.0 | 6.1 |
| 2010 | 14.0 | 2.8 | 6.6 | 20.3 | 2.3 | 6.5 |
| 2015 | 18.4 | 3.7 | 8.2 | 23.2 | 5.0 | 12.2 |
| 2020 | 15.9 | 5.0 | 0.2 | 21.7 | 6.8 | 0.7 |
| 2025 | 16.4 | 5.8 | 0.1 | 25.1 | 5.9 | - |

**Table 17-55.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1995 | - | 348 | 17 | 251 | - | 14.4 | 0.1 | 4.7 |
| 2000 | - | 308 | - | 213 | - | 15.8 | - | 3.1 |
| 2005 | - | 276 | 21 | 202 | - | 11.3 | 0.2 | 5.2 |
| 2010 | - | 293 | 1 | 184 | - | 17.0 | 0.0 | 3.6 |
| 2015 | - | 314 | 26 | 193 | - | 20.8 | 0.1 | 5.1 |
| 2020 | - | 312 | 10 | 174 | - | 25.2 | 0.1 | 4.5 |
| 2025 | - | 328 | 6 | 213 | - | 24.8 | 0.0 | 6.8 |

**Table 17-55.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1995 | 18.1 | 0.4 | 32.2 | 4.9 | 11.6 | 34.2 |
| 2000 | 16.0 | 0.0 | 36.5 | 18.2 | 6.5 | 36.7 |
| 2005 | 25.4 | 0.2 | 29.6 | 16.1 | 6.9 | 33.6 |
| 2010 | 20.2 | 0.1 | 40.5 | 16.2 | 5.8 | 43.5 |
| 2015 | 29.3 | 0.2 | 32.9 | 16.3 | 8.5 | 47.4 |
| 2020 | 12.3 | 0.1 | 43.8 | 8.2 | 10.3 | 46.0 |
| 2025 | 14.0 | 0.2 | 46.2 | 9.3 | 7.4 | 45.7 |

**Table 17-55.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1995 | - | 26 | 2 | 6 |
| 2000 | - | 11 | 1 | 5 |
| 2005 | 1 | 31 | 6 | 33 |
| 2010 | - | 10 | 8 | 4 |
| 2015 | - | 1 | 2 | 3 |
| 2020 | - | 12 | 5 | - |
| 2025 | - | 19 | 3 | 1 |
| Year | Days Use Per Acre (ha) | | | |
| 1995 | - | - | - | - |
| 2000 | - | 24.1 (59.6) | 2.0 (5.0) | - |
| 2005 | - | 33.5 (82.8) | 10.7 (26.5) | - |
| 2010 | - | 14.1 (34.8) | 24.8 (61.2) | - |
| 2015 | - | 16.1 (39.7) | 10.7 (26.5) | - |
| 2020 | - | 28.1 (69.5) | 14.1 (34.8) | - |
| 2025 | - | 33.5 (82.8) | 1.3 (3.3) | - |

**Table 17-55.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Carex rossii (Ross' sedge) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | |
| 1995 | 50 | 39 | 164 | 3 | 2 | 259 |
| 2000 | 18 | 43 | 94 | 3 | - | 218 |
| 2005 | 50 | 54 | 70 | - | - | 191 |
| 2010 | 16 | 41 | 61 | 7 | 2 | 222 |
| 2015 | 15 | 69 | 39 | 9 | 8 | 246 |
| 2020 | 31 | 45 | 54 | 4 | 2 | 245 |
| 2025 | 20 | 15 | 72 | 1 | - | 265 |
| year | Average Cover (%) | | | | | |
| 1995 | 0.6 | 1.2 | 5.4 | 0.0 | 0.0 | 7.1 |
| 2000 | 0.3 | 1.4 | 2.5 | 0.1 | - | 11.4 |
| 2005 | 1.2 | 1.5 | 2.0 | - | - | 6.6 |
| 2010 | 0.1 | 1.3 | 1.7 | 0.2 | 0.0 | 13.7 |
| 2015 | 1.3 | 1.9 | 1.8 | 0.4 | 0.2 | 15.3 |
| 2020 | 1.4 | 1.7 | 3.1 | 0.2 | 0.0 | 18.8 |
| 2025 | 1.1 | 0.8 | 4.7 | 0.0 | - | 18.2 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-55.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Arabis (rockcress) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus purshii (woollypod milkvetch) | Castilleja angustifolia (northwestern Indian paintbrush) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Cymopterus (springparsley) | Cynoglossum officinale[ani] (gypsyflower) | Descurainia pinnata[a] (western tansymustard) | Erigeron (fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Hymenopappus filifolius (fineleaf hymenopappus) | Ipomopsis aggregata (scarlet gilia) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 2 | 6 | 16 | 3 | 35 | 5 | 146 | - | 26 | - | - | 10 | 1 | 1 | - | - | - |
| 2000 | - | 2 | 0 | - | 47 | - | 128 | 1 | 5 | - | - | - | 4 | 15 | - | - | - |
| 2005 | 17 | 5 | 2 | 2 | 11 | 1 | 144 | 10 | 33 | - | 2 | 1 | - | 20 | - | - | 1 |
| 2010 | - | - | - | 3 | 4 | 1 | 123 | 2 | 21 | - | - | - | 13 | 18 | 2 | 15 | - |
| 2015 | 10 | 10 | 8 | - | 8 | - | 116 | 8 | 24 | 2 | - | 16 | - | 21 | 1 | 19 | - |
| 2020 | 7 | - | 4 | - | 3 | - | 129 | 1 | 6 | - | 3 | - | - | 18 | 1 | 10 | - |
| 2025 | 6 | - | 9 | - | 4 | - | 169 | 1 | 6 | - | - | - | 3 | 10 | 3 | 11 | 4 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.0 | 0.1 | 0.2 | 0.0 | 0.5 | 0.0 | 1.5 | - | 0.1 | - | - | 0.1 | 0.0 | 0.0 | - | - | - |
| 2000 | - | 0.0 | 0.0 | - | 0.4 | - | 1.0 | 0.0 | 0.1 | - | - | - | 0.0 | 0.1 | - | - | - |
| 2005 | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 2.5 | 0.0 | 0.2 | - | 0.0 | 0.0 | - | 0.6 | - | - | 0.0 |
| 2010 | - | - | - | 0.0 | 0.1 | 0.0 | 1.9 | 0.1 | 0.2 | - | - | - | 0.0 | 0.3 | 0.0 | 0.2 | - |
| 2015 | 0.1 | 0.0 | 0.1 | - | 0.3 | - | 2.3 | 0.1 | 0.3 | 0.0 | - | 0.1 | - | 0.3 | 0.0 | 0.4 | - |
| 2020 | 0.0 | - | 0.0 | - | 0.0 | - | 2.7 | 0.0 | 0.0 | - | 0.0 | - | - | 0.2 | 0.0 | 0.5 | - |
| 2025 | 0.0 | - | 0.5 | - | 0.0 | - | 4.3 | 0.0 | 0.0 | - | - | - | 0.1 | 0.0 | 0.0 | 0.2 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Linum lewisii (Lewis flax) | Lithospermum incisum (narrowleaf stoneseed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Mertensia (bluebells) | Packera multilobata (lobeleaf groundsel) | Pedicularis centranthera (dwarf lousewort) | Penstemon caespitosus (mat penstemon) | Penstemon humilis (low beardtongue) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Potentilla gracilis (slender cinquefoil) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Stenotus acaulis (stemless mock goldenweed) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1995 | 25 | 19 | 6 | 53 | - | 7 | - | 4 | 19 | 46 | 6 | - | 2 | - | 17 | 27 | 5 |
| 2000 | 4 | 7 | - | 18 | - | 5 | - | 5 | 2 | 7 | 4 | - | 1 | - | 33 | 13 | - |
| 2005 | 14 | - | 1 | 19 | - | 4 | 0 | 7 | 9 | 24 | 5 | 4 | 6 | 1 | 39 | 14 | - |
| 2010 | 22 | - | - | 15 | - | 1 | - | - | - | 13 | - | - | 7 | - | 2 | 16 | 3 |
| 2015 | 31 | 7 | 6 | 12 | - | 9 | 2 | - | 6 | 16 | 7 | - | 5 | - | 4 | 11 | 1 |
| 2020 | 7 | 3 | 6 | 20 | - | 5 | 3 | - | - | 15 | - | 1 | - | - | - | - | - |
| 2025 | 37 | 2 | 11 | 1 | 1 | 1 | - | 7 | 2 | 19 | 10 | - | 7 | - | - | 16 | 1 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1995 | 0.1 | 0.3 | 0.1 | 0.7 | - | 0.0 | - | 0.0 | 0.1 | 0.3 | 0.0 | - | 0.0 | - | 0.3 | 0.3 | 0.0 |
| 2000 | 0.0 | 0.2 | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.0 | - | 0.9 | 0.1 | - |
| 2005 | 0.2 | - | 0.0 | 0.3 | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.7 | 0.1 | - |
| 2010 | 0.2 | - | - | 0.2 | - | 0.0 | - | - | - | 0.1 | - | - | 0.2 | - | 0.0 | 0.1 | 0.0 |
| 2015 | 0.5 | 0.1 | 0.0 | 0.2 | - | 0.1 | 0.0 | - | 0.1 | 0.1 | 0.1 | - | 0.0 | - | 0.2 | 0.0 | 0.0 |
| 2020 | 0.1 | 0.0 | 0.1 | 0.3 | - | 0.0 | 0.0 | - | - | 0.4 | - | 0.0 | - | - | - | - | - |
| 2025 | 0.4 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.4 | 0.2 | - | 0.0 | - | - | 0.2 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-55.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. lanceolatus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Eriogonum corymbosum (crispleaf buckwheat) | Eriogonum microthecum[p] (slender buckwheat) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Juniperus scopulorum[t] (Rocky Mountain juniper) | Pinus edulis[t] (twoneedle pinyon) | Ribes[p] (currant) | Rosa woodsii[p] (Woods' rose) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.5 | 1.9 | 12.1 | 0.1 | 1.2 | - | 1.1 | - | 0.3 | 0.8 | 2.1 | 3.2 | - | - | 0.9 | 0.4 |
| 2010 | 0.3 | 2.9 | 15.3 | - | 0.6 | - | 1.2 | - | 0.1 | 0.8 | 1.8 | 3.9 | 0.3 | - | 1.5 | 0.4 |
| 2015 | 0.9 | 3.1 | 17.9 | 0.1 | 3.1 | - | 0.9 | - | 0.6 | 2 | 1.6 | 8.6 | 0.2 | 0.1 | 0.9 | 0.4 |
| 2020 | 1.8 | 2.8 | 16.5 | 0.2 | 2.3 | - | 1.9 | - | 2.3 | 0.3 | - | 0.4 | - | 0.1 | 0.3 | 0.3 |
| 2025 | 2.1 | 3.8 | 18.1 | 0.1 | 3 | - | 1 | - | 1.5 | - | - | - | - | 0.6 | 0.4 | 0.4 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | | | |
| 1995 | - | 1.1 | 5.5 | 0.4 | 0.8 | - | 1.8 | - | 1.1 | 0.3 | - | 2.1 | - | - | 0.0 | 0.1 |
| 2000 | 0.5 | 2.3 | 8.4 | 0.5 | 1.6 | - | 0.5 | - | 0.1 | 0.3 | 1.9 | 2.3 | - | 0.1 | 0.4 | 0.2 |
| 2005 | 0.4 | 2.3 | 9.7 | 0.1 | 0.8 | 0.0 | 0.8 | - | 0.8 | 0.7 | 1.7 | 2.4 | - | 0.0 | 0.6 | 0.2 |
| 2010 | 0.6 | 2.2 | 10.4 | 0.1 | 1.1 | - | 1.5 | - | 0.3 | 0.8 | 2.7 | 3.2 | 0.0 | 0.5 | 0.2 | 0.0 |
| 2015 | 0.6 | 3.7 | 13.3 | 0.3 | 1.8 | - | 1.4 | - | 0.3 | 1.2 | 0.3 | 6.7 | 0.0 | 0.2 | 0.2 | 0.2 |
| 2020 | 1.4 | 2.2 | 10.8 | 0.6 | 1.3 | 0.0 | 0.8 | - | 2.8 | 0.0 | - | 0.2 | - | 0.2 | 0.7 | 0.0 |
| 2025 | 1.4 | 4.7 | 9.4 | 0.2 | 2.5 | - | 1.5 | 0.0 | 1.8 | - | 0.1 | - | - | 0.2 | 0.6 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-55.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 480 | - | 42 | 58 | 0 | 50 | 42 | 100 | 45/67 |
| 2005 | 420 | - | 57 | 43 | 0 | 19 | 14 | 0 | 51/62 |
| 2010 | 220 | - | 18 | 82 | 0 | 0 | 0 | 0 | 58/66 |
| 2015 | 360 | 80 | 44 | 44 | 11 | 39 | 0 | 17 | 58/68 |
| 2020 | 220 | - | 9 | 91 | 0 | 9 | 46 | 46 | 57/69 |
| 2025 | 280 | - | 36 | 64 | 0 | 50 | 29 | 0 | - / - |
| Artemisia frigida[P] -- (prairie sagewort) | | | | | | | | | |
| 1995 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1995 | 1040 | 20 | 46 | 46 | 8 | 14 | 6 | 6 | 33/46 |
| 2000 | 1120 | 20 | 20 | 55 | 25 | 21 | 5 | 16 | 46/62 |
| 2005 | 980 | 20 | 8 | 47 | 45 | 49 | 14 | 35 | 44/55 |
| 2010 | 1040 | 40 | 10 | 77 | 14 | 27 | 0 | 14 | 43/55 |
| 2015 | 800 | 20 | 18 | 65 | 18 | 28 | 25 | 18 | 53/67 |
| 2020 | 580 | - | 7 | 62 | 31 | 38 | 17 | 31 | 58/78 |
| 2025 | 560 | - | 7 | 61 | 32 | 7 | 39 | 36 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1995 | 1360 | 120 | 16 | 84 | 0 | 28 | 65 | 0 | 71/82 |
| 2000 | 1640 | 20 | 17 | 82 | 1 | 27 | 35 | 1 | 109/95 |
| 2005 | 1600 | 2400 | 21 | 66 | 13 | 10 | 84 | 5 | 108/101 |
| 2010 | 1640 | 540 | 16 | 79 | 5 | 44 | 24 | 9 | 109/96 |
| 2015 | 2020 | 1180 | 46 | 53 | 2 | 49 | 14 | 2 | 104/96 |
| 2020 | 1880 | 80 | 35 | 61 | 4 | 23 | 7 | 5 | 106/100 |
| 2025 | 2020 | 200 | 25 | 74 | 1 | 32 | 26 | 2 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1995 | 900 | 20 | 9 | 87 | 4 | 0 | 0 | 4 | 14/21 |
| 2000 | 440 | - | 0 | 96 | 5 | 5 | 5 | 0 | 8/17 |
| 2005 | 660 | - | 0 | 88 | 12 | 24 | 30 | 9 | 10/20 |
| 2010 | 340 | 20 | 12 | 82 | 6 | 18 | 0 | 0 | 14/17 |
| 2015 | 300 | - | 20 | 73 | 7 | 40 | 33 | 7 | 11/14 |
| 2020 | 540 | - | 4 | 96 | 0 | 44 | 48 | 30 | 17/22 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. lanceolatus -- (yellow rabbitbrush) | | | | | | | | | |
| 1995 | 2520 | - | 4 | 96 | 0 | 0 | 0 | 0 | 30/34 |
| 2000 | 2160 | 20 | 7 | 84 | 9 | 0 | 0 | 0 | 25/28 |
| 2005 | 2300 | - | 10 | 84 | 6 | 3 | 0 | 4 | 24/28 |
| 2010 | 1660 | - | 4 | 94 | 2 | 4 | 0 | 4 | 26/31 |
| 2015 | 1500 | 40 | 23 | 77 | 0 | 1 | 1 | 0 | 25/31 |
| 2020 | 1540 | - | 10 | 90 | 0 | 16 | 1 | 17 | 35/43 |
| 2025 | 1780 | - | 7 | 93 | 0 | 0 | 2 | 24 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 1995 | 1140 | - | 26 | 72 | 2 | 12 | 0 | 0 | 30/40 |
| 2000 | 460 | - | 4 | 74 | 22 | 22 | 22 | 4 | 35/43 |
| 2005 | 740 | 160 | 5 | 76 | 19 | 5 | 3 | 11 | 27/37 |
| 2010 | 820 | - | 20 | 78 | 2 | 2 | 0 | 2 | 35/42 |
| 2015 | 700 | - | 17 | 80 | 3 | 69 | 20 | 3 | 31/33 |
| 2020 | 760 | 20 | 3 | 95 | 3 | 3 | 0 | 3 | 41/50 |
| 2025 | 540 | - | 4 | 78 | 19 | 15 | 0 | 22 | - / - |
| Eriogonum microthecum[p] -- (slender buckwheat) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 18/24 |
| 2025 | 80 | - | 25 | 75 | 0 | 0 | 25 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 1995 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 60/53 |
| 2000 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | 17/25 |
| 2005 | 140 | - | 57 | 43 | 0 | 57 | 0 | 0 | 15/27 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 11/39 |
| 2020 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 30/27 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1995 | 3600 | 20 | 10 | 90 | 0 | 0 | 0 | 0 | 21/22 |
| 2000 | 940 | - | 23 | 77 | 0 | 0 | 0 | 0 | 10/10 |
| 2005 | 3960 | 60 | 12 | 86 | 2 | 2 | 0 | 1 | 14/15 |
| 2010 | 980 | 40 | 12 | 84 | 4 | 0 | 0 | 4 | 14/13 |
| 2015 | 780 | 260 | 26 | 74 | 0 | 10 | 0 | 0 | 15/15 |
| 2020 | 4480 | - | 2 | 98 | 0 | 0 | 0 | 1 | 19/22 |
| 2025 | 7000 | 1140 | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 60 | 20 | 67 | 33 | 0 | 0 | 33 | 33 | - / - |
| 2015 | 60 | 20 | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | - | 100 | 0 | 0 | 0 | 0 | 50 | - / - |
| 2025 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| Juniperus scopulorum[t] -- (Rocky Mountain juniper) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 120 | - | 67 | 33 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 100 | 20 | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 20 | 20 | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Ribes[p] -- (currant) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 61/62 |
| 2010 | - | - | - | - | - | - | - | - | 94/148 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 1995 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 180 | - | 11 | 89 | 0 | 0 | 0 | 0 | 48/73 |
| 2005 | 100 | - | 0 | 60 | 40 | 0 | 0 | 20 | 48/33 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 88/35 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/18 |
| 2025 | 140 | - | 14 | 86 | 0 | 0 | 0 | 0 | - / - |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1995 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 29/41 |
| 2000 | 320 | - | 0 | 100 | 0 | 0 | 0 | 6 | 46/44 |
| 2005 | 400 | - | 40 | 55 | 5 | 0 | 0 | 5 | 36/95 |
| 2010 | 380 | 40 | 21 | 79 | 0 | 16 | 0 | 0 | 35/57 |
| 2015 | 220 | - | 18 | 82 | 0 | 36 | 0 | 0 | 40/42 |
| 2020 | 360 | - | 22 | 78 | 0 | 0 | 0 | 0 | 33/51 |
| 2025 | 460 | - | 13 | 87 | 0 | 0 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1995 | 200 | - | 20 | 80 | 0 | 10 | 0 | 0 | 25/29 |
| 2000 | 300 | - | 27 | 47 | 27 | 0 | 13 | 7 | 25/23 |
| 2005 | 280 | - | 14 | 57 | 29 | 7 | 21 | 14 | 25/32 |
| 2010 | 340 | - | 12 | 88 | 0 | 0 | 0 | 12 | 23/32 |
| 2015 | 200 | - | 20 | 60 | 20 | 0 | 10 | 20 | 26/32 |
| 2020 | 220 | - | 9 | 91 | 0 | 18 | 27 | 18 | 30/35 |
| 2025 | 140 | - | 0 | 86 | 14 | 29 | 0 | 14 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

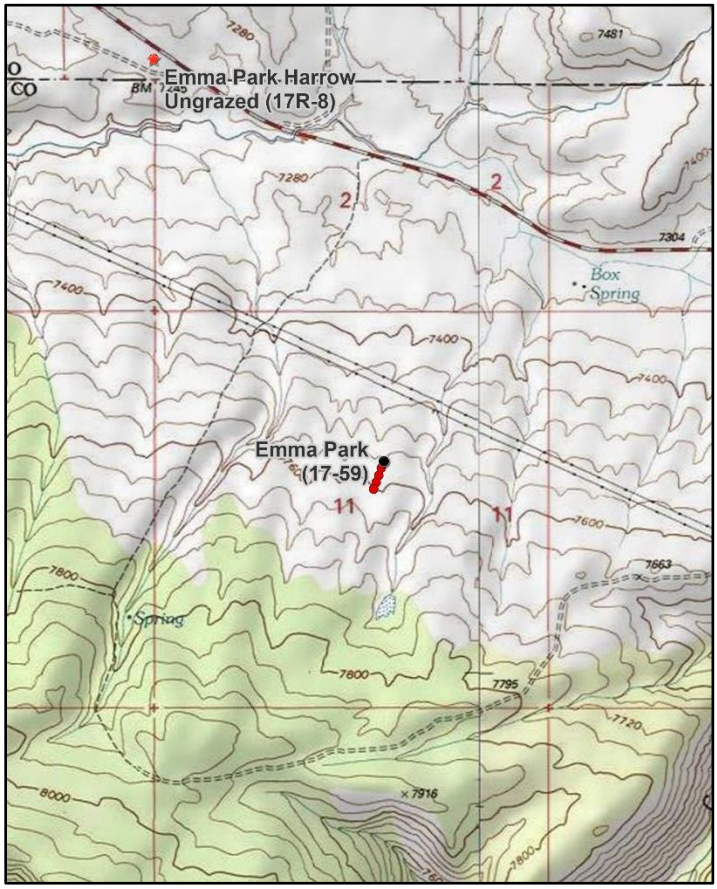
**Table 17-55.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

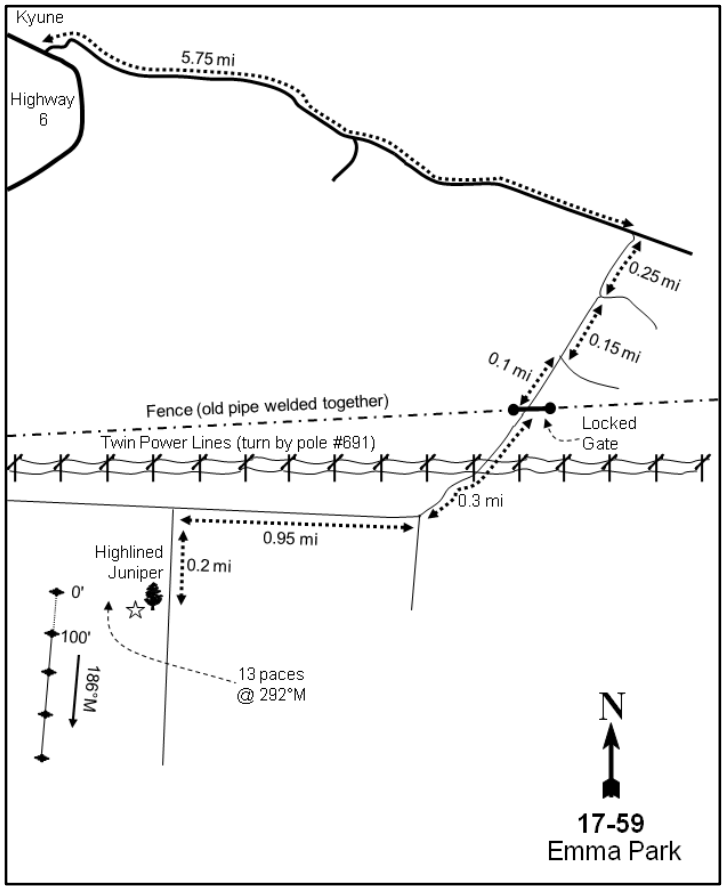
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 1995 | 28 | - | - | - | - | - | 10.0 |
| 2000 | 54 | - | - | - | - | - | 12.7 |
| 2005 | 104 | - | 12 | 59 | 24 | 6 | 15.2 |
| 2010 | 57 | - | 18 | 59 | 12 | 12 | 7.5 |
| 2015 | 66 | - | 6 | 44 | 22 | 28 | 12.9 |
| 2020 | 10 | 17 | 67 | 17 | - | - | 5.2 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 1995 | 48 | - | - | - | - | - | 9.8 |
| 2000 | 11 | - | - | - | - | - | 15.7 |
| 2015 | 15 | - | 11 | 44 | 33 | 11 | 10.9 |
| 2020 | 14 | - | 100 | - | - | - | 7.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 1995 | 26 | - | - | - | - | - | 7.4 |
| 2000 | 34 | - | - | - | - | - | 10.8 |
| 2005 | 36 | - | 21 | 50 | 7 | 21 | 11.6 |
| 2010 | 36 | 8 | 15 | 46 | - | 31 | 8.0 |
| 2015 | 43 | 13 | 13 | 31 | 31 | 13 | 8.3 |
| 2020 | 14 | 13 | 63 | 25 | - | - | 3.6 |

**Table 17-55.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1995 | 10.1 | 14.5 | 10.1 | 28.7 | 0.0 | 9.4 | 0.0 | **72.8** | Good |
| 2000 | 17.4 | 13.3 | 8.5 | 30.0 | 0.0 | 6.3 | 0.0 | **75.5** | Good |
| 2005 | 22.3 | 10.4 | 10.9 | 22.6 | 0.0 | 10.0 | -2.0 | **74.2** | Good |
| 2010 | 28.9 | 13.1 | 7.6 | 30.0 | 0.0 | 7.1 | 0.0 | **86.7** | Good |
| 2015 | 30.0 | 13.6 | 15.0 | 30.0 | 0.0 | 10.0 | 0.0 | **98.6** | Excellent |
| 2020 | 30.0 | 12.7 | 14.3 | 30.0 | 0.0 | 9.0 | -2.0 | **94.0** | Excellent |
| 2025 | 30.0 | 13.4 | 11.2 | 30.0 | 0.0 | 10.0 | 0.0 | **94.6** | Excellent |

# EMMA PARK - STUDY NO. 17-59




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Kyune SE; Township 12S, Range 9E, Section 11 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 510257 East 4405484 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 30 |
| Transect Bearing | 188° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Traveling south on U.S. 6, turn left onto the road that leads to Kyune and continue for 5.75 miles. Turn right and go 0.25 miles. Veer right and continue 0.15 miles to a fork. Stay right and proceed for 0.1 miles to a locked gate. Go through the gate and drive for 0.3 miles. Proceed to the right and go 0.95 miles following the power lines. Turn left and continue 0.2 miles to a high-lined juniper. The 0-foot stake is 13 paces away from the juniper at 292 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | KYUNE II |
| Elevation | 7,470ft (2,277m) |
| Aspect | North |
| Slope | 8% |
| Sample Dates | 09/12/1994, 09/08/2000, 08/23/2005, 08/25/2010, 08/03/2015, 08/10/2020, 07/21/2025 |

## Wildlife Habitat and Vegetation History

**Table 17-59.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | crucial | winter |

**Table 17-59.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1994 | Mountain Big Sagebrush | No Encroachment |
| 2000 | Mountain Big Sagebrush/Perennial Forb | Early Phase I |
| 2005 | Mountain Big Sagebrush/Perennial Forb | Early Phase I |
| 2010 | Mountain Big Sagebrush/Perennial Grass-Forb | Early Phase I |
| 2015 | Mountain Big Sagebrush/Perennial Grass-Forb | Early Phase I |
| 2020 | Mountain Big Sagebrush/Perennial Grass-Forb | Early Phase I |
| 2025 | Mountain Big Sagebrush/Perennial Grass-Forb | Early Phase I |

## Site Notes

In 2015, it was noted that galls were common among mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) plants.

## Soils

**Table 17-59.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.0 | 29.6 | 31.1 | 39.3 | 4.0 | 10.6 | 137.6 | 0.8 | 09/08/2000 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 17 inches |
| NRCS Ecological Site | Mountain Stony Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XA461UT |
| States and Transitions | 1994-2025 - Mountain Big Sagebrush/Introduced Non-Natives State: Community Phase 2.3 |

Since study establishment in 1994, this site has been dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a diverse herbaceous community of grasses and forbs (Table 17-59.10, Table 17-59.11, Table 17-59.12). The herbaceous understory has included the introduced annual grass species cheatgrass (*Bromus tectorum*) in most sample years, but it has been observed in low abundance since 1994 (Table 17-59.10). The vegetation on this site will likely continue to remain in this community type without a major disturbance such as fire. However, heavy grazing impacts could lead to losses in both abundance and diversity of the native forb and grass communities.

This site may serve as adequate summer range for deer due to the abundance and diversity of the shrub and herbaceous understories (Table 17-59.10, Table 17-59.11, Table 17-59.12). According to pellet group transect data, deer and elk presence has remained relatively low since 2000 (Table 17-59.9), but the herbaceous understory could provide forage during the summer months (Table 17-59.3). Cattle presence has fluctuated, but it was at its highest in 2025 (Table 17-59.9). On-site observations for the most recent sample year (2025) noted moderate utilization (20-40%) of grass species and light utilization (10-20%) of forbs.

## Trend Summary Tables

**Table 17-59.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1994 | 24.8 | 4.4 | - | - | - | - |
| 2000 | 22.5 | 5.7 | - | - | - | - |
| 2005 | 15.9 | 4.4 | - | 24.3 | 5.7 | - |
| 2010 | 17.5 | 5.1 | - | 26.2 | 5.3 | - |
| 2015 | 20.5 | 5.3 | 0.1 | 29.7 | 5.2 | - |
| 2020 | 19.9 | 6.8 | - | 31.5 | 6.5 | - |
| 2025 | 21.7 | 5.3 | - | 30.9 | 6.3 | - |

**Table 17-59.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1994 | 3 | 318 | 62 | 278 | 0.0 | 7.3 | 0.3 | 7.6 |
| 2000 | 9 | 348 | 16 | 328 | 0.1 | 9.6 | 0.1 | 11.2 |
| 2005 | 0 | 335 | 147 | 319 | 0.0 | 8.8 | 1.4 | 12.4 |
| 2010 | 3 | 343 | 43 | 304 | 0.0 | 14.8 | 0.3 | 16.6 |
| 2015 | 17 | 383 | 83 | 331 | 0.5 | 13.7 | 0.5 | 12.9 |
| 2020 | - | 288 | 64 | 296 | - | 10.3 | 1.1 | 16.4 |
| 2025 | 2 | 348 | 94 | 315 | 0.0 | 16.0 | 1.0 | 19.2 |

**Table 17-59.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1994 | 13.9 | 0.6 | 47.4 | 1.5 | 5.5 | 42.7 |
| 2000 | 18.3 | 1.2 | 58.8 | 7.5 | 6.9 | 50.5 |
| 2005 | 21.3 | 0.3 | 41.5 | 4.2 | 5.0 | 36.8 |
| 2010 | 15.6 | 0.2 | 47.4 | 3.9 | 6.3 | 48.4 |
| 2015 | 22.0 | 0.6 | 28.1 | 10.0 | 3.7 | 45.6 |
| 2020 | 18.8 | 0.2 | 45.7 | 5.2 | 6.9 | 46.2 |
| 2025 | 14.9 | 0.6 | 43.9 | 7.0 | 6.3 | 47.5 |

**Table 17-59.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Coyote | Mule Deer | Rocky Mountain Elk | Greater Sage-Grouse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | | |
| 1994 | 6 | - | 19 | 25 | - | 2 | 16 |
| 2000 | 2 | - | 8 | 6 | - | 2 | 24 |
| 2005 | 3 | - | 6 | 13 | - | - | 10 |
| 2010 | 2 | - | 11 | 1 | 1 | - | 4 |
| 2015 | 3 | - | 6 | 5 | - | - | 30 |
| 2020 | 5 | - | 7 | 5 | - | - | 5 |
| 2025 | 5 | - | 10 | 5 | - | - | 9 |
| Year | Days Use Per Acre (ha) | | | | | | |
| 1994 | - | - | - | - | - | - | - |
| 2000 | 20.3 (50.2) | 8.7 (21.5)* | 14.7 (36.4) | 12.8 (31.5) | - | - | - |
| 2005 | 18.9 (46.6) | - | 11.4 (28.1) | 24.1 (59.6) | - | - | - |
| 2010 | 10.9 (26.9) | - | 18.7 (46.3) | 9.4 (23.2) | - | - | - |
| 2015 | 16.7 (41.2) | - | 4.7 (11.6) | 20.8 (51.3) | - | - | - |
| 2020 | 16.7 (41.2) | - | 10.7 (26.5) | 8.1 (19.9) | - | - | - |
| 2025 | 33.4 (82.5) | - | 19.4 (48.0) | 12.1 (29.8) | 8.7 (21.5)* | - | - |

*Pellets per acre (ha)

**Table 17-59.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum lettermanii (Letterman's needlegrass) | Achnatherum nelsonii (Columbia needlegrass) | Bromus porteri (Porter brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus lanceolatus (thickspike wheatgrass) | Elymus trachycaulus (slender wheatgrass) | Festuca idahoensis (Idaho fescue) | Koeleria macrantha (prairie Junegrass) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 1994 | 32 | - | 6 | 3 | 9 | 8 | - | - | - | 242 | 132 | - | - | - |
| 2000 | 70 | - | 7 | 9 | 46 | 101 | - | - | 1 | 86 | 85 | 111 | 12 | - |
| 2005 | 27 | 4 | 11 | 0 | 20 | 48 | 14 | - | 54 | 207 | 41 | 78 | 25 | - |
| 2010 | 14 | - | - | 3 | 31 | 144 | 2 | - | 9 | 159 | 39 | 86 | 20 | - |
| 2015 | 24 | - | 10 | 17 | 34 | 140 | 62 | 14 | 30 | 83 | 5 | 127 | 60 | 7 |
| 2020 | 6 | 2 | 1 | - | 20 | 66 | 55 | 7 | 22 | 102 | 5 | 66 | 42 | 5 |
| 2025 | 49 | 9 | - | 2 | 19 | 99 | - | 13 | 5 | 224 | 9 | 21 | 81 | - |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 1994 | 0.3 | - | 0.0 | 0.0 | 0.2 | 0.2 | - | - | - | 5.7 | 0.9 | - | - | - |
| 2000 | 1.2 | - | 0.0 | 0.1 | 0.7 | 1.1 | - | - | 0.0 | 2.4 | 1.5 | 2.6 | 0.1 | - |
| 2005 | 0.3 | 0.2 | 0.1 | 0.0 | 0.2 | 0.4 | 0.1 | - | 0.3 | 4.3 | 0.3 | 2.4 | 0.3 | - |
| 2010 | 0.3 | - | - | 0.0 | 0.4 | 2.4 | 0.1 | - | 0.2 | 8.5 | 0.3 | 2.4 | 0.3 | - |
| 2015 | 0.3 | - | 0.2 | 0.5 | 0.5 | 2.3 | 0.8 | 0.1 | 0.3 | 2.2 | 0.0 | 6.2 | 0.7 | 0.0 |
| 2020 | 0.2 | 0.0 | 0.0 | - | 0.3 | 0.6 | 0.9 | 0.3 | 0.3 | 5.5 | 0.2 | 1.2 | 0.8 | 0.2 |
| 2025 | 0.7 | 0.0 | - | 0.0 | 0.5 | 1.2 | - | 0.1 | 0.1 | 11.2 | 0.1 | 0.5 | 1.6 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-59.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Allium (onion) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria parvifolia (small-leaf pussytoes) | Arabis (rockcress) | Arabis drummondii (Drummond's rockcress) | Artemisia dracunculus (tarragon) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Astragalus tenellus (looseflower milkvetch) | Astragalus utahensis (Utah milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 34 | - | - | 2 | 3 | - | 12 | - | 9 | 25 | - | 60 | - | 3 | - | 7 | - |
| 2000 | 61 | - | - | 6 | 23 | - | 3 | - | - | 5 | - | 77 | 6 | - | - | 3 | - |
| 2005 | 24 | 3 | 4 | 46 | 27 | - | 48 | - | 9 | 23 | - | 25 | 12 | 26 | - | 5 | - |
| 2010 | 16 | - | - | 8 | 19 | - | - | - | - | 11 | - | 13 | 16 | - | - | 1 | - |
| 2015 | 38 | - | - | 83 | 34 | 10 | - | 10 | 14 | 22 | 15 | 34 | 9 | - | 0 | - | - |
| 2020 | 19 | 6 | - | 18 | 42 | 8 | 5 | 1 | - | 24 | 26 | 11 | 7 | 7 | 1 | 1 | - |
| 2025 | 16 | 3 | 2 | 6 | 42 | 9 | 4 | - | - | 14 | 3 | 41 | 23 | - | 8 | 1 | 8 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.2 | - | - | 0.0 | 0.1 | - | 0.0 | - | 0.1 | 0.3 | - | 1.1 | - | 0.0 | - | 0.2 | - |
| 2000 | 0.7 | - | - | 0.0 | 0.3 | - | 0.0 | - | - | 0.1 | - | 0.6 | 0.1 | - | - | 0.0 | - |
| 2005 | 0.3 | 0.0 | 0.0 | 0.1 | 0.2 | - | 0.1 | - | 0.1 | 0.1 | - | 0.1 | 0.1 | 0.1 | - | 0.0 | - |
| 2010 | 0.1 | - | - | 0.0 | 0.1 | - | - | - | - | 0.1 | - | 0.1 | 0.5 | - | - | 0.0 | - |
| 2015 | 0.7 | - | - | 0.5 | 0.5 | 0.1 | - | 0.0 | 0.2 | 0.1 | 0.3 | 0.4 | 0.0 | - | 0.0 | - | - |
| 2020 | 0.2 | 0.0 | - | 0.1 | 1.3 | 0.0 | 0.0 | 0.0 | - | 0.5 | 0.3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | - |
| 2025 | 0.2 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | - | - | 0.2 | 0.0 | 1.3 | 0.2 | - | 0.0 | 0.0 | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium album[a] (lambsquarters) | Cirsium (thistle) | Collinsia parviflora[a] (maiden blue eyed Mary) | Comandra umbellata (bastard toadflax) | Crepis acuminata (tapertip hawksbeard) | Cymopterus longipes (longstalk springparsley) | Delphinium nuttallianum (twolobe larkspur) | Descurainia pinnata[a] (western tansymustard) | Erigeron eatonii (Eaton's fleabane) | Erigeron flagellaris (trailing fleabane) | Eriogonum alatum (winged buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Gayophytum ramosissimum[a] (pinyon groundsmoke) | Gilia inconspicua[a] (shy gilia) | Hedysarum boreale (Utah sweetvetch) | Helianthella uniflora (oneflower helianthella) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | 7 | 1 | - | 44 | 14 | 3 | - | - | - | 65 | 1 | - | 3 | 3 | 2 | - | 1 |
| 2000 | 6 | - | 2 | - | 39 | - | - | - | - | 34 | 4 | - | 4 | 2 | - | 3 | 24 |
| 2005 | 2 | 1 | - | 5 | 20 | 8 | - | - | - | 72 | 22 | - | 4 | - | - | 1 | 3 |
| 2010 | 3 | - | - | 1 | 53 | 5 | - | - | 2 | 45 | 24 | - | 2 | - | - | 44 | - |
| 2015 | 1 | - | - | - | 48 | 24 | - | - | - | 28 | 13 | 6 | 2 | 1 | - | 4 | 4 |
| 2020 | - | - | - | 1 | 41 | 9 | - | 5 | - | 6 | 54 | - | 2 | 7 | - | 8 | 3 |
| 2025 | - | - | - | 8 | 63 | 31 | 16 | - | - | 73 | - | - | 10 | - | - | - | 3 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | 0.0 | 0.0 | - | 0.2 | 0.0 | 0.4 | - | - | - | 0.4 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 |
| 2000 | 0.1 | - | 0.0 | - | 0.3 | - | - | - | - | 0.1 | 0.0 | - | 0.1 | 0.0 | - | 0.0 | 0.4 |
| 2005 | 0.0 | 0.0 | - | 0.0 | 0.1 | 0.1 | - | - | - | 0.3 | 0.1 | - | 0.2 | - | - | 0.0 | 0.4 |
| 2010 | 0.0 | - | - | 0.0 | 0.6 | 0.0 | - | - | 0.0 | 0.3 | 0.2 | - | 0.0 | - | - | 0.4 | - |
| 2015 | 0.0 | - | - | - | 0.4 | 0.1 | - | - | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.5 |
| 2020 | - | - | - | 0.0 | 0.4 | 0.1 | - | 0.0 | - | 0.1 | 0.8 | - | 0.0 | 0.0 | - | 0.2 | 0.1 |
| 2025 | - | - | - | 0.0 | 1.2 | 0.6 | 0.1 | - | - | 0.7 | - | - | 0.1 | - | - | - | 0.7 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Ipomopsis aggregata (scarlet gilia) | Lomatium (desertparsley) | Lupinus argenteus (silvery lupine) | Machaeranthera canescens (hoary tansyaster) | Orthocarpus tolmiei[a] (Tolmie's owl's-clover) | Packera multilobata (lobeleaf groundsel) | Pedicularis (lousewort) | Penstemon caespitosus (mat penstemon) | Penstemon humilis (low beardtongue) | Penstemon watsonii (Watson's penstemon) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Senecio integerrimus[a] (lambstongue ragwort) | Silene drummondii (Drummond's campion) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1994 | - | - | 35 | 5 | - | 15 | - | 13 | 11 | 23 | 137 | 3 | 10 | 4 | 2 | 9 | 1 |
| 2000 | 2 | 2 | 35 | - | 1 | 103 | - | 24 | 13 | 19 | 156 | 1 | - | 11 | 2 | 8 | 6 |
| 2005 | 5 | - | 23 | 9 | 110 | 77 | - | 6 | - | 7 | 199 | 3 | 5 | 25 | 3 | 6 | - |
| 2010 | - | 3 | 31 | 3 | 26 | 20 | - | 16 | - | 14 | 199 | 4 | 6 | 29 | 6 | 3 | 2 |
| 2015 | - | - | 25 | 6 | 1 | 57 | 19 | 19 | 2 | 22 | 205 | 7 | 5 | 33 | 18 | - | - |
| 2020 | 2 | 17 | 12 | - | 34 | 18 | 15 | 7 | - | 8 | 186 | 11 | - | 17 | 3 | 15 | 5 |
| 2025 | - | 3 | 13 | - | - | 40 | 11 | 6 | - | 3 | 199 | - | 4 | 30 | 11 | 76 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1994 | - | - | 0.2 | 0.0 | - | 0.0 | - | 0.1 | 0.1 | 0.4 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2000 | 0.0 | 0.0 | 0.6 | - | 0.0 | 1.4 | - | 0.2 | 0.0 | 0.2 | 5.2 | 0.0 | - | 0.1 | 0.0 | 0.1 | 0.4 |
| 2005 | 0.0 | - | 1.1 | 0.1 | 1.2 | 0.6 | - | 0.0 | - | 0.2 | 6.2 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | - |
| 2010 | - | 0.0 | 0.5 | 0.0 | 0.3 | 0.3 | - | 0.1 | - | 0.1 | 12.2 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| 2015 | - | - | 0.7 | 0.0 | 0.0 | 0.3 | 0.1 | 0.2 | 0.0 | 0.3 | 6.8 | 0.0 | 0.1 | 0.2 | 0.1 | - | - |
| 2020 | 0.0 | 0.1 | 0.1 | - | 0.6 | 0.1 | 0.4 | 0.2 | - | 0.2 | 9.6 | 0.1 | - | 0.1 | 0.0 | 0.4 | 0.0 |
| 2025 | - | 0.0 | 0.1 | - | - | 0.6 | 0.1 | 0.2 | - | 0.1 | 10.7 | - | 0.0 | 0.3 | 0.1 | 0.9 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Thalictrum fendleri (Fendler's meadow-rue) | Zigadenus paniculatus (foothill deathcamas) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 1994 | 3 | 33 | 6 | 3 | 1 |
| 2000 | - | 15 | 31 | 8 | - |
| 2005 | - | 15 | 42 | 3 | 9 |
| 2010 | 1 | 4 | 16 | - | - |
| 2015 | - | 20 | 15 | 8 | 6 |
| 2020 | - | 36 | 2 | 4 | - |
| 2025 | - | 28 | 2 | - | 13 |
| year | Average Cover (%) | | | | |
| 1994 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 |
| 2000 | - | 0.2 | 0.2 | 0.1 | - |
| 2005 | - | 0.3 | 1.2 | 0.1 | 0.0 |
| 2010 | 0.0 | 0.3 | 0.1 | - | - |
| 2015 | - | 0.6 | 0.0 | 0.1 | 0.0 |
| 2020 | - | 0.7 | 0.0 | 0.0 | - |
| 2025 | - | 0.1 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-59.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. tridentata[p] (basin big sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Mahonia repens (creeping barberry) | Populus tremuloides[tp] (quaking aspen) | Purshia tridentata[p] (antelope bitterbrush) | Ribes[p] (currant) | Rosa woodsii[p] (Woods' rose) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | 0.9 | 4.5 | 17.8 | - | 0.5 | 5.3 | 0 | 0.3 | - | 0.1 | - | - | 0.5 | 0.1 |
| 2010 | 0.4 | 3.7 | 20.4 | - | 0.4 | 5.1 | - | 0.1 | - | 0.2 | 0.1 | 0.1 | 0.9 | 0.1 |
| 2015 | 0.1 | 2.2 | 24.7 | - | 0.6 | 3.9 | 0.6 | 0.6 | - | - | - | - | 2.1 | 0.1 |
| 2020 | 0.3 | 0.2 | 26 | - | 1.9 | 5.7 | 0.2 | 0.5 | - | 0.6 | - | - | 2.5 | 0.1 |
| 2025 | 0.5 | 7.1 | 17.8 | - | 0.2 | 5.9 | 0.1 | 0.2 | - | 0.6 | - | - | 4.7 | 0.1 |
| year | Quadrat Cover (%) | | | | | | | | | | | | | |
| 1994 | 0.2 | - | 21.7 | 0.0 | 0.2 | 3.7 | 0.0 | 0.7 | - | - | - | 0.0 | 2.6 | - |
| 2000 | 0.3 | 0.7 | 19.1 | - | 0.3 | 4.6 | 0.0 | 1.1 | - | - | - | 0.0 | 2.1 | 0.0 |
| 2005 | 0.2 | 2.2 | 12.8 | - | 0.5 | 3.5 | 0.0 | 0.9 | - | 0.0 | - | - | 0.2 | 0.0 |
| 2010 | 0.6 | 2.6 | 13.3 | 0.1 | 0.2 | 4.6 | - | 0.5 | - | 0.0 | 0.1 | 0.0 | 0.5 | 0.0 |
| 2015 | 0.0 | 0.8 | 17.9 | - | 0.9 | 3.6 | 0.6 | 1.1 | 0.1 | 0.1 | - | - | 0.7 | 0.0 |
| 2020 | 0.5 | 0.5 | 16.2 | - | 1.4 | 4.8 | 0.5 | 1.4 | - | 0.1 | - | - | 1.2 | 0.0 |
| 2025 | 0.5 | 3.0 | 14.5 | - | 1.1 | 4.7 | 0.0 | 0.5 | - | 0.1 | - | - | 2.5 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-59.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 1994 | 200 | - | 10 | 70 | 20 | 10 | 40 | 20 | 34/33 |
| 2000 | 200 | - | 50 | 40 | 10 | 40 | 10 | 30 | 42/47 |
| 2005 | 260 | 20 | 23 | 69 | 8 | 39 | 54 | 0 | 40/49 |
| 2010 | 320 | 20 | 31 | 63 | 6 | 6 | 50 | 13 | 37/46 |
| 2015 | 340 | - | 41 | 35 | 24 | 41 | 24 | 47 | 50/41 |
| 2020 | 280 | - | 50 | 36 | 14 | 14 | 64 | 29 | 39/41 |
| 2025 | 260 | - | 23 | 69 | 8 | 23 | 39 | 0 | - / - |
| Artemisia tridentata ssp. tridentata[P] -- (basin big sagebrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 154/114 |
| 2005 | 380 | - | 0 | 84 | 16 | 21 | 11 | 5 | 147/138 |
| 2010 | 280 | - | 0 | 100 | 0 | 50 | 0 | 0 | 151/190 |
| 2015 | 180 | - | 0 | 100 | 0 | 22 | 33 | 22 | 144/135 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 100 | 100 | 172/139 |
| 2025 | 640 | - | 9 | 56 | 34 | 56 | 19 | 44 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 1994 | 4640 | 40 | 11 | 64 | 25 | 8 | 1 | 7 | 72/87 |
| 2000 | 4600 | 80 | 17 | 72 | 11 | 17 | 0 | 4 | 70/89 |
| 2005 | 3820 | - | 2 | 57 | 41 | 28 | 7 | 25 | 61/79 |
| 2010 | 4000 | 20 | 7 | 81 | 13 | 46 | 4 | 18 | 65/83 |
| 2015 | 3560 | 80 | 4 | 66 | 30 | 43 | 33 | 69 | 63/89 |
| 2020 | 3320 | 60 | 7 | 76 | 18 | 19 | 37 | 31 | 73/103 |
| 2025 | 2900 | 80 | 8 | 75 | 18 | 38 | 18 | 34 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 1994 | 20 | - | 0 | 100 | 0 | 100 | 0 | 100 | 23/31 |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 40 | - | 50 | 50 | 0 | 50 | 50 | 0 | 50/62 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 1994 | 180 | - | 0 | 100 | 0 | 11 | 0 | 0 | 10/26 |
| 2000 | 300 | - | 0 | 100 | 0 | 7 | 0 | 0 | 8/18 |
| 2005 | 880 | - | 0 | 96 | 5 | 18 | 0 | 5 | 16/31 |
| 2010 | 360 | - | 6 | 94 | 0 | 0 | 0 | 0 | 15/34 |
| 2015 | 880 | - | 0 | 100 | 0 | 0 | 100 | 0 | 8/22 |
| 2020 | 1220 | - | 0 | 75 | 25 | 5 | 82 | 57 | 14/28 |
| 2025 | 1320 | - | 0 | 99 | 2 | 21 | 2 | 2 | - / - |
| Chrysothamnus viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 12/42 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 1994 | 4800 | - | 0 | 99 | 1 | 0 | 0 | 1 | 28/34 |
| 2000 | 4000 | - | 4 | 93 | 4 | 1 | 0 | 1 | 23/33 |
| 2005 | 3540 | 80 | 0 | 98 | 2 | 0 | 0 | 1 | 29/45 |
| 2010 | 3740 | - | 1 | 100 | 0 | 5 | 1 | 0 | 27/41 |
| 2015 | 3680 | - | 2 | 97 | 1 | 7 | 1 | 0 | 24/38 |
| 2020 | 2940 | - | 1 | 98 | 1 | 42 | 10 | 7 | 26/40 |
| 2025 | 2780 | - | 3 | 94 | 3 | 1 | 0 | 7 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1994 | 120 | - | 33 | 67 | 0 | 0 | 0 | 0 | 14/23 |
| 2000 | 240 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/17 |
| 2005 | 260 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/24 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 800 | - | 8 | 93 | 0 | 0 | 0 | 0 | 8/23 |
| 2020 | 680 | - | 3 | 97 | 0 | 0 | 0 | 0 | 14/22 |
| 2025 | 260 | 40 | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Mahonia repens -- (creeping barberry) | | | | | | | | | |
| 1994 | 4260 | - | 16 | 84 | 0 | 0 | 0 | 0 | 7/9 |
| 2000 | 6380 | - | 15 | 85 | 0 | 0 | 0 | 0 | 7/10 |
| 2005 | 4000 | - | 0 | 100 | 0 | 0 | 0 | 0 | 7/9 |
| 2010 | 920 | 60 | 70 | 30 | 0 | 0 | 0 | 0 | 7/15 |
| 2015 | 2300 | - | 33 | 67 | 0 | 0 | 0 | 0 | 9/8 |
| 2020 | 3800 | - | 9 | 91 | 0 | 0 | 0 | 0 | 7/9 |
| 2025 | 3580 | - | 37 | 63 | 1 | 0 | 0 | 1 | - / - |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Purshia tridentata[P] -- (antelope bitterbrush) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | 44/77 |
| 2000 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | 51/126 |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 27/49 |
| 2015 | 140 | - | 43 | 57 | 0 | 43 | 14 | 0 | 24/97 |
| 2020 | - | - | - | - | - | - | - | - | 47/86 |
| 2025 | 40 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Ribes[P] -- (currant) | | | | | | | | | |
| 1994 | - | - | - | - | - | - | - | - | -/- |
| 2000 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 26/22 |
| 2015 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | 12/4 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Rosa woodsii[p] -- (Woods' rose) | | | | | | | | | |
| 1994 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 18/18 |
| 2000 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | 48/21 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/35 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | 20 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 1994 | 1420 | - | 9 | 90 | 1 | 6 | 1 | 0 | 48/65 |
| 2000 | 920 | - | 20 | 80 | 0 | 2 | 0 | 2 | 41/49 |
| 2005 | 200 | - | 0 | 50 | 50 | 0 | 0 | 50 | 60/76 |
| 2010 | 520 | - | 42 | 58 | 0 | 0 | 0 | 12 | 31/36 |
| 2015 | 500 | - | 28 | 72 | 0 | 24 | 4 | 0 | 38/51 |
| 2020 | 700 | - | 49 | 51 | 0 | 31 | 0 | 0 | 36/46 |
| 2025 | 800 | - | 0 | 100 | 0 | 5 | 0 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 1994 | 40 | - | 0 | 0 | 100 | 100 | 0 | 100 | 10/10 |
| 2000 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 15/26 |
| 2010 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 25/29 |
| 2015 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 32/33 |
| 2020 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 14/20 |
| 2025 | 80 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-59.13a - Aspen Characteristics.** Characteristics of aspen populations including density, size class distribution, and vigor of plants.

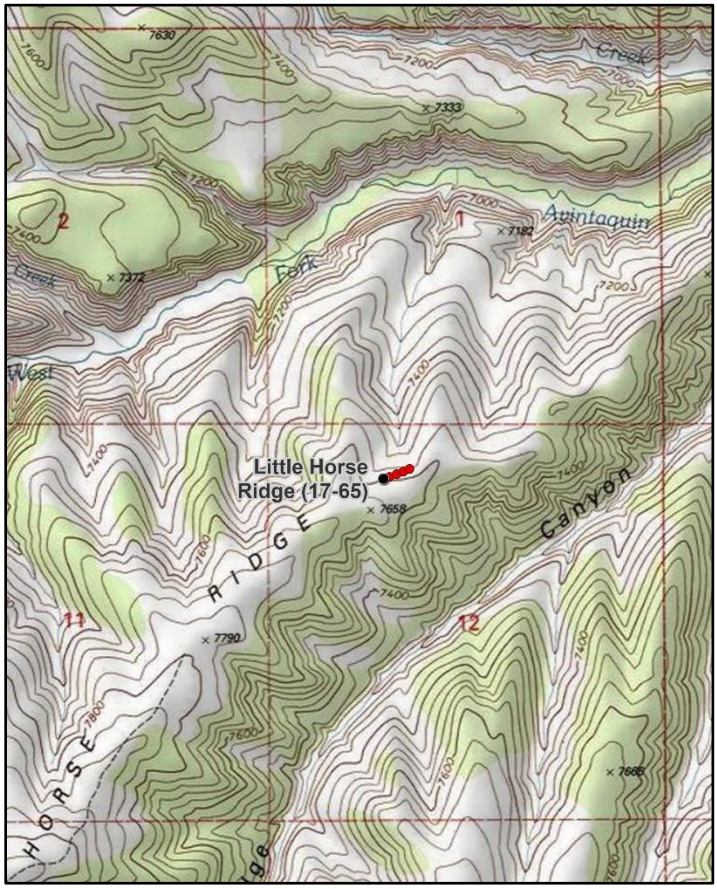
| Year | Density | Size Class Distribution | | | | Utilization | | Poor Vigor (%) |
|---|---|---|---|---|---|---|---|---|
| | Plants per Acre | Class I (%) | Class II (%) | Class III (%) | Class IV (%) | Moderate (%) | Heavy (%) | |
| Populus tremuloides (quaking aspen) | | | | | | | | |
| 2015 | 0 | - | - | - | - | 0 | 0 | 0 |

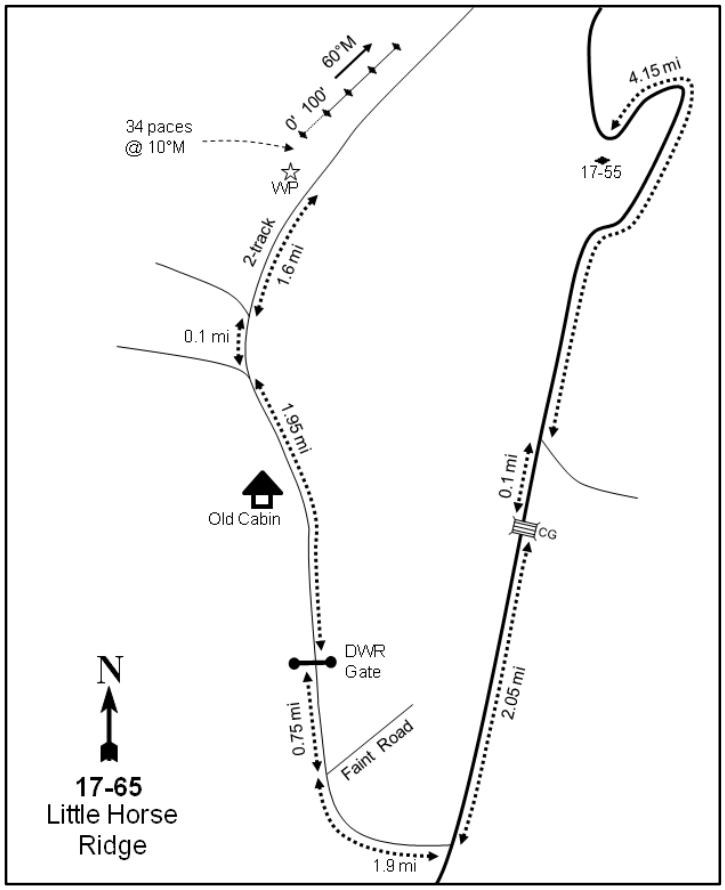
Class I - <= 1.5 feet; Class II - > 1.5 feet to 5 feet; Class III - > 5 feet and up to 1 inch diameter at breast height (dbh); Class IV - > 1 in diameter at breast height (dbh)

**Table 17-59.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 1 | - | - | - | 100 | - | 36.0 |
| 2025 | 1 | - | - | - | - | 100 | 36.0 |

# LITTLE HORSE RIDGE - STUDY NO. 17-65




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Gray Head Peak NW; Township 6S, Range 9W, Section 12 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 512912 East 4425446 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not Available |
| Transect Bearing | 60° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

***NOTE: UTV Recommended to access this site***

From Strawberry River Road, proceed south up Avintaquin Canyon for 12.7 miles. Turn left onto a road hidden in the trees and cross Avintaquin Creek. Go up Horse Ridge Canyon 0.4 miles to a fence. Continue up the ridge for 0.8 miles to a sharp left bend in the road by trend study 17-55. Continue south 4.2 miles to a fork in the road. Stay right and continue 0.1 miles to a cattle guard. After the cattle guard, travel 2.1 miles and turn right. Travel 1.9 miles to a faint fork in the road. Stay to the left and continue another 0.8 miles to a DWR gate. Pass through the gate and drive 2 miles, passing an old cabin on the left, to a fork in the road. Stay right and travel 0.1 miles to another fork. Take the two-track to the right and follow it for 1.6 miles to a witness post on the left-hand (west) side of the road. The 0-foot stake is 34 paces from the witness post at 10 degrees magnetic.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 7,610ft (2,320m) |
| Aspect | North-Northwest |
| lope | 15% |
| Sample Dates | 06/28/2005, 06/30/2010, 06/16/2015, 06/22/2020, 07/29/2025 |

## Wildlife Habitat and Vegetation History

**Table 17-65.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | year-long |
| Shiras Moose | substantial | summer |
| Rocky Mountain Bighorn | RMBS | year-long |

**Table 17-65.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2005 | Alderleaf Mountain Mahogany/Perennial Grass | Phase I |
| 2010 | Pinyon/Alderleaf Mountain Mahogany/Perennial Grass | Phase I transitioning to Phase II |
| 2015 | Pinyon/Alderleaf Mountain Mahogany/Perennial Grass | Phase I transitioning to Phase II |
| 2020 | Pinyon/Alderleaf Mountain Mahogany/Perennial Grass | Phase II |
| 2025 | Pinyon/Alderleaf Mountain Mahogany/Perennial Grass | Phase II |

## Site Notes

This study was established in 2005 to monitor deer that are staying in the high country during winter instead of migrating lower. This herd has a high mortality rate for not only fawns, but adults as well. Grazing has not occurred on the WMA for several decades.

## Soils

**Table 17-65.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.4 | 25.1 | 41.7 | 33.2 | 3.5 | 5.2 | 220.8 | 0.7 | 06/28/2005 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 18 inches |
| NRCS Ecological Site | Mountain Stony Loam (Browse) |
| NRCS Ecological Site # | No Data |
| States and Transitions | No state and transition model is available for this ecological site. |

Since study establishment in 2005, this site has been dominated by alderleaf mountain mahogany (*Cercocarpus montanus*); other browse species have also been present in lesser amounts. In 2010, cover of twoneedle pinyon (*Pinus edulis*) increased and it became a co-dominant overstory species with mountain mahogany (Table 17-65.12). The herbaceous understory has remained abundant and has been a dominant vegetation component throughout the study years (Table 17-65.7). Though not particularly diverse, perennial grasses have provided much of the herbaceous cover with saline wildrye (*Leymus salinus*) as the most abundant species (Table 17-65.10). Forbs have remained diverse, but not particularly abundant (Table 17-65.11). Twoneedle pinyon has continued to encroach in the area, with tree cover exhibiting an overall increase between 2005 and 2025 (Table 17-65.6); the site has been considered to be within Phase II of woodland succession since 2020 (Table 17-65.4). Without a tree-removing disturbance, however, the community will likely transition to later phases of woodland succession in the future which could result in the loss of beneficial browse for wildlife.

Deer winter range condition on this site has fluctuated between good and excellent since 2005; the study site was considered to be in good-excellent condition in 2025 (Table 17-65.15). The sagebrush component of this site could provide valuable browse for wildlife during the winter months (Table 17-65.3). Although this site falls within the perimeters of currently-mapped mule deer winter range, it is also in the proximity of year-long habitat. As such, the alderleaf mountain mahogany population could also be valuable to wildlife during transitional periods. However, pellet transect data indicates that deer presence has been low to moderate over the course of the study, while elk presence has been remained low over the same period (Table 17-65.9). Utilization of alderleaf mountain mahogany has generally been moderate. Sixty percent of alderleaf mountain mahogany plants sampled in density strips were moderately to heavily hedged in 2025, although that percentage has been both higher and lower in the past. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) utilization has also been largely moderate, with 50% of plants showing signs of moderate to heavy utilization in the most recent sample year (2025) (Table 17-65.13). Additional on-site observations for 2025 note little to no utilization on grass and forb species.

## Trend Summary Tables

**Table 17-65.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2005 | 14.4 | 2.4 | 5.5 | 18.6 | 1.9 | 7.4 |
| 2010 | 14.2 | 2.5 | 6.1 | 17.1 | 3.1 | 13.3 |
| 2015 | 20.7 | 1.7 | 9.4 | 23.5 | 1.9 | 15.2 |
| 2020 | 19.9 | 4.2 | 11.5 | 27.8 | 3.6 | 26.0 |
| 2025 | 21.6 | 2.2 | 11.2 | 30.1 | 2.0 | 20.2 |

**Table 17-65.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2005 | - | 347 | 15 | 162 | - | 16.3 | 0.1 | 2.5 |
| 2010 | - | 327 | - | 160 | - | 17.3 | - | 3.8 |
| 2015 | - | 358 | 16 | 192 | - | 23.0 | 0.1 | 3.4 |
| 2020 | - | 380 | 1 | 163 | - | 24.2 | 0.0 | 3.7 |
| 2025 | - | 373 | 13 | 143 | - | 26.0 | 0.0 | 2.2 |

**Table 17-65.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2005 | 15.7 | 1.2 | 35.8 | 16.8 | 3.6 | 39.6 |
| 2010 | 13.1 | 0.0 | 52.0 | 16.4 | 3.4 | 42.1 |
| 2015 | 20.0 | 0.1 | 42.6 | 14.6 | 8.0 | 54.1 |
| 2020 | 9.2 | 0.1 | 35.3 | 17.9 | 5.8 | 55.4 |
| 2025 | 10.7 | 0.6 | 52.5 | 12.0 | 7.5 | 51.8 |

**Table 17-65.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Horse | Shiras Moose | Rabbit |
|---|---|---|---|---|---|---|
| | Quadrat Frequency | | | | | |
| 2005 | - | 17 | - | 3 | 2 | 53 |
| 2010 | - | 14 | 7 | - | - | 8 |
| 2015 | - | 6 | 2 | - | - | 23 |
| 2020 | - | 16 | 5 | - | 3 | 19 |
| 2025 | - | 18 | 3 | - | 2 | 17 |
| Year | Days Use Per Acre (ha) | | | | | |
| 2005 | 2.2 (5.4) | 33.5 (82.8) | 2.7 (6.6) | 6.4 (15.8) | 1.0 (2.4) | - |
| 2010 | - | 34.9 (86.1) | 11.4 (28.1) | - | - | - |
| 2015 | - | 20.1 (49.7) | 4.7 (11.6) | - | 1.0 (2.4) | - |
| 2020 | - | 34.2 (84.4) | 10.7 (26.5) | - | 3.4 (8.4) | - |
| 2025 | - | 40.2 (99.3) | 3.4 (8.3) | - | - | - |

**Table 17-65.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Carex rossii (Ross' sedge) | Elymus lanceolatus (thickspike wheatgrass) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Pseudoroegneria spicata (bluebunch wheatgrass) |
|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | |
| 2005 | 10 | - | - | 247 | 41 | 6 | 168 |
| 2010 | 0 | - | - | 251 | 25 | 2 | 98 |
| 2015 | 5 | 7 | - | 233 | 58 | 5 | 162 |
| 2020 | 49 | 6 | 8 | 260 | - | 3 | 164 |
| 2025 | 5 | - | 75 | 180 | 1 | 2 | 152 |
| year | Average Cover (%) | | | | | | |
| 2005 | 0.1 | - | - | 9.0 | 0.4 | 0.1 | 6.8 |
| 2010 | 0.0 | - | - | 12.2 | 0.5 | 0.0 | 4.6 |
| 2015 | 0.0 | 0.0 | - | 11.8 | 1.5 | 0.0 | 9.7 |
| 2020 | 1.2 | 0.0 | 0.0 | 15.8 | - | 0.2 | 6.9 |
| 2025 | 0.4 | - | 2.7 | 12.5 | 0.0 | 0.0 | 10.5 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-65.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus (milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus megacarpus (great bladdery milkvetch) | Astragalus tenellus (looseflower milkvetch) | Calochortus nuttallii (sego lily) | Castilleja angustifolia (northwestern Indian paintbrush) | Castilleja flava (yellow Indian paintbrush) | Castilleja linariifolia (Wyoming Indian paintbrush) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) | Crepis acuminata (tapertip hawksbeard) | Cymopterus longipes (longstalk springparsley) | Erigeron (fleabane) | Erigeron eatonii (Eaton's fleabane) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2005 | 15 | - | - | 7 | 10 | - | - | 11 | 13 | - | - | 2 | - | 72 | 3 | - | - |
| 2010 | - | 1 | - | - | - | - | - | 5 | 3 | 19 | - | - | - | 71 | 9 | 7 | - |
| 2015 | 16 | - | - | - | 9 | - | - | - | - | 10 | - | - | - | 96 | 8 | 2 | - |
| 2020 | 1 | - | - | 2 | 5 | - | - | 0 | 17 | 9 | - | - | 3 | 86 | 1 | 7 | 8 |
| 2025 | 12 | 3 | 1 | - | 7 | 1 | 3 | - | - | 10 | 1 | - | 0 | 35 | 2 | - | 6 |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2005 | 0.1 | - | - | 0.1 | 0.1 | - | - | 0.0 | 0.0 | - | - | 0.0 | - | 0.7 | 0.0 | - | - |
| 2010 | - | 0.0 | - | - | - | - | - | 0.0 | 0.0 | 0.5 | - | - | - | 0.9 | 0.0 | 0.1 | - |
| 2015 | 0.1 | - | - | - | 0.1 | - | - | - | - | 0.1 | - | - | - | 1.0 | 0.0 | 0.0 | - |
| 2020 | 0.0 | - | - | 0.0 | 0.0 | - | - | 0.0 | 0.1 | 0.3 | - | - | 0.1 | 1.4 | 0.0 | 0.0 | 0.0 |
| 2025 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.2 | 0.0 | - | 0.0 | 0.2 | 0.0 | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Eriogonum (buckwheat) | Eriogonum umbellatum (sulphur-flower buckwheat) | Ipomopsis aggregata (scarlet gilia) | Linum lewisii (Lewis flax) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Physaria (twinpod) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 2005 | - | - | 4 | - | 1 | 30 | 8 | 8 | 59 | - | - | - | 2 | 9 |
| 2010 | - | 1 | - | - | - | 28 | 12 | 9 | 60 | - | - | - | 12 | 6 |
| 2015 | 6 | - | 1 | 2 | 10 | 24 | 5 | 7 | 77 | 2 | - | 6 | 21 | 9 |
| 2020 | - | - | - | - | 4 | 25 | 6 | 6 | 62 | 2 | - | 2 | 3 | - |
| 2025 | - | - | 1 | - | 3 | 20 | 3 | 2 | 74 | - | 1 | - | - | 9 |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 2005 | - | - | 0.0 | - | 0.0 | 0.7 | 0.0 | 0.0 | 0.6 | - | - | - | 0.0 | 0.1 |
| 2010 | - | 0.0 | - | - | - | 0.3 | 0.1 | 0.0 | 1.6 | - | - | - | 0.2 | 0.1 |
| 2015 | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.6 | 0.1 | 0.0 | 1.1 | 0.0 | - | 0.1 | 0.1 | 0.1 |
| 2020 | - | - | - | - | 0.0 | 0.3 | 0.0 | 0.0 | 1.2 | 0.0 | - | 0.0 | 0.0 | - |
| 2025 | - | - | 0.0 | - | 0.0 | 0.1 | 0.0 | 0.0 | 1.2 | - | 0.0 | - | - | 0.3 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-65.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Cercocarpus montanus[p] (alderleaf mountain mahogany) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Pediocactus simpsonii (mountain ball cactus) | Pinus edulis[t] (twoneedle pinyon) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | |
| 2005 | 2.7 | 4.5 | 10.4 | - | 1.6 | - | - | - | 7.4 | 1 | 0.3 |
| 2010 | 1.7 | 3.7 | 10.8 | - | 2.3 | - | 0.4 | - | 13.3 | 0.9 | 0.4 |
| 2015 | 2.8 | 5.2 | 13.4 | - | 1.6 | - | 0 | - | 15.2 | 2.1 | 0.3 |
| 2020 | 2.1 | 5.4 | 18.6 | 0 | 3.3 | - | 0.3 | - | 26 | 1.7 | 0 |
| 2025 | 3.9 | 4.8 | 18.2 | 0.2 | 1.8 | - | 0 | - | 20.2 | 3 | 0.2 |
| year | Quadrat Cover (%) | | | | | | | | | | |
| 2005 | 1.7 | 5.2 | 6.4 | - | 1.8 | 0.0 | 0.2 | - | 5.5 | 1.0 | 0.4 |
| 2010 | 1.8 | 4.0 | 6.9 | 0.2 | 1.7 | - | 0.4 | 0.0 | 6.1 | 1.3 | 0.4 |
| 2015 | 1.0 | 2.6 | 15.4 | 0.1 | 1.3 | - | 0.1 | 0.0 | 9.4 | 1.7 | 0.2 |
| 2020 | 1.4 | 4.4 | 12.8 | 0.1 | 3.4 | - | 0.4 | - | 11.5 | 1.2 | 0.4 |
| 2025 | 2.3 | 3.7 | 12.5 | 0.7 | 1.8 | - | 0.1 | - | 11.2 | 2.3 | 0.3 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-65.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[P] -- (Utah serviceberry) | | | | | | | | | |
| 2005 | 400 | 20 | 40 | 60 | 0 | 25 | 20 | 0 | 125/122 |
| 2010 | 400 | 20 | 25 | 75 | 0 | 40 | 5 | 0 | 124/132 |
| 2015 | 380 | 40 | 11 | 79 | 11 | 26 | 16 | 11 | 116/117 |
| 2020 | 500 | 20 | 36 | 60 | 4 | 24 | 20 | 12 | 127/118 |
| 2025 | 620 | 40 | 42 | 58 | 0 | 16 | 3 | 3 | - / - |
| Artemisia tridentata ssp. vaseyana[P] -- (mountain big sagebrush) | | | | | | | | | |
| 2005 | 1460 | 460 | 16 | 43 | 41 | 41 | 10 | 22 | 64/81 |
| 2010 | 1480 | 340 | 23 | 51 | 26 | 26 | 11 | 24 | 57/77 |
| 2015 | 1660 | 100 | 40 | 39 | 22 | 19 | 18 | 21 | 54/70 |
| 2020 | 1640 | - | 40 | 50 | 10 | 6 | 7 | 13 | 58/75 |
| 2025 | 1620 | - | 6 | 73 | 21 | 24 | 26 | 28 | - / - |
| Cercocarpus montanus[P] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2005 | 2600 | 1280 | 45 | 54 | 2 | 17 | 65 | 1 | 109/104 |
| 2010 | 2160 | 5500 | 29 | 70 | 1 | 26 | 29 | 1 | 109/100 |
| 2015 | 2660 | 1300 | 53 | 46 | 2 | 35 | 14 | 3 | 119/111 |
| 2020 | 2180 | 600 | 35 | 63 | 2 | 20 | 18 | 2 | 124/119 |
| 2025 | 2100 | 160 | 25 | 74 | 1 | 48 | 12 | 2 | - / - |
| Chrysothamnus depressus[P] -- (longflower rabbitbrush) | | | | | | | | | |
| 2005 | 140 | - | 0 | 100 | 0 | 57 | 0 | 0 | 10/14 |
| 2010 | 120 | - | 17 | 67 | 17 | 0 | 0 | 17 | 18/28 |
| 2015 | 200 | - | 10 | 90 | 0 | 20 | 40 | 0 | 6/11 |
| 2020 | 280 | - | 0 | 100 | 0 | 14 | 0 | 0 | 10/16 |
| 2025 | 340 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2005 | 2400 | 40 | 8 | 93 | 0 | 3 | 0 | 0 | 25/27 |
| 2010 | 2060 | 20 | 10 | 90 | 0 | 0 | 0 | 0 | 30/36 |
| 2015 | 2420 | 40 | 19 | 79 | 2 | 11 | 15 | 3 | 22/26 |
| 2020 | 2680 | 40 | 6 | 94 | 0 | 1 | 0 | 0 | 31/36 |
| 2025 | 2200 | - | 10 | 89 | 1 | 3 | 0 | 19 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[P] -- (rubber rabbitbrush) | | | | | | | | | |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/10 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2005 | 300 | - | 27 | 73 | 0 | 0 | 0 | 0 | 14/14 |
| 2010 | 900 | - | 9 | 91 | 0 | 0 | 0 | 0 | 14/16 |
| 2015 | 840 | 20 | 76 | 24 | 0 | 0 | 0 | 0 | 12/13 |
| 2020 | 1500 | - | 5 | 95 | 0 | 0 | 0 | 0 | 15/17 |
| 2025 | 640 | - | 16 | 84 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2005 | - | 40 | 0 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/42 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 1/6 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 2005 | 240 | 20 | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 220 | 20 | 27 | 73 | 0 | 0 | 0 | 18 | - / - |
| 2015 | 340 | 20 | 47 | 53 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 320 | 20 | 69 | 31 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 280 | 40 | 21 | 79 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | 23/28 |
| 2010 | - | - | - | - | - | - | - | - | 38/69 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 40/67 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2005 | 720 | 20 | 25 | 72 | 3 | 3 | 3 | 3 | 39/56 |
| 2010 | 680 | 140 | 32 | 68 | 0 | 3 | 0 | 3 | 42/66 |
| 2015 | 1200 | 60 | 40 | 60 | 0 | 18 | 0 | 0 | 37/55 |
| 2020 | 800 | - | 33 | 68 | 0 | 3 | 15 | 0 | 35/57 |
| 2025 | 1120 | - | 14 | 86 | 0 | 5 | 13 | 0 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2005 | 720 | 20 | 8 | 72 | 19 | 19 | 6 | 17 | 22/24 |
| 2010 | 460 | 80 | 17 | 74 | 9 | 0 | 0 | 13 | 23/24 |
| 2015 | 200 | 20 | 60 | 40 | 0 | 0 | 30 | 0 | 23/25 |
| 2020 | 440 | - | 41 | 59 | 0 | 0 | 0 | 5 | 26/27 |
| 2025 | 340 | - | 24 | 77 | 0 | 0 | 6 | 12 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

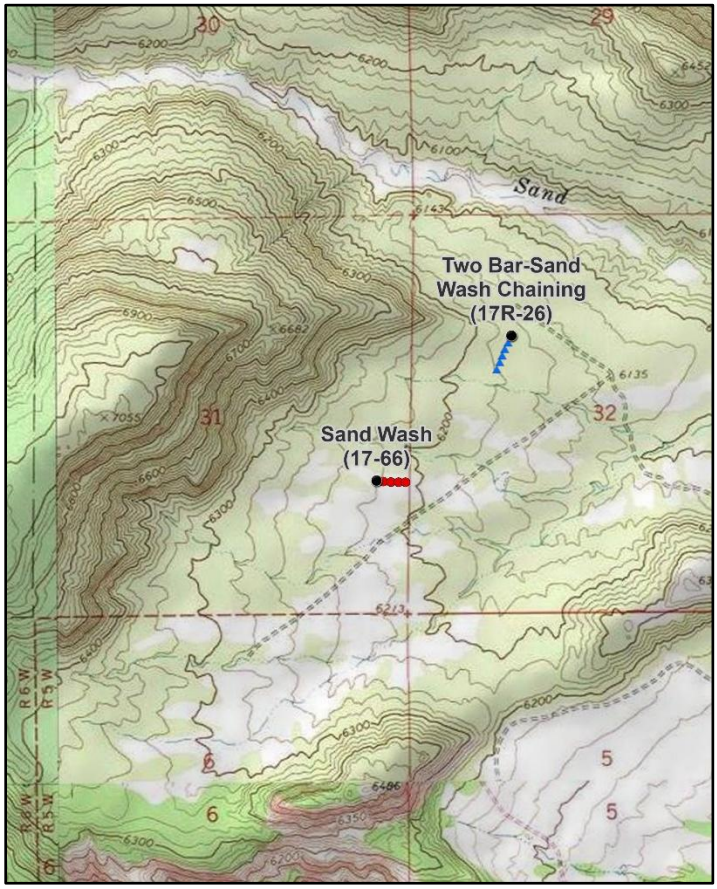
**Table 17-65.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

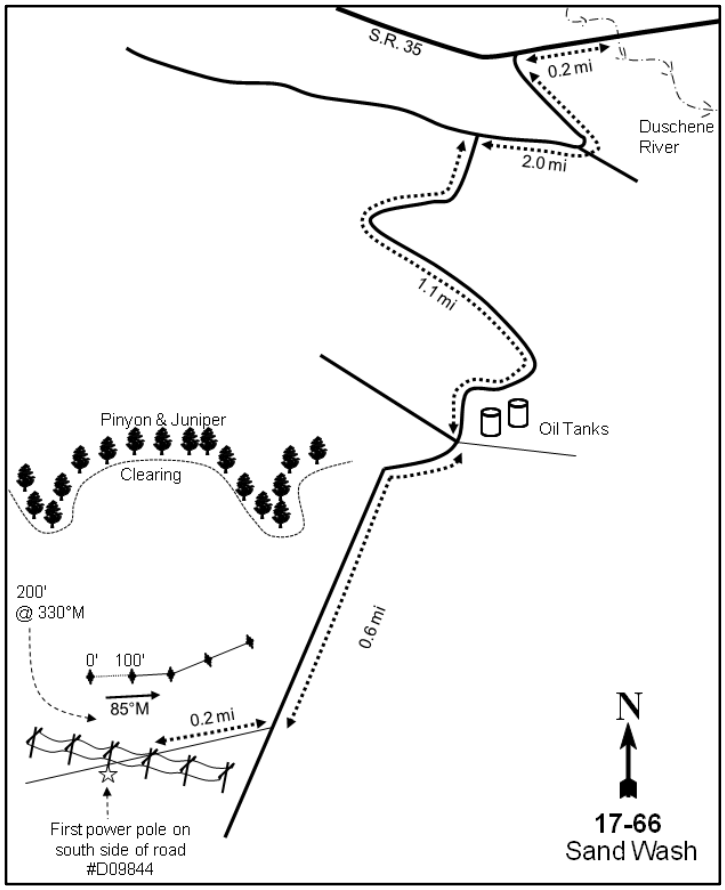
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2020 | 4 | - | 100 | - | - | - | 3.0 |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2015 | 6 | - | - | 67 | 33 | - | 11.3 |
| 2020 | 13 | - | 29 | 57 | 14 | - | 7.6 |
| 2025 | 12 | - | 17 | 50 | 17 | 17 | 6.3 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2005 | 233 | - | 50 | 25 | 15 | 10 | 6.9 |
| 2010 | 193 | 5 | 20 | 40 | 35 | - | 7.8 |
| 2015 | 262 | 10 | 25 | 20 | 25 | 20 | 8.5 |
| 2020 | 257 | 5 | 32 | 26 | 16 | 21 | 9.2 |
| 2025 | 241 | - | 21 | 11 | 26 | 42 | 8.6 |

**Table 17-65.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | 26.3 | 11.7 | 15.0 | 30.0 | 0.0 | 4.9 | 0.0 | **87.9** | Good |
| 2010 | 24.3 | 13.2 | 13.6 | 30.0 | 0.0 | 7.6 | 0.0 | **88.7** | Good-Excellent |
| 2015 | 30.0 | 12.9 | 15.0 | 30.0 | 0.0 | 6.8 | 0.0 | **94.7** | Excellent |
| 2020 | 30.0 | 13.9 | 15.0 | 30.0 | 0.0 | 7.4 | 0.0 | **96.3** | Excellent |
| 2025 | 30.0 | 13.8 | 11.4 | 30.0 | 0.0 | 4.4 | 0.0 | **89.6** | Good-Excellent |

# SAND WASH - STUDY NO. 17-66




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Talmage SW; Township 2S, Range 5W, Section 31 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 543761 East 4456848 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | Not available |
| Transect Bearing | 85° magnetic |
| Length | 400ft |
| Belt Placement | Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From State Route (SR) 87, turn onto SR-35 and go west toward the Duchesne River. 0.2 miles after crossing the Duchesne River, turn left onto a road heading south. Travel 2.0 miles to a fork in the road and stay to the left. Continue another 1.1 miles to a fork that goes to some oil tanks. Drive straight for 0.6 miles to another fork. Go to the right and drive 0.2 miles to the first power pole on the south side of the road that is marked with #D09844. From here walk 200 feet at 330 degrees magnetic to the 0-foot stake.

## Site Information

| | |
|---|---|
| Land Ownership | Private |
| Land Administrator | Private |
| Allotment | No data |
| Elevation | 6,230ft (1,899m) |
| Aspect | Northeast |
| Slope | 3-4% |
| Sample Dates | 07/11/2005, 06/29/2010, 06/17/2015, 07/28/2025 |

## Wildlife Habitat and Vegetation History

**Table 17-66.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 17-66.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2005 | Perennial Grass/Wyoming Big Sagebrush | Phase I |
| 2010 | Perennial Grass/Wyoming Big Sagebrush | Phase I |
| 2015 | Perennial Grass/Wyoming Big Sagebrush | Phase I |
| 2025 | Perennial Grass/Wyoming Big Sagebrush | Phase I |

## Site Notes

No Notes

## Soils

**Table 17-66.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 7.7 | 64.7 | 17.1 | 18.2 | 0.6 | 6.4 | 64.0 | 0.5 | 07/11/2006 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 10 inches |
| NRCS Ecological Site | Upland Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R048AY306UT |
| States and Transitions | 2005-2025 - Current Potential State: Community Phase 2.1 |

The plant community on this site has existed as a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) community type with a herbaceous understory dominated by native perennial grasses since study establishment in 2005 (Table 17-66.7, Table 17--66.12). Forbs have been moderately diverse, but they have been scarce in comparison with grasses (Table 17-66.11). Although densities of twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have remained fairly stable throughout the sample years, juniper cover has exhibited a slight overall increase (Table 17-66.12, Table 17-66.14); there could be potential for further encroachment over time without a tree-removing disturbance. However, the site has been considered to be within Phase I of woodland succession since study establishment (Table 17-66.4).

Deer winter range condition on this site has fluctuated between poor and fair-good since 2005; the study site was considered to be in fair-good condition in 2025. Improvement to deer winter range could be accomplished through efforts that support preferred browse reproduction within the population. Diversifying and increasing the native perennial forb populations would also improve winter range conditions (Table 17-66.11, Table 17-66.12, Table 17-66.13, Table 17-66.15). The sagebrush component of this site could provide valuable browse for elk and deer during the winter months (Table 17-66.3). However, pellet transect data indicates that elk and deer presence has ranged between low and moderate in most years sampled; wildlife presence was at its highest in 2010 (Table 17-66.9). Sagebrush utilization has fluctuated from year to year, but 49% of sagebrush plants sampled in density strips were moderately to heavily hedged in 2025 (Table 17-66.13). Additional on-site observations for 2025 note light utilization (10-20%) on needle and thread, but little to no utilization forb species.

## Trend Summary Tables

**Table 17-66.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2005 | 3.5 | 0.3 | 1.8 | 4.8 | 0.2 | 4.5 |
| 2010 | 3.9 | 0.1 | 2.5 | 5.8 | 0.6 | 3.9 |
| 2015 | 3.5 | 0.7 | 2.5 | 5.8 | 1.1 | 4.4 |
| 2025 | 5.3 | 1.0 | 3.4 | 8.3 | 0.6 | 7.1 |

**Table 17-66.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2005 | 3 | 365 | 90 | 43 | 0.0 | 17.2 | 0.8 | 0.6 |
| 2010 | 2 | 340 | 65 | 30 | 0.0 | 26.7 | 0.5 | 0.4 |
| 2015 | 5 | 377 | 89 | 15 | 0.0 | 21.8 | 0.5 | 0.2 |
| 2025 | 6 | 365 | 7 | 21 | 0.0 | 27.7 | 0.0 | 0.3 |

**Table 17-66.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2005 | 50.8 | 2.9 | 27.6 | 0.2 | 0.1 | 25.4 |
| 2010 | 44.9 | 2.1 | 38.0 | 0.1 | - | 36.7 |
| 2015 | 46.1 | 5.3 | 29.3 | 0.1 | 0.1 | 28.9 |
| 2025 | 49.2 | 5.3 | 22.0 | 0.5 | 0.0 | 36.0 |

**Table 17-66.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2005 | 1 | 19 | 26 | 50 |
| 2010 | 4 | 29 | 29 | 40 |
| 2015 | 3 | 20 | 1 | 66 |
| 2025 | - | 27 | 7 | 37 |
| Year | Days Use Per Acre (ha) | | | |
| 2005 | - | 20.8 (51.3) | 19.4 (48.0) | - |
| 2010 | 2.9 (7.2) | 44.9 (110.9) | 34.2 (84.4) | - |
| 2015 | 2.9 (7.2) | 9.4 (23.2) | 3.4 (8.3) | - |
| 2025 | - | 30.8 (76.1) | 2.7 (6.6) | - |

**Table 17-66.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Bouteloua gracilis (blue grama) | Elymus elymoides (squirreltail) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Koeleria macrantha (prairie Junegrass) | Leymus salinus (saline wildrye) | Pleuraphis jamesii (James' galleta) | Sporobolus cryptandrus (sand dropseed) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | |
| 2005 | 4 | 8 | 1 | - | 319 | - | 71 | 134 | - | 3 |
| 2010 | 4 | 26 | 8 | - | 283 | - | 23 | 154 | - | 2 |
| 2015 | 2 | 63 | - | 3 | 351 | 11 | 2 | 155 | - | 5 |
| 2025 | - | 9 | - | 13 | 257 | - | 7 | 241 | 2 | 6 |
| year | Average Cover (%) | | | | | | | | | |
| 2005 | 0.0 | 0.1 | 0.0 | - | 12.8 | - | 0.7 | 3.6 | - | 0.0 |
| 2010 | 0.2 | 0.7 | 0.1 | - | 19.8 | - | 0.7 | 5.2 | - | 0.0 |
| 2015 | 0.1 | 2.5 | - | 0.0 | 15.7 | 0.1 | 0.0 | 3.5 | - | 0.0 |
| 2025 | - | 0.0 | - | 0.1 | 13.9 | - | 0.8 | 12.9 | 0.0 | 0.0 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-66.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Allium (onion) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium album[a] (lambsquarters) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Cryptantha (cryptantha) | Cryptantha[a] (annual cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum (buckwheat) | Eriogonum cernuum[a] (nodding buckwheat) | Hymenopappus filifolius (fineleaf hymenopappus) | Lappula occidentalis[a] (flatspine stickseed) | Navarretia intertexta[a] (needleleaf navarretia) | Penstemon pachyphyllus (thickleaf beardtongue) | Phlox austromontana (mountain phlox) | Salsola tragus[ai] (prickly Russian thistle) | Schoenocrambe linifolia (flaxleaf plainsmustard) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2005 | - | - | 7 | 2 | 3 | 1 | - | 10 | - | 57 | - | 17 | 11 | - | 2 | - | - |
| 2010 | 4 | 2 | 7 | 3 | 1 | 2 | - | 1 | 1 | 16 | - | 15 | 30 | - | 2 | - | - |
| 2015 | - | - | - | - | - | 1 | 12 | 34 | - | - | - | 18 | 36 | - | 1 | 1 | 3 |
| 2025 | - | - | - | - | - | - | - | - | 2 | - | 4 | - | 3 | 2 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2005 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | 0.2 | - | 0.5 | 0.1 | - | 0.0 | - | - |
| 2010 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | - | 0.0 | 0.0 | 0.0 | - | 0.3 | 0.1 | - | 0.0 | - | - |
| 2015 | - | - | - | - | - | 0.0 | 0.1 | 0.2 | - | - | - | 0.1 | 0.1 | - | 0.1 | 0.0 | 0.0 |
| 2025 | - | - | - | - | - | - | - | - | 0.1 | - | 0.0 | - | 0.0 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Sphaeralcea coccinea (scarlet globemallow) | Stenotus acaulis (stemless mock goldenweed) | Tetraneuris acaulis (stemless four-nerve daisy) | Townsendia incana (hoary Townsend daisy) | Tragopogon dubius[ai] (yellow salsify) |
|---|---|---|---|---|---|
| year | Nested Frequency | | | | |
| 2005 | 11 | 14 | 11 | 8 | - |
| 2010 | 15 | - | - | 5 | 5 |
| 2015 | 9 | - | - | 1 | 2 |
| 2025 | 13 | - | - | - | 4 |
| year | Average Cover (%) | | | | |
| 2005 | 0.1 | 0.3 | 0.1 | 0.0 | - |
| 2010 | 0.2 | - | - | 0.0 | 0.0 |
| 2015 | 0.0 | - | - | 0.0 | 0.0 |
| 2025 | 0.1 | - | - | - | 0.0 |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-66.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Krascheninnikovia lanata[p] (winterfat) | Linanthus pungens (granite prickly phlox) | Opuntia fragilis (brittle pricklypear) | Sclerocactus (fishhook cactus) | Yucca (yucca) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 2005 | 4.8 | - | 4.5 | - | - | 0.2 | - | - |
| 2010 | 5.8 | 0.1 | 3.9 | - | - | 0.4 | - | 0.1 |
| 2015 | 5.8 | - | 4.4 | - | - | 0.8 | - | 0.3 |
| 2025 | 8.3 | - | 7.1 | - | - | 0.6 | - | 0 |
| year | Quadrat Cover (%) | | | | | | | |
| 2005 | 3.4 | - | 1.8 | 0.1 | 0.0 | 0.2 | 0.0 | 0.1 |
| 2010 | 3.9 | 0.0 | 2.5 | - | 0.0 | 0.1 | - | 0.0 |
| 2015 | 3.5 | 0.0 | 2.5 | - | - | 0.7 | - | 0.0 |
| 2025 | 5.3 | 0.1 | 3.4 | - | 0.0 | 0.6 | - | 0.4 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-66.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[p] -- (Wyoming big sagebrush) | | | | | | | | | |
| 2005 | 1120 | - | 0 | 23 | 77 | 43 | 20 | 48 | 41/70 |
| 2010 | 1540 | 40 | 17 | 38 | 46 | 39 | 10 | 51 | 40/65 |
| 2015 | 1860 | 20 | 13 | 46 | 41 | 20 | 54 | 13 | 31/59 |
| 2025 | 3420 | 180 | 27 | 55 | 18 | 48 | 1 | 18 | - / - |
| Grayia spinosa[p] -- (spiny hopsage) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | 58/77 |
| 2010 | - | - | - | - | - | - | - | - | 55/72 |
| 2015 | - | - | - | - | - | - | - | - | 69/52 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | 21/27 |
| 2015 | 160 | - | 88 | 13 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 120 | - | 17 | 83 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2005 | 100 | - | 20 | 80 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 100 | - | 40 | 60 | 0 | 0 | 0 | 0 | - / - |
| 2015 | 80 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 120 | - | 0 | 100 | 0 | 0 | 0 | 17 | - / - |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 2005 | 40 | - | 0 | 100 | 0 | 0 | 50 | 0 | 23/32 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | 15/19 |
| 2015 | - | - | - | - | - | - | - | - | 6/9 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Linanthus pungens -- (granite prickly phlox) | | | | | | | | | |
| 2005 | 20 | - | 0 | 0 | 100 | 100 | 0 | 100 | - / - |
| 2010 | 20 | 20 | 0 | 100 | 0 | 0 | 0 | 0 | 9/15 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 13/17 |
| 2025 | 40 | - | 50 | 0 | 50 | 0 | 0 | 50 | - / - |
| Opuntia fragilis -- (brittle pricklypear) | | | | | | | | | |
| 2005 | 400 | - | 5 | 95 | 0 | 0 | 0 | 0 | 10/36 |
| 2010 | 380 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/38 |
| 2015 | 1160 | - | 0 | 98 | 2 | 5 | 0 | 2 | 10/41 |
| 2025 | 1040 | - | 2 | 90 | 8 | 0 | 0 | 8 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 2005 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 3/5 |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 9/11 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Yucca -- (yucca) | | | | | | | | | |
| 2005 | 80 | - | 100 | 0 | 0 | 0 | 0 | 0 | 26/39 |
| 2010 | 100 | - | 60 | 40 | 0 | 0 | 0 | 0 | 24/55 |
| 2015 | 140 | - | 0 | 100 | 0 | 0 | 0 | 0 | 12/36 |
| 2025 | 180 | - | 11 | 89 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

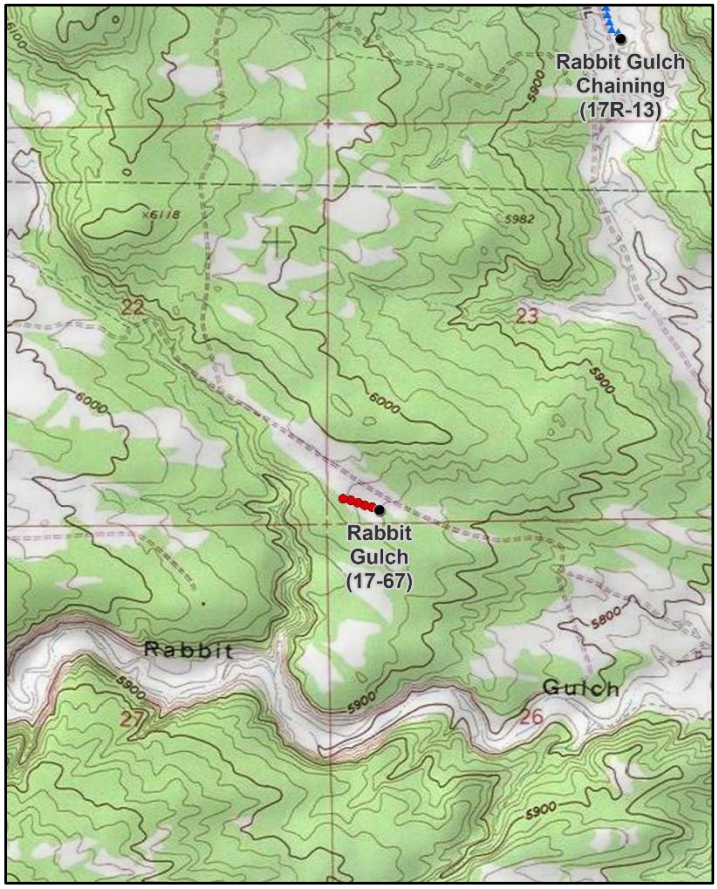
**Table 17-66.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

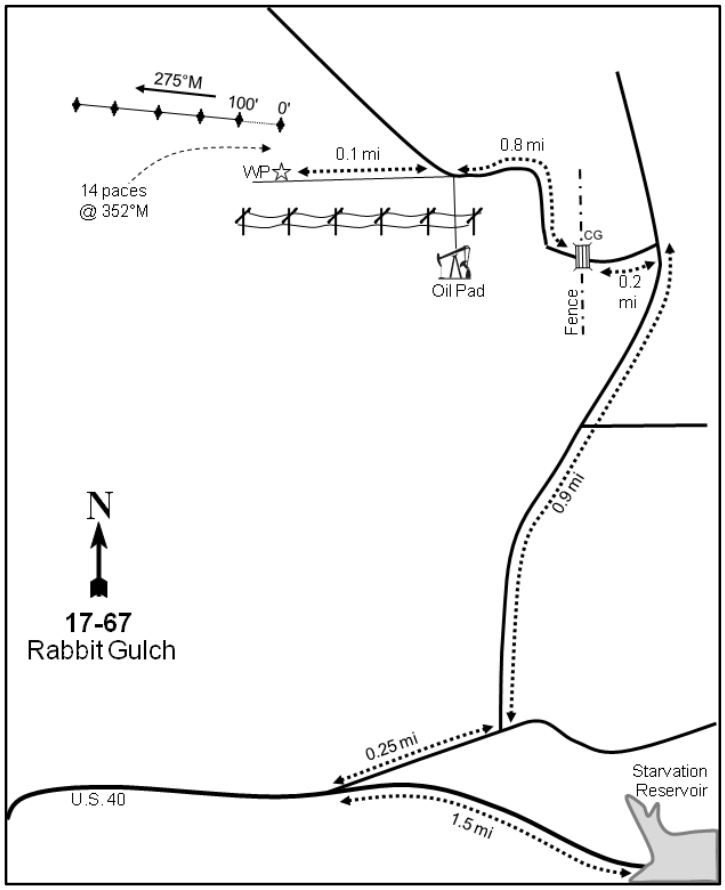
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2005 | 51 | - | 21 | 43 | 7 | 29 | 15.6 |
| 2010 | 47 | - | 31 | 54 | - | 15 | 14.6 |
| 2015 | 49 | - | 14 | 64 | 14 | 7 | 18.5 |
| 2025 | 44 | - | 7 | 64 | 14 | 14 | 20.0 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2005 | 12 | - | 75 | 25 | - | - | 3.3 |
| 2010 | 11 | 20 | 60 | 20 | - | - | 4.1 |
| 2015 | 12 | - | 86 | 14 | - | - | 4.6 |
| 2025 | 12 | - | 71 | 14 | 14 | - | 5.1 |

**Table 17-66.15 - Deer Desirable Components Index:** Upland Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | 6.0 | 0.0 | 0.0 | 30.0 | 0.0 | 1.1 | 0.0 | **37.1** | Poor |
| 2010 | 7.3 | 1.4 | 8.5 | 30.0 | 0.0 | 0.8 | 0.0 | **48.0** | Poor |
| 2015 | 7.3 | 2.7 | 6.5 | 30.0 | 0.0 | 0.4 | 0.0 | **46.9** | Poor |
| 2025 | 10.4 | 9.6 | 13.5 | 30.0 | 0.0 | 0.5 | 0.0 | **64.0** | Fair-Good |

# RABBIT GULCH - STUDY NO. 17-67




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Rabbit Gulch NE; Township 3S, Range 6W, Section 23 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 539370 East 4449884 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 94 |
| Transect Bearing | 280° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

Driving from the Starvation Bridge on U.S. 40, travel west for 1.5 miles to a turnoff (28000 West) on the north side of the road. Follow this road for 0.3 miles to a fork. Continue left and stay left for 0.9 miles. Continue 0.2 miles to a cattle guard and fence. After crossing the cattle guard, proceed 0.8 miles to a turnoff onto an oil pad. Turn left and immediately turn onto a two-track powerline road. Go 0.1 miles to a witness post on the right (north) side of the road. From the witness post walk 14 paces at 352 degrees magnetic to the 0-foot stake which is marked with browse tag #94.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 5,960ft (1,817m) |
| Aspect | East |
| Slope | 3% |
| Sample Dates | 07/10/1997, 09/12/2001, 06/21/2005, 06/30/2010, 06/17/2015, 07/29/2020, 07/14/2025 |

**Table 17-67.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Seeding - Seed Unknown | - | - | Historic | - |
| Hand Crew - Lop and Scatter | - | - | 2004 | 1250 |
| Hand Crew - Lop and Scatter | Rabbit Gulch Lop and Scatter | 5624 | June 2021 | 1507 |
| Chaining - Chain Unknown | - | - | Historic | - |

## Wildlife Habitat and Vegetation History

**Table 17-67.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 17-67.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 1997 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2001 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2005 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2010 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2015 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Perennial Grass/Wyoming Big Sagebrush | Early Phase I |
| 2025 | Wyoming Big Sagebrush/Perennial Grass | Early Phase I |

## Site Notes

Grazing is managed by the DWR on a Spring (April/May) rotation system to promote browse growth.

The big sagebrush on the site fluoresced as mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and was likely seeded although there is no record of it being seeded. Therefore, the sagebrush identification was left as Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*).

## Soils

**Table 17-67.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Sandy Loam | 8.0 | 78.6 | 10.8 | 10.6 | 0.6 | 5.1 | 96.0 | 0.4 | 07/10/1997 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 9 inches |
| NRCS Ecological Site | Semidesert Loam (Wyoming Big Sagebrush) |
| NRCS Ecological Site # | R034BY212UT |
| States and Transitions | 1997-2001 - Current Potential State: Community Phase 2.1<br>2005-2025 - Current Potential State: Community Phase 2.5 |

Since study establishment in 1997, the plant community on this site has been dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with a herbaceous understory mainly comprised of perennial grasses (Table 17-67.7, Table 17-67.12). The introduced species crested wheatgrass (*Agropyron cristatum*) and native species needle and thread (*Hesperostipa comata*) have provided much of the perennial grass cover throughout the study period (Table 17-67.10). Although they have been diverse, forbs have remained scarce (Table 17-67.11). Utah juniper (*Juniperus osteosperma*) was scattered throughout the site with low density, but many of the trees were removed during a lop and scatter treatment that took place between 2004 and 2007 (Photos, Table 17-67.1, Table 17-67.12, Table 17-67.13). Twoneedle pinyon (*Pinus edulis*) and juniper density increased between 2020 and 2025 despite an additional lop and scatter treatment in 2021 (Table 17-67.1, Table 17-67.14). However, the site has been considered to be within Early Phase I of woodland succession throughout the duration of the study (Table 17-67.4), suggesting that infilling is likely not an immediate concern. Nearly half of the sagebrush population was found to have poor vigor in the two most recent sample years, and density has exhibited an overall decrease since study establishment. These trends could indicate a compositional shift in the plant community should they continue in the future (Table 17-67.13).

Deer winter range condition on this site has fluctuated between poor-fair and good since 1997; the study site was considered to be in fair condition in 2025. Improvement to deer winter range could be accomplished through efforts that reintroduce preferred browse species to the site. Diversifying and increasing the native perennial forb populations would also improve winter range conditions (Table 17-67.11, Table 17-67.12, Table 17-67.15). The sagebrush component of this site could provide valuable browse for elk and deer during the winter months (Table 17-67.3). Pellet transect data indicates that elk and deer presence has ranged between low and high over the sample years; deer had a notably high presence in 2025 (Table 17-67.9). In addition, collared mule deer had frequent

occurrences in the area during the winter and early spring of 2025 (Wildlife Migration Initiative). Sagebrush utilization has remained high over the course of the study, with over 70% of plants sampled in density strips showing signs of moderate to heavy browsing in most study years. Sustained heavy utilization combined with other factors (climatic, etc.) have likely contributed to the poor vigor and overall decrease in density observed within the sagebrush population on this site (Table 17-67.13).

## Trend Summary Tables

**Table 17-67.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 1997 | 4.3 | 1.1 | 1.0 | - | - | - |
| 2001 | 4.4 | 2.9 | 0.8 | - | - | - |
| 2005 | 2.6 | 2.0 | - | 4.1 | 1.8 | - |
| 2010 | 2.9 | 1.2 | - | 3.7 | 1.4 | - |
| 2015 | 4.4 | 1.4 | - | 5.7 | 1.0 | - |
| 2020 | 3.4 | 1.8 | - | 2.6 | 2.1 | - |
| 2025 | 4.1 | 2.6 | - | 4.4 | 2.3 | - |

**Table 17-67.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 1997 | 127 | 376 | 14 | 14 | 0.6 | 10.7 | 0.0 | 0.0 |
| 2001 | 44 | 377 | 45 | 16 | 0.1 | 25.4 | 1.0 | 0.1 |
| 2005 | 192 | 367 | 139 | 43 | 2.4 | 22.2 | 1.8 | 0.9 |
| 2010 | 1 | 362 | 11 | 17 | 0.0 | 24.5 | 0.1 | 0.4 |
| 2015 | 15 | 366 | 44 | 25 | 0.2 | 33.7 | 0.3 | 0.3 |
| 2020 | 26 | 326 | - | 10 | 0.1 | 22.2 | - | 0.2 |
| 2025 | 9 | 369 | 11 | 10 | 0.1 | 27.9 | 0.0 | 0.1 |

**Table 17-67.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 1997 | 47.0 | 5.8 | 23.6 | 0.1 | 0.0 | 14.8 |
| 2001 | 48.6 | 0.9 | 27.3 | - | - | 33.3 |
| 2005 | 54.4 | 0.7 | 24.6 | 0.2 | - | 28.7 |
| 2010 | 44.3 | 0.2 | 37.0 | - | - | 32.1 |
| 2015 | 53.3 | 1.0 | 27.7 | 0.1 | 0.0 | 40.6 |
| 2020 | 55.8 | 2.0 | 39.6 | 0.1 | 0.5 | 24.5 |
| 2025 | 43.8 | 0.3 | 32.5 | 0.1 | 0.0 | 36.4 |

**Table 17-67.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 1997 | 3 | 72 | 3 | 16 |
| 2001 | 1 | 85 | 22 | 31 |
| 2005 | 5 | 53 | 10 | 42 |
| 2010 | 6 | 49 | 8 | 24 |
| 2015 | - | 13 | 1 | 22 |
| 2020 | 4 | 52 | 26 | 18 |
| 2025 | 4 | 65 | 22 | 32 |
| Year | Days Use Per Acre (ha) | | | |
| 1997 | - | - | - | - |
| 2001 | 2.2 (5.4) | 172.9 (427.1) | 26.2 (64.6) | - |
| 2005 | 12.3 (30.5) | 93.2 (230.1) | 17.4 (43.0) | - |
| 2010 | 4.4 (10.8) | 63.7 (157.3) | 42.2 (104.3) | - |
| 2015 | - | 11.4 (28.1) | 2.0 (5.0) | - |
| 2020 | 4.4 (10.8) | 93.2 (230.1) | 24.8 (61.2) | - |
| 2025 | 1.5 (3.6) | 150.1 (370.8) | 13.4 (33.1) | - |

**Table 17-67.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bouteloua gracilis (blue grama) | Bromus tectorum[ai] (cheatgrass) | Elymus lanceolatus (thickspike wheatgrass) | Hesperostipa comata (needle and thread) | Pleuraphis jamesii (James' galleta) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Vulpia octoflora[a] (sixweeks fescue) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | |
| 1997 | 13 | 347 | 71 | 0 | 22 | 76 | - | - | - | 3 | 127 |
| 2001 | 15 | 312 | 141 | - | 1 | 75 | - | - | - | 22 | 44 |
| 2005 | 15 | 153 | 58 | - | - | 295 | 8 | - | - | 10 | 192 |
| 2010 | 13 | 230 | 54 | - | - | 229 | 8 | 1 | 3 | 11 | 1 |
| 2015 | 23 | 285 | 78 | - | - | 123 | 10 | - | - | 17 | 15 |
| 2020 | 6 | 227 | 93 | - | 4 | 102 | 15 | - | 2 | 26 | 26 |
| 2025 | 9 | 263 | 135 | - | - | 139 | 5 | - | 2 | 8 | 9 |
| year | Average Cover (%) | | | | | | | | | | |
| 1997 | 0.2 | 8.4 | 0.8 | 0.0 | 0.2 | 1.0 | - | - | - | 0.0 | 0.6 |
| 2001 | 0.3 | 15.2 | 6.0 | - | 0.0 | 3.5 | - | - | - | 0.4 | 0.1 |
| 2005 | 0.3 | 3.4 | 1.3 | - | - | 16.9 | 0.2 | - | - | 0.2 | 2.4 |
| 2010 | 0.3 | 8.3 | 1.6 | - | - | 13.7 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 |
| 2015 | 1.1 | 21.6 | 2.8 | - | - | 6.8 | 0.7 | - | - | 0.7 | 0.2 |
| 2020 | 0.1 | 12.7 | 5.0 | - | 0.0 | 3.0 | 0.4 | - | 0.0 | 1.0 | 0.1 |
| 2025 | 0.0 | 13.7 | 7.3 | - | - | 6.5 | 0.2 | - | 0.0 | 0.3 | 0.1 |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-67.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Alyssum desertorum[ai] (desert madwort) | Chenopodium fremontii[a] (Fremont's goosefoot) | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Collinsia parviflora[a] (maiden blue eyed Mary) | Collomia linearis[a] (tiny trumpet) | Crepis acuminata (tapertip hawksbeard) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Draba[a] (draba) | Eriogonum cernuum[a] (nodding buckwheat) | Gilia inconspicua[a] (shy gilia) | Hymenopappus filifolius (fineleaf hymenopappus) | Lappula occidentalis[a] (flatspine stickseed) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Oenothera (evening primrose) | Phlox longifolia (longleaf phlox) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 1997 | 4 | 2 | - | - | 3 | - | 3 | - | - | 5 | - | - | - | - | 1 | - | - |
| 2001 | - | 2 | - | 6 | - | - | - | 6 | - | 6 | - | 4 | 33 | - | - | - | 6 |
| 2005 | 2 | 21 | 27 | 12 | - | - | - | 43 | 1 | - | 2 | 9 | 91 | - | 1 | - | - |
| 2010 | - | 1 | - | 1 | - | 2 | - | 4 | - | 1 | - | - | 4 | - | - | - | - |
| 2015 | - | - | - | - | - | - | - | 23 | - | - | - | 2 | 28 | - | - | 8 | - |
| 2020 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 | - | 0 | - |
| 2025 | - | - | - | - | - | - | - | 3 | - | - | - | 1 | 1 | - | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 1997 | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | - | - | 0.0 | - | - | - | - | 0.0 | - | - |
| 2001 | - | 0.0 | - | 0.0 | - | - | - | 0.4 | - | 0.0 | - | 0.1 | 0.5 | - | - | - | 0.0 |
| 2005 | 0.0 | 0.3 | 0.2 | 0.1 | - | - | - | 0.3 | 0.0 | - | 0.0 | 0.2 | 0.9 | - | 0.0 | - | - |
| 2010 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.0 | - | - | 0.1 | - | - | - | - |
| 2015 | - | - | - | - | - | - | - | 0.2 | - | - | - | 0.0 | 0.1 | - | - | 0.1 | - |
| 2020 | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | 0.0 | - | 0.0 | - |
| 2025 | - | - | - | - | - | - | - | 0.0 | - | - | - | 0.0 | 0.0 | - | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Plantago patagonica[a] (woolly plantain) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Townsendia incana (hoary Townsend daisy) |
|---|---|---|---|---|
| year | Nested Frequency | | | |
| 1997 | - | - | 4 | 6 |
| 2001 | - | - | 6 | - |
| 2005 | 3 | - | 23 | 14 |
| 2010 | - | 1 | 14 | 1 |
| 2015 | 3 | - | 15 | - |
| 2020 | - | 3 | 5 | 1 |
| 2025 | 10 | - | 9 | - |
| year | Average Cover (%) | | | |
| 1997 | - | - | 0.0 | 0.0 |
| 2001 | - | - | 0.0 | - |
| 2005 | 0.0 | - | 0.4 | 0.3 |
| 2010 | - | 0.0 | 0.3 | 0.0 |
| 2015 | 0.0 | - | 0.2 | - |
| 2020 | - | 0.0 | 0.1 | 0.0 |
| 2025 | 0.0 | - | 0.1 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-67.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia tridentata ssp. wyomingensis[p] (Wyoming big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Atriplex confertifolia[p] (shadscale saltbush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Ericameria nauseosa ssp. consimilis var. oreophila (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Opuntia polyacantha (plains pricklypear) | Sclerocactus (fishhook cactus) |
|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | - |
| 2001 | - | - | - | - | - | - | - | - | - |
| 2005 | 3.8 | - | 0.3 | 0.2 | - | 0.9 | - | 0.6 | 0.1 |
| 2010 | 3.7 | - | 0 | - | - | 0.8 | - | 0.6 | - |
| 2015 | 5.3 | 0.1 | 0.3 | 0.5 | - | 0.1 | - | 0.4 | - |
| 2020 | 1.8 | 0.6 | 0.2 | 0.6 | - | 0.5 | - | 1 | - |
| 2025 | 2.7 | 1.4 | 0.3 | 0.6 | - | 0.7 | - | 1 | - |
| year | Quadrat Cover (%) | | | | | | | | |
| 1997 | 4.3 | - | - | 0.6 | - | 0.2 | 1.0 | 0.3 | 0.0 |
| 2001 | 4.4 | - | 0.0 | 0.8 | 0.6 | 1.0 | 0.8 | 0.4 | 0.1 |
| 2005 | 2.4 | - | 0.1 | 0.5 | - | 0.6 | - | 0.8 | 0.0 |
| 2010 | 2.6 | 0.1 | 0.1 | 0.0 | 0.1 | 0.3 | - | 0.8 | - |
| 2015 | 3.8 | 0.5 | 0.1 | 0.0 | 0.6 | 0.2 | - | 0.7 | - |
| 2020 | 2.8 | 0.4 | 0.1 | 0.6 | - | 0.5 | - | 0.7 | - |
| 2025 | 3.2 | 0.9 | 0.0 | 0.9 | - | 0.3 | - | 1.4 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-67.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. wyomingensis[P] -- (Wyoming big sagebrush) | | | | | | | | | |
| 1997 | 3060 | 60 | 28 | 61 | 11 | 63 | 22 | 43 | 44/70 |
| 2001 | 3080 | - | 7 | 66 | 27 | 37 | 42 | 20 | 34/57 |
| 2005 | 1840 | 2980 | 1 | 53 | 46 | 29 | 63 | 36 | 44/61 |
| 2010 | 1800 | - | 6 | 77 | 18 | 11 | 47 | 13 | 36/60 |
| 2015 | 1740 | 20 | 10 | 75 | 15 | 28 | 64 | 15 | 39/67 |
| 2020 | 1160 | 360 | 5 | 52 | 43 | 21 | 60 | 47 | 37/63 |
| 2025 | 1340 | - | 13 | 42 | 45 | 9 | 70 | 45 | - / - |
| Atriplex canescens[P] -- (fourwing saltbush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2001 | - | - | - | - | - | - | - | - | 110/157 |
| 2005 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | 62/85 |
| 2010 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | 85/115 |
| 2015 | 40 | - | 0 | 100 | 0 | 100 | 0 | 0 | 71/94 |
| 2020 | 40 | - | 0 | 50 | 50 | 0 | 0 | 0 | 80/124 |
| 2025 | 60 | - | 0 | 100 | 0 | 0 | 100 | 0 | - / - |
| Atriplex confertifolia[P] -- (shadscale saltbush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2001 | 20 | - | 0 | 0 | 100 | 0 | 0 | 0 | 35/82 |
| 2005 | 60 | - | 0 | 100 | 0 | 0 | 0 | 0 | 55/102 |
| 2010 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | 41/101 |
| 2015 | 60 | - | 0 | 100 | 0 | 33 | 0 | 0 | 37/77 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 67/108 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 1997 | 560 | - | 39 | 61 | 0 | 11 | 0 | 4 | 37/60 |
| 2001 | 400 | - | 15 | 75 | 10 | 0 | 0 | 40 | 26/44 |
| 2005 | 100 | - | 0 | 100 | 0 | 0 | 0 | 0 | 39/54 |
| 2010 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | 27/41 |
| 2015 | 120 | - | 0 | 100 | 0 | 0 | 0 | 17 | 42/60 |
| 2020 | 80 | - | 0 | 75 | 25 | 0 | 50 | 0 | 36/54 |
| 2025 | 100 | - | 0 | 80 | 20 | 0 | 20 | 20 | - / - |
| Eriogonum microthecum[P] -- (slender buckwheat) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2001 | 40 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa ssp. consimilis var. oreophila -- (rubber rabbitbrush) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2001 | 40 | - | 0 | 50 | 50 | 0 | 0 | 50 | 29/26 |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | 29/28 |
| 2015 | - | - | - | - | - | - | - | - | 54/63 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 1997 | 980 | 80 | 12 | 88 | 0 | 0 | 0 | 0 | 19/21 |
| 2001 | 1280 | - | 0 | 94 | 6 | 0 | 0 | 6 | 14/19 |
| 2005 | 1660 | - | 0 | 100 | 0 | 0 | 0 | 0 | 21/28 |
| 2010 | 740 | - | 11 | 87 | 3 | 0 | 0 | 3 | 17/26 |
| 2015 | 500 | 400 | 20 | 80 | 0 | 24 | 0 | 8 | 17/20 |
| 2020 | 500 | - | 12 | 88 | 0 | 0 | 0 | 0 | 16/26 |
| 2025 | 1140 | - | 25 | 75 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 1997 | 20 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2001 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2005 | - | - | - | - | - | - | - | - | - / - |
| 2010 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2015 | - | - | - | - | - | - | - | - | - / - |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Krascheninnikovia lanata[p] -- (winterfat) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 100 | 0 | 0 | 19/18 |
| 2001 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | 36/26 |
| 2005 | - | - | - | - | - | - | - | - | 58/66 |
| 2010 | - | - | - | - | - | - | - | - | 38/46 |
| 2015 | - | - | - | - | - | - | - | - | 32/46 |
| 2020 | - | - | - | - | - | - | - | - | 31/40 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Opuntia polyacantha -- (plains pricklypear) | | | | | | | | | |
| 1997 | 560 | - | 11 | 86 | 4 | 0 | 0 | 4 | 13/31 |
| 2001 | 620 | 40 | 13 | 81 | 7 | 0 | 0 | 3 | 8/31 |
| 2005 | 620 | - | 7 | 87 | 7 | 0 | 0 | 0 | 15/50 |
| 2010 | 860 | 120 | 16 | 84 | 0 | 5 | 0 | 0 | 14/50 |
| 2015 | 1020 | 60 | 14 | 86 | 0 | 2 | 0 | 8 | 15/38 |
| 2020 | 1300 | - | 2 | 97 | 2 | 0 | 0 | 3 | 11/32 |
| 2025 | 1820 | - | 8 | 86 | 7 | 0 | 0 | 7 | - / - |
| Pediocactus simpsonii -- (mountain ball cactus) | | | | | | | | | |
| 1997 | - | - | - | - | - | - | - | - | -/- |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 5/7 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sclerocactus -- (fishhook cactus) | | | | | | | | | |
| 1997 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2001 | 40 | - | 50 | 50 | 0 | 0 | 0 | 0 | - / - |
| 2005 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 11/9 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | - | - | - | - | - | - | - | - | 11/11 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

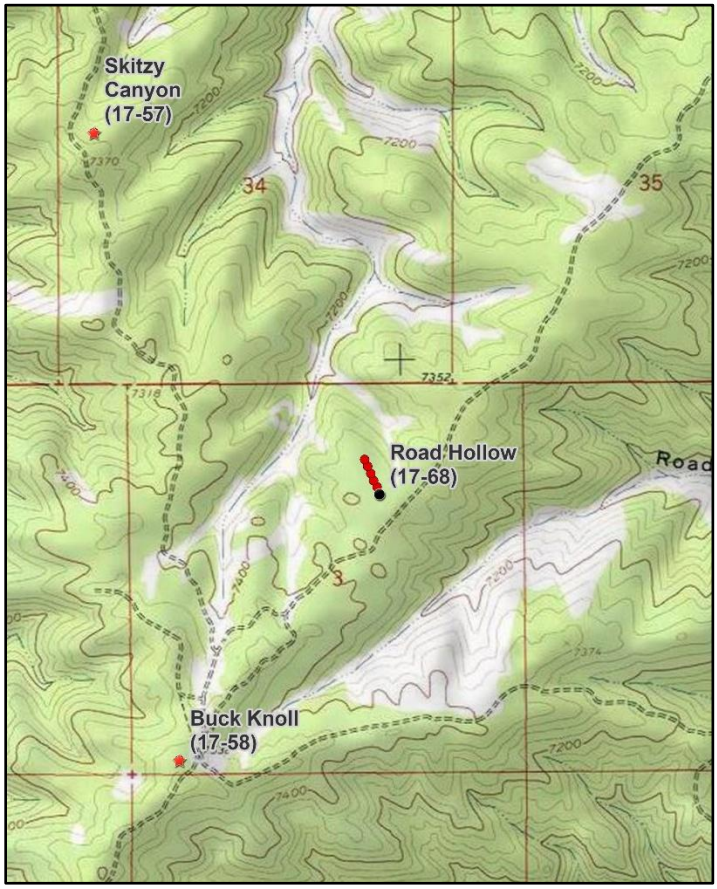
**Table 17-67.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

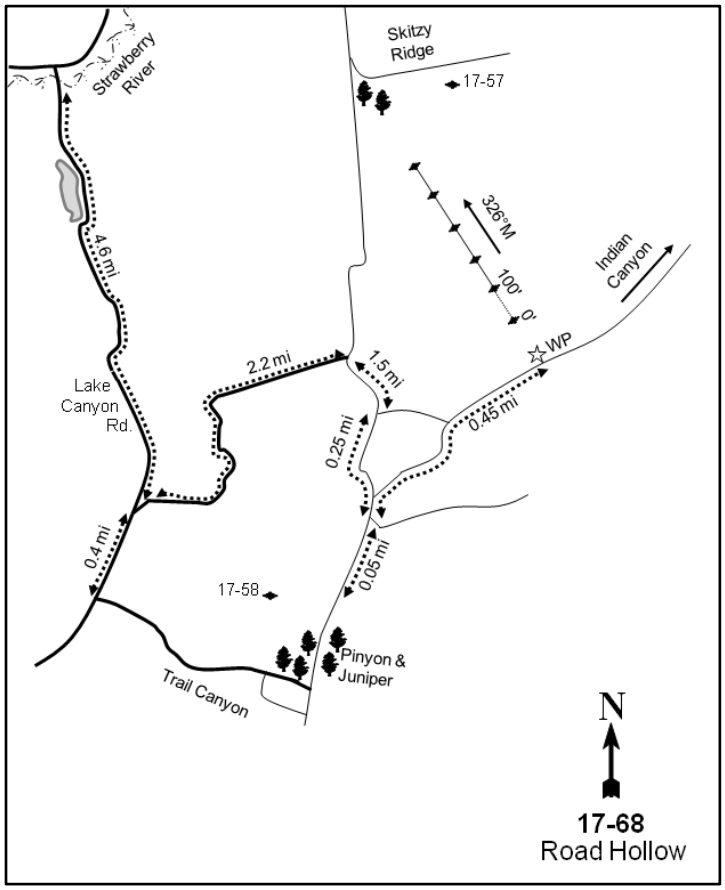
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 14 | 13 | 75 | 13 | - | - | 3.4 |
| 2020 | 14 | - | 50 | 50 | - | - | 14.4 |
| 2025 | 21 | 50 | 50 | - | - | - | 2.5 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 2 | - | 100 | - | - | - | 3.0 |
| 2020 | 1 | - | - | 100 | - | - | 7.0 |
| 2025 | 2 | - | 100 | - | - | - | 3.0 |

**Table 17-67.15 - Deer Desirable Components Index:** Semidesert Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 1997 | 5.4 | 0.0 | 0.0 | 21.4 | -0.5 | 0.1 | 0.0 | **26.4** | Poor-Fair |
| 2001 | 5.5 | 0.0 | 0.0 | 30.0 | -0.1 | 0.2 | 0.0 | **35.6** | Fair |
| 2005 | 5.1 | 0.0 | 0.0 | 30.0 | -1.8 | 1.8 | 0.0 | **35.1** | Fair |
| 2010 | 4.6 | 0.0 | 0.0 | 30.0 | 0.0 | 0.8 | 0.0 | **35.4** | Fair |
| 2015 | 7.1 | 10.9 | 4.8 | 30.0 | -0.1 | 0.7 | 0.0 | **53.4** | Good |
| 2020 | 3.2 | 0.0 | 0.0 | 30.0 | -0.1 | 0.4 | 0.0 | **33.5** | Fair |
| 2025 | 5.4 | 0.0 | 0.0 | 30.0 | 0.0 | 0.2 | 0.0 | **35.6** | Fair |

# ROAD HOLLOW - STUDY NO. 17-68




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Buck Knoll NE; Township 5S, Range 6W, Section 03 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 538934 East 4436582 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 595 |
| Transect Bearing | 326° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Strawberry River, take Lake Canyon Road (3239 West) south for 4.6 miles to a road which goes up the side canyon to the east. Turn left and go up the side canyon and switchbacks for 2.2 miles to an intersection at the top of the ridge. Turn right and drive south 1.5 miles to an intersection. Turn right and go 0.3 miles to a fork. Turn left (this is a hairpin turn) and continue for 0.5 miles. The site is on the left (northwest) side of the road and the 0-foot baseline stake is marked with browse tag #595.

## Site Information

| | |
|---|---|
| Land Ownership | State |
| Land Administrator | UDWR |
| Allotment | No data |
| Elevation | 7,400ft (2,256m) |
| Aspect | North |
| Slope | 1-3% |
| Sample Dates | 06/18/2015, 07/29/2020, 07/30/2025 |

**Table 17-68.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Hand Crew - Lop and Scatter | Skitzy Lop and Scatter | 1729 | Fall 2010 | 392 |

## Wildlife Habitat and Vegetation History

**Table 17-68.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | winter |
| Rocky Mountain Elk | crucial | winter |

**Table 17-68.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2015 | Black Sagebrush/Perennial Grass | Early Phase I |
| 2020 | Black Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Perennial Grass/Black Sagebrush | Early Phase I |

## Site Notes

This study was established in the Skitzy Wildlife Management Area (WMA) to replace the Buck Knoll (17-58) and Skitzy Canyon (17-57) sites that are now partially covered by oil/gas pads.

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 15 inches |
| NRCS Ecological Site | Mountain Shallow Loam (Black Sagebrush) |
| NRCS Ecological Site # | R048AY433UT |
| States and Transitions | 2015-2025 - Current Potential: Community Phase Undefined |

Since study establishment in 2015, the plant community on this site has been dominated by black sagebrush (*Artemisia nova*) with an abundant herbaceous understory (Table 17-68.7, Table 17-68.12). The introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) has comprised most of the herbaceous component and has been stable in both cover and frequency (Table 17-68.10). The forb layer has remained moderately diverse, but it has lacked in abundance (Table 17-68.11). Cover and density of Utah juniper (*Juniperus osteosperma*) and twoneedle pinyon (*Pinus edulis*) have remained similar over time (Table 17-68.12, Table 17-68.13). Pinyon and juniper could encroach in the future without continued treatments. However, the site has been considered to be within Early Phase I of woodland succession since 2015 (Table 17-68.4), indicating that this may not be an immediate concern.

Deer winter range condition on this site has fluctuated between fair and good-excellent since 2015; the study site was considered to be in fair condition in 2025. Improvement to deer winter range could be accomplished through efforts that increase preferred browse recruitment and age class diversification in the population. Diversifying and increasing the native perennial forb populations would also improve winter range conditions (Table 17-68.11, Table 17-68.12, Table 17-68.13). The sagebrush component of this site could provide valuable browse for elk and deer during the winter months (Table 17-68.3). However, pellet transect data indicates that elk and deer presence has been low over the course of the study (Table 17-68.9). Utilization of black sagebrush has generally been light to moderate and was at its highest during the most recent sample year. More specifically, 49% of black sagebrush plants sampled in density strips were moderately to heavily hedged in 2025 (Table 17-68.13).

## Trend Summary Tables

**Table 17-68.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2015 | 13.5 | 0.2 | 0.4 | 19.6 | 0.1 | 0.3 |
| 2020 | 18.8 | 0.3 | 0.7 | 22.9 | 0.6 | - |
| 2025 | 9.0 | 0.2 | 0.6 | 11.8 | - | 0.3 |

**Table 17-68.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2015 | - | 337 | 25 | 85 | - | 23.1 | 0.1 | 2.1 |
| 2020 | - | 301 | - | 53 | - | 19.4 | - | 1.7 |
| 2025 | - | 321 | 2 | 49 | - | 21.7 | 0.0 | 1.0 |

**Table 17-68.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2015 | 8.7 | 1.1 | 39.7 | 32.2 | 5.1 | 38.2 |
| 2020 | 11.2 | 2.7 | 42.1 | 27.1 | 4.5 | 39.1 |
| 2025 | 8.6 | 0.7 | 36.1 | 29.3 | 5.0 | 33.7 |

**Table 17-68.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Mule Deer | Rocky Mountain Elk | Horse | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2015 | 3 | 9 | - | 6 |
| 2020 | 9 | 8 | - | 3 |
| 2025 | 25 | 14 | - | 6 |
| Year | Days Use Per Acre (ha) | | | |
| 2015 | 3.4 (8.3) | 15.4 (38.1) | - | - |
| 2020 | 18.1 (44.7) | 25.5 (62.9) | 0.6 (1.4) | - |
| 2025 | 18.1 (44.7) | 26.2 (64.6) | 0.6 (1.4) | - |

**Table 17-68.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Agropyron cristatum[i] (crested wheatgrass) | Bromus inermis[i] (smooth brome) | Elymus elymoides (squirreltail) | Elymus trachycaulus (slender wheatgrass) | Festuca idahoensis (Idaho fescue) | Leymus cinereus (basin wildrye) | Poa fendleriana (muttongrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | |
| 2015 | 7 | 218 | 2 | 11 | 24 | 1 | 4 | 26 | 150 | 74 | - | 5 |
| 2020 | 1 | 228 | - | - | - | 3 | - | 11 | 99 | 57 | - | - |
| 2025 | 18 | 230 | - | - | 8 | 7 | - | 5 | 90 | 59 | 23 | - |
| year | Average Cover (%) | | | | | | | | | | | |
| 2015 | 0.1 | 13.0 | 0.0 | 0.1 | 2.0 | 0.1 | 0.0 | 0.3 | 2.8 | 4.3 | - | 0.2 |
| 2020 | 0.0 | 13.8 | - | - | - | 0.0 | - | 0.1 | 1.4 | 4.0 | - | - |
| 2025 | 0.9 | 14.8 | - | - | 0.0 | 0.1 | - | 0.0 | 0.7 | 3.7 | 1.5 | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17-68.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Arabis (rockcress) | Arenaria fendleri (Fendler's sandwort) | Astragalus chamaeleuce var. chamaeleuce (cicada milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus lentiginosus (freckled milkvetch) | Cryptantha (cryptantha) | Descurainia pinnata[a] (western tansymustard) | Eriogonum alatum (winged buckwheat) | Hedysarum boreale (Utah sweetvetch) | Packera cana (woolly groundsel) | Penstemon caespitosus (mat penstemon) | Petradoria pumila (rock goldenrod) | Phlox hoodii (spiny phlox) | Stenotus acaulis (stemless mock goldenweed) | Tetraneuris acaulis (stemless four-nerve daisy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 2015 | 19 | 11 | 9 | 41 | 2 | - | 2 | 6 | 0 | 9 | 3 | 4 | 3 | 8 | 7 | 7 |
| 2020 | - | 5 | - | 1 | 0 | 7 | - | - | 1 | 6 | - | 2 | 5 | 27 | 6 | 3 |
| 2025 | 2 | - | 13 | 2 | - | 17 | - | - | - | 2 | - | - | 4 | 25 | 5 | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 2015 | 0.1 | 0.1 | 0.0 | 1.1 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 |
| 2020 | - | 0.0 | - | 0.0 | 0.0 | 0.3 | - | - | 0.0 | 0.5 | - | 0.0 | 0.1 | 0.5 | 0.3 | 0.0 |
| 2025 | 0.0 | - | 0.1 | 0.0 | - | 0.3 | - | - | - | 0.0 | - | - | 0.0 | 0.2 | 0.3 | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17-68.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Artemisia nova[p] (black sagebrush) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Ericameria nauseosa ssp. consimilis var. oreophila (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. hololeuca[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Juniperus osteosperma[t] (Utah juniper) | Pinus edulis[t] (twoneedle pinyon) | Sambucus[p] (elderberry) |
|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | |
| 2015 | 19.1 | 0.4 | 0.1 | - | - | 0.2 | 0.1 | 0.1 |
| 2020 | 22.5 | 0.4 | 0.4 | - | 0.2 | - | - | - |
| 2025 | 11.7 | - | - | 0.1 | - | - | 0.3 | - |
| year | Quadrat Cover (%) | | | | | | | |
| 2015 | 13.5 | 0.0 | 0.2 | - | 0.0 | 0.4 | 0.0 | 0.0 |
| 2020 | 18.8 | 0.0 | 0.1 | - | 0.2 | 0.7 | - | - |
| 2025 | 8.6 | - | 0.0 | 0.4 | 0.1 | 0.6 | 0.0 | - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17-68.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia frigida[p] -- (prairie sagewort) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 11/26 |
| 2020 | - | - | - | - | - | - | - | - | 17/19 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia nova[p] -- (black sagebrush) | | | | | | | | | |
| 2015 | 10080 | 3060 | 36 | 62 | 2 | 12 | 16 | 2 | 28/62 |
| 2020 | 11780 | 860 | 43 | 52 | 5 | 8 | 11 | 4 | 29/55 |
| 2025 | 7600 | 860 | 6 | 78 | 16 | 31 | 18 | 16 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2015 | 300 | 80 | 53 | 40 | 7 | 13 | 67 | 7 | 49/85 |
| 2020 | 40 | - | 50 | 50 | 0 | 100 | 0 | 0 | 56/101 |
| 2025 | 60 | - | 33 | 67 | 0 | 0 | 33 | 0 | - / - |
| Atriplex canescens[p] -- (fourwing saltbush) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 112/251 |
| 2020 | - | - | - | - | - | - | - | - | 76/84 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Cercocarpus montanus[p] -- (alderleaf mountain mahogany) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 98/151 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 12/19 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 29/46 |
| 2020 | - | - | - | - | - | - | - | - | 30/48 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Ericameria nauseosa ssp. nauseosa var. hololeuca[p] -- (rubber rabbitbrush) | | | | | | | | | |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | 92/102 |
| 2020 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 93/103 |
| 2025 | 60 | - | 0 | 33 | 67 | 0 | 33 | 67 | - / - |
| Ericameria nauseosa ssp. consimilis var. oreophila -- (rubber rabbitbrush) | | | | | | | | | |
| 2015 | 100 | - | 20 | 80 | 0 | 0 | 60 | 0 | 70/72 |
| 2020 | 60 | - | 0 | 33 | 67 | 33 | 33 | 67 | 66/67 |
| 2025 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 23/32 |
| 2020 | 120 | - | 50 | 50 | 0 | 0 | 0 | 0 | 16/24 |
| 2025 | 80 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| Juniperus osteosperma[t] -- (Utah juniper) | | | | | | | | | |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 60 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2025 | 60 | - | 33 | 67 | 0 | 0 | 0 | 0 | - / - |
| Pinus edulis[t] -- (twoneedle pinyon) | | | | | | | | | |
| 2015 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| 2020 | 40 | 20 | 100 | 0 | 0 | 0 | 0 | 50 | - / - |
| 2025 | 40 | - | 100 | 0 | 0 | 0 | 0 | 0 | - / - |
| Purshia tridentata[p] -- (antelope bitterbrush) | | | | | | | | | |
| 2015 | - | - | - | - | - | - | - | - | 73/116 |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Sambucus[p] -- (elderberry) | | | | | | | | | |
| 2015 | 20 | - | 0 | 0 | 100 | 0 | 0 | 100 | 66/93 |
| 2020 | - | - | - | - | - | - | - | - | 56/98 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

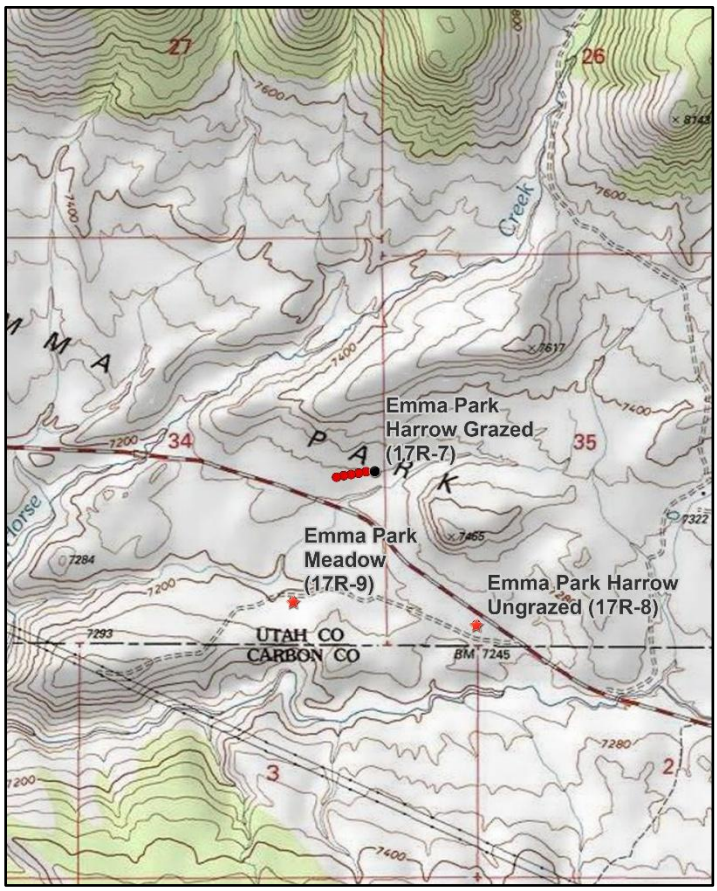
**Table 17-68.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

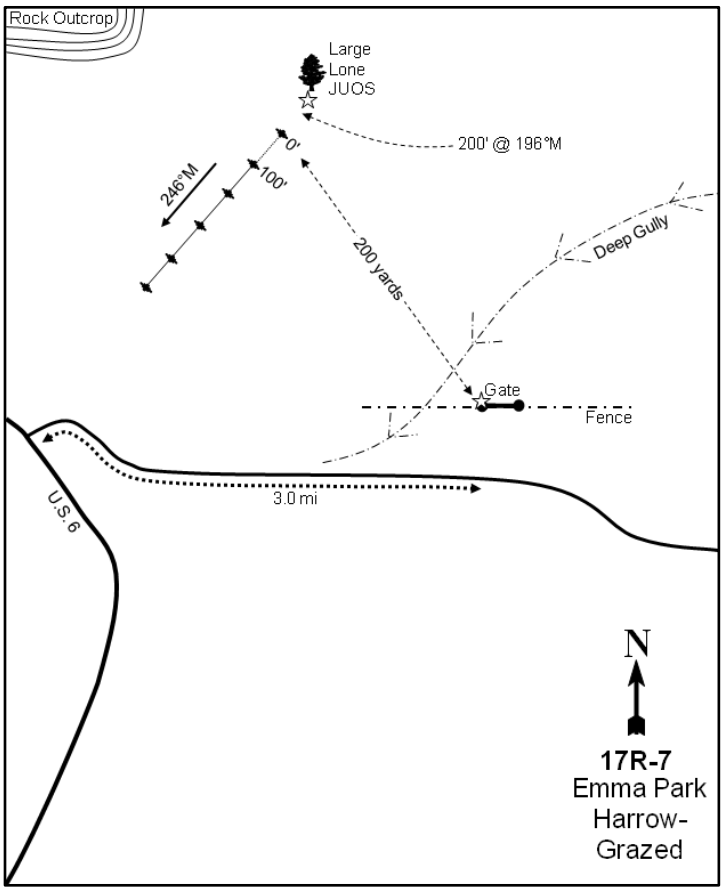
| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus osteosperma (Utah juniper) | | | | | | | |
| 2015 | 43 | - | 100 | - | - | - | 4.0 |
| 2020 | 44 | - | 75 | 25 | - | - | 5.0 |
| 2025 | 42 | - | 54 | 46 | - | - | 11.8 |
| Pinus edulis (twoneedle pinyon) | | | | | | | |
| 2015 | 7 | 33 | 67 | - | - | - | 4.0 |
| 2020 | 8 | - | 67 | 33 | - | - | 4.3 |
| 2025 | 9 | 13 | 63 | 25 | - | - | 6.1 |

**Table 17-68.15 - Deer Desirable Components Index:** Mountain Potential Scale.

| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | **Total Score** | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| 2015 | 24.5 | 14.2 | 15.0 | 30.0 | 0.0 | 4.2 | 0.0 | **87.9** | Good |
| 2020 | 28.6 | 13.6 | 15.0 | 30.0 | 0.0 | 3.5 | 0.0 | **90.7** | Good-Excellent |
| 2025 | 14.8 | 10.3 | 3.1 | 30.0 | 0.0 | 2.1 | 0.0 | **60.3** | Fair |

# EMMA PARK HARROW GRAZED - STUDY NO. 17R-7




## Location Information

| | |
|---|---|
| USGS 7.5 min Map Info | Kyune NE; Township 11S, Range 9E, Section 34 |
| GPS (0' Stake) | NAD 83 UTM ZONE 12, 508917 East 4407739 North |

## Transect Information

| | |
|---|---|
| Browse Tag # (0' Stake) | 422 |
| Transect Bearing | 246° magnetic |
| Length | 500ft |
| Belt Placement | Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft) |
| Belt Marker Placement | Standard |

## Directions to Site

From the Kyune turnoff on U.S. 6, travel 3.0 miles to a gate on the north side of the road. From the gate, walk approximately 200 yards towards a lone, large juniper tree on the other side of the deep gully. The 0-foot post is about 200 feet south of the juniper and is marked by browse tag #422.

## Site Information

| | |
|---|---|
| Land Ownership | Federal |
| Land Administrator | BLM |
| Allotment | KYUNE I |
| Elevation | 7,270ft (2,216m) |
| Aspect | South |
| Slope | 5% |
| Sample Dates | 09/05/2001, 08/23/2005, 07/08/2010, 06/18/2015, 07/27/2020, 07/21/2025 |

**Table 17R-07.1 Disturbance History.** Recorded history of major disturbances.

| Treatment/Disturbance | Name | WRI DB# | Date | Size (acres) |
|---|---|---|---|---|
| Harrow - One-Way Dixie | - | - | 2000 | - |
| Seeding - Seed Unknown | - | - | 2000 | - |

## Wildlife Habitat and Vegetation History

**Table 17R-07.3 - Wildlife Seasonal Habitat.** UDWR wildlife habitat and seasonality.

| Species | Habitat | Season |
|---|---|---|
| Mule Deer | crucial | summer |
| Rocky Mountain Elk | crucial | summer |
| Greater Sage-Grouse | | undefined & undefined |
| Shiras Moose | crucial | winter |

**Table 17R-07.4 - Vegetation History.** The dominant vegetation type(s) and phase of woodland succession (Tausch, Miller, Roundy, & Chambers, 2009).

| Year | Vegetation Type | Woodland Succession |
|---|---|---|
| 2001 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 2005 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 2010 | Mountain Big Sagebrush | No Encroachment |
| 2015 | Mountain Big Sagebrush/Perennial Grass | No Encroachment |
| 2020 | Mountain Big Sagebrush/Perennial Grass | Early Phase I |
| 2025 | Mountain Big Sagebrush | Early Phase I |

## Site Notes

This study was paired with the now-suspended study 17R-08 (Emma Park Harrow Ungrazed) to monitor site differences with and without livestock grazing following a pipe harrow treatment. Cattle grazing will still occur on this site, but not on study 17R-08. The rebar belt markers on this site are only 1/2 inch out of the ground and may be difficult to find.

## Soils

**Table 17R-07.5 - Soil Analysis Data.** List of chemical and textural soil characteristics determined by laboratory analysis.

| Texture | pH | %sand | %silt | %clay | %OM | PPM P | PPM K | ds/m | Sample Date |
|---|---|---|---|---|---|---|---|---|---|
| Clay Loam | 7.5 | 38.9 | 31.4 | 29.6 | 1.8 | 2.8 | 332.8 | 0.7 | 09/05/2001 |

## Site Potential

| | |
|---|---|
| 1981 - 2010 Average Annual Precipitation | 16 inches |
| NRCS Ecological Site | Mountain Loam (Mountain Big Sagebrush) |
| NRCS Ecological Site # | R047XA430UT |
| States and Transitions | 2001-2025 - Current Potential State: Community Phase 2.1 |

Since study establishment in 2001, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and the herbaceous understory have remained co-dominant components of the vegetation community (Table 17R-07.7, Table 17R-07.12). The herbaceous understory has been primarily comprised of perennial grasses throughout the duration of the study, and the presence of introduced species has remained minimal (Table 17R-07.10). Forbs have remained diverse, fairly abundant, and mainly composed of perennial species (Table 17R-07.7, Table 17R-07.11). Heavy grazing or fire could remove key herbaceous components causing the community to transition into a site that is super-dominated by mountain big sagebrush.

The diverse and abundant grass and browse communities on this site could provide adequate forage for summering mule deer. Pellet transect data indicates that deer and elk presence has remained low since 2001. Cattle presence has ranged between low and high; cattle presence was moderate in 2025. Sagebrush density was at it's highest in 2010 but has generally decreased since that time. Sagebrush utilization has also decreased from 90% of plants sampled in density strips being moderately to heavily hedged in 2015 to 26% exhibiting that level of utilization in 2025 (Photos, Table 17R-07.9, Table 17R-07.10, Table 17R-07.11, Table 17R-07.13). On-site observations state that there was light utilization (10-20%) on thickspike wheatgrass (*Elymus lanceolatus*), while there was little to no utilization on forb species during the most recent sample year (2025).

## Trend Summary Tables

**Table 17R-07.6 - Shrub/Tree Summary.** Average modified Daubenmire quadrat and line intercept cover by year for shrubs/trees

| Year | Quadrat Cover (%) | | | Line-intercept Cover (%) | | |
|---|---|---|---|---|---|---|
| | Preferred Shrub | Other Shrub | Tree | Preferred Shrub | Other Shrub | Tree |
| 2001 | 11.1 | 2.7 | - | - | - | - |
| 2005 | 13.7 | 5.3 | - | 18.1 | 6.1 | - |
| 2010 | 15.4 | 3.0 | - | 20.7 | 3.8 | - |
| 2015 | 19.0 | 3.0 | - | 26.3 | 3.1 | - |
| 2020 | 26.4 | 4.8 | - | 40.0 | 4.0 | - |
| 2025 | 26.1 | 4.1 | - | 31.1 | 6.7 | - |

**Table 17R-07.7 - Herbaceous Summary.** Nested frequency and average modified Daubenmire quadrat cover by year for herbaceous functional groups

| Year | Nested Frequency | | | | Quadrat Cover (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb | Annual Grass | Perennial Grass | Annual/Biennial Forb | Perennial Forb |
| 2001 | - | 312 | 25 | 223 | - | 11.5 | 0.1 | 5.3 |
| 2005 | - | 335 | 25 | 204 | - | 12.8 | 0.1 | 4.3 |
| 2010 | - | 352 | 8 | 163 | - | 9.4 | 0.0 | 4.5 |
| 2015 | - | 393 | 17 | 191 | - | 18.0 | 0.1 | 4.8 |
| 2020 | 3 | 356 | 14 | 190 | 0.0 | 16.7 | 0.1 | 6.2 |
| 2025 | - | 374 | 77 | 243 | - | 8.7 | 0.2 | 6.7 |

**Table 17R-07.8 - Basic Ground Cover.** Average modified Daubenmire quadrat cover by year for basic ground cover types.

| Year | Cover Type (%) | | | | | |
|---|---|---|---|---|---|---|
| | Bare Ground | Cryptogams | Litter | Pavement | Rock | Vegetation |
| 2001 | 35.5 | 0.3 | 45.9 | 0.4 | 0.1 | 32.2 |
| 2005 | 38.5 | 0.1 | 38.1 | 0.4 | 0.0 | 33.2 |
| 2010 | 32.1 | 0.0 | 46.8 | 0.2 | - | 30.8 |
| 2015 | 38.4 | 0.0 | 30.5 | 1.3 | 0.2 | 42.1 |
| 2020 | 34.6 | 0.0 | 37.6 | 0.2 | 0.3 | 48.4 |
| 2025 | 37.7 | 0.0 | 37.0 | 1.2 | 0.3 | 44.1 |

**Table 17R-07.9 - Pellet Group Data.** Quadrat frequency and pellet group transect data for animal pellets. Rabbit pellet groups are not sampled in the pellet group transect.

| Year | Cattle | Mule Deer | Rocky Mountain Elk | Rabbit |
|---|---|---|---|---|
| | Quadrat Frequency | | | |
| 2001 | - | 8 | - | 5 |
| 2005 | 3 | - | 4 | 14 |
| 2010 | 8 | 5 | 2 | 1 |
| 2015 | - | 1 | 2 | 44 |
| 2020 | 6 | 1 | - | 12 |
| 2025 | 1 | 2 | 7 | 2 |
| Year | Days Use Per Acre (ha) | | | |
| 2001 | - | 8.7 (21.5) | 0.7 (1.7) | - |
| 2005 | 14.5 (35.9) | 4.7 (11.6) | 5.3 (13.2) | - |
| 2010 | 43.6 (107.6) | 5.3 (13.2) | - | - |
| 2015 | 0.7 (1.8) | 4.0 (9.9) | 0.7 (1.7) | - |
| 2020 | 9.4 (23.3) | 5.3 (13.2) | - | - |
| 2025 | 13.8 (34.1) | 4.7 (11.6) | 8.1 (19.9) | - |

**Table 17R-07.10 - Grass Species.** Nested frequency and modified Daubenmire average cover by year.

| GRASS SPECIES | Achnatherum hymenoides (Indian ricegrass) | Achnatherum lettermanii (Letterman's needlegrass) | Bromus inermis[i] (smooth brome) | Bromus tectorum[ai] (cheatgrass) | Carex (sedge) | Elymus lanceolatus (thickspike wheatgrass) | Leymus cinereus (basin wildrye) | Leymus salinus (saline wildrye) | Poa fendleriana (muttongrass) | Poa pratensis[i] (Kentucky bluegrass) | Poa secunda (Sandberg bluegrass) | Psathyrostachys juncea[i] (Russian wildrye) | Pseudoroegneria spicata (bluebunch wheatgrass) | Thinopyrum intermedium[i] (intermediate wheatgrass) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | |
| 2001 | 4 | 17 | - | - | 0 | 208 | 2 | 87 | 4 | 17 | 20 | - | 18 | 9 |
| 2005 | 2 | 11 | 1 | - | 7 | 141 | - | 164 | 92 | 4 | 36 | 0 | 17 | 10 |
| 2010 | - | 3 | 1 | - | 5 | 205 | - | 175 | 31 | 8 | 23 | - | 26 | 10 |
| 2015 | 1 | 3 | 8 | - | - | 74 | - | 293 | 126 | 5 | 53 | 8 | 3 | 3 |
| 2020 | 45 | - | - | 3 | 8 | 176 | 10 | 208 | 7 | 9 | 8 | 3 | - | 7 |
| 2025 | 4 | 12 | - | - | - | 328 | 3 | 66 | 7 | - | 47 | 2 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | |
| 2001 | 0.1 | 0.1 | - | - | 0.0 | 7.4 | 0.0 | 2.5 | 0.0 | 0.4 | 0.5 | - | 0.3 | 0.1 |
| 2005 | 0.0 | 0.3 | 0.0 | - | 0.0 | 2.2 | - | 6.4 | 2.5 | 0.1 | 0.8 | 0.0 | 0.3 | 0.2 |
| 2010 | - | 0.0 | 0.0 | - | 0.0 | 3.9 | - | 3.9 | 0.5 | 0.2 | 0.3 | - | 0.7 | 0.0 |
| 2015 | 0.0 | 0.0 | 0.0 | - | - | 1.2 | - | 12.4 | 2.4 | 0.1 | 1.3 | 0.2 | 0.2 | 0.0 |
| 2020 | 0.6 | - | - | 0.0 | 0.0 | 5.2 | 0.4 | 10.0 | 0.1 | 0.2 | 0.1 | 0.0 | - | 0.1 |
| 2025 | 0.1 | 0.2 | - | - | - | 6.0 | 0.1 | 1.9 | 0.1 | - | 0.3 | 0.0 | - | - |

a - Annual; n - Noxious Weed; i - Introduced Species

**Table 17R-07.11 - Forb Species.** Nested frequency and modified Daubenmire average cover by year.

| FORB SPECIES | Achillea millefolium (Common yarrow) | Agoseris glauca (pale agoseris) | Alyssum desertorum[ai] (desert madwort) | Androsace septentrionalis[a] (pygmyflower rockjasmine) | Antennaria microphylla (littleleaf pussytoes) | Arabis (rockcress) | Arabis holboellii[a] (Holboell's rockcress) | Astragalus cicer[i] (chickpea milkvetch) | Astragalus convallarius (lesser rushy milkvetch) | Astragalus miser (timber milkvetch) | Astragalus tenellus (looseflower milkvetch) | Calochortus nuttallii (sego lily) | Castilleja flava (yellow Indian paintbrush) | Ceratocephala testiculata[ai] (curveseed butterwort) | Chaenactis douglasii (Douglas' dustymaiden) | Chenopodium album[a] (lambsquarters) | Chenopodium fremontii[a] (Fremont's goosefoot) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2001 | - | - | - | - | 4 | 2 | - | 13 | 18 | - | 1 | - | 66 | - | 24 | - | - |
| 2005 | - | - | - | 2 | 4 | 27 | - | - | 12 | - | 3 | - | 6 | - | 26 | 8 | - |
| 2010 | 2 | - | - | - | 9 | - | - | 4 | 5 | - | 1 | - | 25 | - | 6 | 3 | - |
| 2015 | 3 | 1 | - | 10 | 7 | 10 | - | - | 10 | 3 | 3 | 6 | 28 | - | - | - | 3 |
| 2020 | - | - | - | 11 | - | 10 | - | 7 | 23 | 0 | 1 | 1 | 12 | - | - | - | - |
| 2025 | - | 5 | 19 | 6 | 7 | - | 5 | - | 7 | - | 2 | 2 | 8 | 49 | 3 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2001 | - | - | - | - | 0.0 | 0.0 | - | 0.4 | 0.2 | - | 0.0 | - | 1.2 | - | 0.1 | - | - |
| 2005 | - | - | - | 0.0 | 0.0 | 0.1 | - | - | 0.0 | - | 0.0 | - | 0.0 | - | 0.3 | 0.0 | - |
| 2010 | 0.0 | - | - | - | 0.2 | - | - | 0.0 | 0.0 | - | 0.0 | - | 0.4 | - | 0.0 | 0.0 | - |
| 2015 | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.1 | - | - | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | - | - | - | 0.0 |
| 2020 | - | - | - | 0.0 | - | 0.0 | - | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | - | - | - | - |
| 2025 | - | 0.0 | 0.0 | 0.0 | 0.2 | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Chenopodium leptophyllum[a] (narrowleaf goosefoot) | Cirsium (thistle) | Cleome serrulata[a] (Rocky Mountain beeplant) | Descurainia pinnata[a] (western tansymustard) | Erigeron (fleabane) | Erysimum capitatum[a] (sanddune wallflower) | Gilia inconspicua[a] (shy gilia) | Hedysarum boreale (Utah sweetvetch) | Holosteum umbellatum[ai] (jagged chickweed) | Ipomopsis aggregata (scarlet gilia) | Lactuca serriola[ai] (prickly lettuce) | Linum lewisii (Lewis flax) | Lomatium (desertparsley) | Lotus utahensis (Utah bird's-foot trefoil) | Machaeranthera canescens (hoary tansyaster) | Machaeranthera grindelioides (rayless tansyaster) | Medicago sativa[i] (alfalfa) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | | |
| 2001 | 15 | - | 0 | 2 | - | - | 4 | 11 | - | - | - | 7 | - | 2 | 36 | - | 4 |
| 2005 | 11 | 3 | - | - | 2 | - | - | 29 | - | 19 | 2 | 6 | 0 | - | 45 | - | 0 |
| 2010 | 5 | 4 | - | - | - | - | - | 25 | - | - | - | 1 | - | - | 5 | - | - |
| 2015 | - | 0 | - | - | - | - | 2 | 24 | - | - | 2 | - | - | - | 6 | - | - |
| 2020 | - | 2 | - | - | 1 | - | - | 17 | - | - | - | - | - | - | 1 | 2 | - |
| 2025 | - | - | - | - | - | 2 | - | 18 | 4 | - | - | - | - | - | 3 | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | | |
| 2001 | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.1 | - | - | - | 0.0 | - | 0.0 | 0.4 | - | 0.0 |
| 2005 | 0.0 | 0.0 | - | - | 0.0 | - | - | 1.0 | - | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.8 | - | 0.0 |
| 2010 | 0.0 | 0.2 | - | - | - | - | - | 0.7 | - | - | - | 0.0 | - | - | 0.0 | - | - |
| 2015 | - | 0.0 | - | - | - | - | 0.0 | 0.6 | - | - | 0.0 | - | - | - | 0.0 | - | - |
| 2020 | - | 0.0 | - | - | 0.0 | - | - | 0.4 | - | - | - | - | - | - | 0.0 | 0.0 | - |
| 2025 | - | - | - | - | - | 0.0 | - | 0.1 | 0.0 | - | - | - | - | - | 0.0 | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

| FORB SPECIES | Packera multilobata (lobeleaf groundsel) | Penstemon caespitosus (mat penstemon) | Penstemon palmeri (Palmer's penstemon) | Penstemon watsonii (Watson's penstemon) | Petradoria pumila (rock goldenrod) | Phlox austromontana (mountain phlox) | Phlox longifolia (longleaf phlox) | Polygonum douglasii[a] (Douglas' knotweed) | Potentilla gracilis (slender cinquefoil) | Sanguisorba minor[i] (small burnet) | Schoenocrambe linifolia (flaxleaf plainsmustard) | Sphaeralcea coccinea (scarlet globemallow) | Symphyotrichum ascendens (western aster) | Taraxacum officinale (common dandelion) | Tragopogon dubius[ai] (yellow salsify) | Trifolium (clover) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Nested Frequency | | | | | | | | | | | | | | | |
| 2001 | 3 | 71 | 15 | - | - | 64 | - | 2 | 7 | 13 | - | 39 | - | 2 | 4 | 2 |
| 2005 | 1 | 20 | 7 | 1 | 5 | 72 | 5 | 2 | - | 2 | 3 | 24 | 10 | - | - | - |
| 2010 | 0 | 14 | 13 | - | - | 86 | 4 | - | 6 | - | - | 37 | 6 | - | - | 3 |
| 2015 | 8 | 6 | 2 | 8 | - | 92 | 14 | - | 6 | - | 13 | 45 | 5 | 0 | - | - |
| 2020 | 5 | 12 | 2 | 3 | - | 134 | 3 | 3 | 4 | - | 8 | 37 | 1 | - | - | - |
| 2025 | 2 | 17 | - | 3 | - | 183 | 9 | 6 | 4 | - | 10 | 58 | 4 | - | - | - |
| year | Average Cover (%) | | | | | | | | | | | | | | | |
| 2001 | 0.0 | 0.7 | 0.4 | - | - | 1.1 | - | 0.0 | 0.0 | 0.2 | - | 0.3 | - | 0.0 | 0.0 | 0.0 |
| 2005 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.3 | 0.2 | - | - | - |
| 2010 | 0.0 | 0.1 | 0.1 | - | - | 2.3 | 0.0 | - | 0.1 | - | - | 0.2 | 0.0 | - | - | 0.0 |
| 2015 | 0.1 | 0.1 | 0.0 | 0.2 | - | 2.5 | 0.0 | - | 0.0 | - | 0.0 | 0.4 | 0.1 | 0.0 | - | - |
| 2020 | 0.0 | 0.1 | 0.0 | 0.0 | - | 4.9 | 0.0 | 0.0 | 0.0 | - | 0.1 | 0.2 | 0.0 | - | - | - |
| 2025 | 0.0 | 0.2 | - | 0.0 | - | 5.7 | 0.1 | 0.0 | 0.0 | - | 0.0 | 0.2 | 0.0 | - | - | - |

a - Annual/Biennial; n - Noxious Weed; i - Introduced Species

**Table 17R-07.12 - Shrub and Tree Species.** Average modified Daubenmire quadrat and line intercept cover by year.

| SHRUB SPECIES | Amelanchier utahensis[p] (Utah serviceberry) | Artemisia tridentata ssp. vaseyana[p] (mountain big sagebrush) | Atriplex canescens[p] (fourwing saltbush) | Chrysothamnus depressus[p] (longflower rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus (yellow rabbitbrush) | Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus (yellow rabbitbrush) | Ericameria nauseosa (rubber rabbitbrush) | Ericameria nauseosa ssp. nauseosa var. speciosa[p] (rubber rabbitbrush) | Gutierrezia sarothrae (broom snakeweed) | Krascheninnikovia lanata[p] (winterfat) | Opuntia (pricklypear) | Symphoricarpos oreophilus[p] (mountain snowberry) | Tetradymia canescens (spineless horsebrush) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | Line Intercept Cover (%) | | | | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2005 | - | 17.6 | - | - | 4.1 | - | 1.6 | - | 0.2 | - | - | 0.5 | 0.2 |
| 2010 | - | 20.4 | - | - | 3.1 | - | 0.7 | - | - | - | - | 0.3 | 0 |
| 2015 | - | 25.6 | - | 0.5 | 2.2 | - | 0.5 | - | 0 | - | - | 0.2 | 0.4 |
| 2020 | - | 37.9 | - | 1.7 | 2.5 | - | 1.1 | 0.2 | 0.4 | - | - | 0.2 | - |
| 2025 | - | 30.4 | - | - | 3.5 | 2.5 | 0.4 | 0.5 | 0.1 | - | - | 0.2 | 0.2 |
| year | Quadrat Cover (%) | | | | | | | | | | | | |
| 2001 | 0.0 | 11.1 | - | - | 2.5 | - | 0.2 | - | - | - | - | 0.0 | - |
| 2005 | - | 13.7 | - | - | 2.4 | - | 1.6 | - | 1.2 | - | - | 0.0 | 0.1 |
| 2010 | - | 15.1 | 0.2 | 0.0 | 2.4 | - | 0.4 | - | 0.0 | - | - | 0.1 | 0.2 |
| 2015 | - | 18.1 | - | 0.7 | 1.9 | - | 0.6 | - | 0.2 | - | 0.0 | 0.2 | 0.2 |
| 2020 | 0.0 | 25.5 | - | 0.9 | 2.7 | - | 1.6 | 0.0 | 0.5 | 0.0 | - | 0.0 | - |
| 2025 | - | 25.7 | - | 0.1 | 2.4 | 0.7 | 0.8 | 0.0 | 0.1 | - | 0.0 | 0.3 | 0.0 |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17R-07.13 - Shrub/Tree Characteristics.** Population characteristics of shrub/tree species populations including density reproduction (seedlings), age distribution, utilization, vigor and average size (height/crown) of plants.

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Amelanchier utahensis[p] -- (Utah serviceberry) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | 33/53 |
| 2005 | - | - | - | - | - | - | - | - | 29/37 |
| 2010 | - | - | - | - | - | - | - | - | 22/29 |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 100 | 23/40 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Artemisia tridentata ssp. vaseyana[p] -- (mountain big sagebrush) | | | | | | | | | |
| 2001 | 3980 | 260 | 17 | 45 | 39 | 0 | 0 | 57 | 42/61 |
| 2005 | 4780 | 23380 | 25 | 67 | 8 | 2 | 0 | 4 | 52/69 |
| 2010 | 15400 | 7140 | 67 | 32 | 2 | 13 | 2 | 3 | 51/73 |
| 2015 | 10820 | 20 | 33 | 62 | 6 | 46 | 44 | 8 | 48/67 |
| 2020 | 8800 | 320 | 23 | 72 | 5 | 38 | 20 | 20 | 52/76 |
| 2025 | 9660 | 3020 | 26 | 62 | 12 | 26 | 0 | 12 | - / - |
| Chrysothamnus depressus[p] -- (longflower rabbitbrush) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 1040 | - | 40 | 60 | 0 | 42 | 48 | 0 | 14/28 |
| 2020 | 760 | - | 11 | 90 | 0 | 0 | 53 | 29 | 13/37 |
| 2025 | 160 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus -- (yellow rabbitbrush) | | | | | | | | | |
| 2001 | 3820 | - | 3 | 93 | 4 | 0 | 0 | 1 | 11/21 |
| 2005 | 3440 | 20 | 1 | 97 | 2 | 0 | 0 | 1 | 20/37 |
| 2010 | 4420 | 180 | 21 | 79 | 0 | 1 | 5 | 0 | 16/27 |
| 2015 | 2780 | - | 16 | 84 | 0 | 38 | 0 | 0 | 16/28 |
| 2020 | 2380 | - | 1 | 99 | 0 | 36 | 0 | 9 | 14/29 |
| 2025 | 2960 | - | 0 | 95 | 5 | 51 | 5 | 6 | - / - |
| Chrysothamnus viscidiflorus ssp. viscidiflorus var. viscidiflorus -- (yellow rabbitbrush) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | -/- |
| 2025 | 660 | - | 0 | 97 | 3 | 3 | 0 | 3 | - / - |
| Eriogonum corymbosum -- (crispleaf buckwheat) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | 29/42 |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | -/- |
| 2020 | - | - | - | - | - | - | - | - | 28/33 |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Ericameria nauseosa -- (rubber rabbitbrush) | | | | | | | | | |
| 2001 | 180 | - | 22 | 22 | 56 | 0 | 0 | 22 | 49/52 |
| 2005 | 260 | 40 | 8 | 92 | 0 | 0 | 0 | 0 | 58/67 |
| 2010 | 400 | 20 | 20 | 80 | 0 | 0 | 0 | 5 | 52/56 |
| 2015 | 200 | - | 0 | 80 | 20 | 0 | 20 | 40 | 46/51 |
| 2020 | 220 | - | 0 | 91 | 9 | 18 | 9 | 27 | 56/61 |
| 2025 | 280 | - | 29 | 57 | 14 | 0 | 0 | 21 | - / - |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 70/62 |
| 2020 | 40 | - | 0 | 0 | 100 | 50 | 0 | 100 | 49/60 |
| 2025 | 320 | - | 6 | 75 | 19 | 63 | 6 | 19 | - / - |
| Gutierrezia sarothrae -- (broom snakeweed) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | 340 | - | 0 | 100 | 0 | 0 | 0 | 0 | 20/32 |
| 2010 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 16/30 |
| 2015 | 240 | - | 25 | 75 | 0 | 58 | 0 | 0 | 15/27 |
| 2020 | 520 | - | 8 | 92 | 0 | 0 | 0 | 0 | 15/20 |
| 2025 | 260 | - | 15 | 77 | 8 | 0 | 0 | 8 | - / - |
| Krascheninnikovia lanata[P] -- (winterfat) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 10/11 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | 17/18 |
| 2025 | - | - | - | - | - | - | - | - | -/- |

| Year | Density | | Age Class Distribution | | | Utilization | | Poor Vigor (%) | Average Height Crown (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | Plants Per Acre | | Excluding Seedlings | | | | | | |
| | Excluding Seedlings | Seedling | Young (%) | Mature (%) | Decadent (%) | Moderate (%) | Heavy (%) | | |
| Opuntia -- (pricklypear) | | | | | | | | | |
| 2001 | - | - | - | - | - | - | - | - | -/- |
| 2005 | - | - | - | - | - | - | - | - | -/- |
| 2010 | - | - | - | - | - | - | - | - | -/- |
| 2015 | - | - | - | - | - | - | - | - | 7/8 |
| 2020 | 20 | - | 0 | 100 | 0 | 0 | 0 | 0 | - / - |
| 2025 | - | - | - | - | - | - | - | - | -/- |
| Symphoricarpos oreophilus[p] -- (mountain snowberry) | | | | | | | | | |
| 2001 | 240 | - | 42 | 25 | 33 | 0 | 0 | 8 | 26/42 |
| 2005 | 280 | - | 50 | 50 | 0 | 0 | 7 | 0 | 30/50 |
| 2010 | 220 | - | 18 | 82 | 0 | 36 | 9 | 0 | 35/48 |
| 2015 | 200 | - | 10 | 90 | 0 | 0 | 0 | 0 | 29/42 |
| 2020 | 160 | - | 63 | 38 | 0 | 38 | 13 | 0 | 22/35 |
| 2025 | 160 | - | 0 | 50 | 50 | 13 | 13 | 50 | - / - |
| Tetradymia canescens -- (spineless horsebrush) | | | | | | | | | |
| 2001 | 80 | 20 | 0 | 25 | 75 | 0 | 0 | 50 | - / - |
| 2005 | 220 | 20 | 36 | 64 | 0 | 0 | 0 | 0 | 23/30 |
| 2010 | 160 | - | 38 | 63 | 0 | 0 | 0 | 13 | 25/25 |
| 2015 | 120 | 40 | 0 | 100 | 0 | 33 | 0 | 0 | 24/33 |
| 2020 | 60 | - | 0 | 100 | 0 | 67 | 0 | 33 | 20/32 |
| 2025 | 120 | - | 0 | 50 | 50 | 17 | 0 | 50 | - / - |

t - Tree Species; p - Preferred Browse; i - Introduced Species

**Table 17R-07.14 - Tree Characteristics.** Point-quarter tree density, size class distribution, and average diameter.

| Year | Density | Size Class Distribution | | | | | Average Diameter (cm) |
|---|---|---|---|---|---|---|---|
| | Trees per Acre | Seedling (%) | 1-4' (%) | 4-8' (%) | 8-12' (%) | >12' (%) | |
| Juniperus scopulorum (Rocky Mountain juniper) | | | | | | | |
| 2020 | 3 | - | - | 100 | - | - | 15.0 |
| 2025 | 3 | - | 100 | - | - | - | 6.0 |

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# APPENDIX A - VEGETATION TYPE

VEGETATION COMMUNITY TYPE CLASSIFICATION--

| Vegetation Type Code | Vegetation Community Type Name* | Description |
|---|---|---|
| ANN GRASS | Annual Grass | Annual grasses provide the dominant vegetation cover. |
| PER GRASS | Perennial Grass | Perennial grasses provide the dominant vegetation cover. |
| ANN-PER GRASS | Annual-Perennial Grass | Mixture of Annual and Perennial grass species provide the dominant vegetation cover. |
| ANN GRASS-FORB | Annual Grass-Forb | Mixture of Annual grass and forb species provide the dominant vegetation cover. |
| PER GRASS-FORB | Perennial Grass-Forb | Mixture of Perennial grass and forb species provide the dominant vegetation cover. |
| ANN FORB | Annual Forb | Annual forbs provide the dominant vegetation cover |
| PER FORB | Perennial Forb | Perennial forbs provide the dominant vegetation cover |
| ANN-PER FORB | Annual-Perennial Forb | Mixture of Annual and Perennial forb species provide the dominant vegetation cover. |
| WEED | Annual-Perennial Weed | Annual and/or Perennial weedy species provide the dominant vegetation cover. |
| WET MEADOW | Wet Meadow | Riparian vegetation species provide the dominant vegetation cover |
| DRY MEADOW | Dry Meadow | High elevation subalpine meadow |
| RIPAR | Riparian | Riparian vegetation species provide the dominant vegetation cover. |
| ALP GRASS | Alpine Grass | Grass or grass-like species provide the dominant vegetation cover |
| ALP FORB | Alpine Forb | Forb species provide the dominant vegetation cover |
| ALP SHRUB | Alpine Shrub | Alpine shrub species provide the dominant vegetation cover |
| ALP MIX | Alpine-Mixed | Mixture of grass, forb, or shrub species provide the dominant vegetation cover |
| ARTRT | Basin Big Sagebrush | Major component of the site (typically >5% cover). |
| ARTRV | Mountain Big Sagebrush | Major component of the site (typically > 5% cover). |
| ARTRW | Wyoming Big Sagebrush | Major component of the site (typically >5% cover). |
| ARAR | Low Sagebrush | Major component of the site (typically >5% cover). |
| ARCA | Silver Sagebrush | Major component of the site (typically >5% cover). |
| ARNO | Black Sagebrush | Major component of the site (typically >5% cover). |
| ARSP | Bud Sagebrush | Major component of the site (typically >5% cover). |
| ARFR | Fringed Sagebrush | Major component of the site (typically >5% cover). |
| CHNA | Rubber Rabbitbrush | Major component of the site (typically >5% cover). |
| CHPA | Parry Rabbitbrush | Major component of the site (typically >5% cover). |
| CHVI | Low Rabbitbrush | Major component of the site (typically >5% cover). |
| GUSA | Broom Snakeweed | Major component of the site (typically >5% cover). |
| SAVE | Black Greasewood | Major component of the site (typically >5% cover). |
| CELA | Winterfat | Major component of the site (typically >5% cover). |
| ATCO | Shadscale | Major component of the site (typically >5% cover). |
| ATCA | Fourwing Saltbush | Major component of the site (typically >5% cover). |
| GRSP | Spiny Hopsage | Major component of the site (typically >5% cover). |
| MSDS | Mixed Salt Desert Shrub | Mixture of one or more Salt Desert species (ATCO, ATCA, GRSP, etc.) with no one species expressing dominance. |
| LARRE | Creosote Bush | Major component of the site (typically >5% cover). |
| CORA | Blackbrush | Major component of the site (typically >5% cover). |
| PRFA | Desert Almond | Major component of the site (typically >5% cover). |
| EPHED | Ephedra | Major component of the site (typically >5% cover). |
| QUGA | Gambel Oak | Major component of the site (typically >5% cover). |

| Vegetation Type Code | Vegetation Community Type Name* | Description |
|---|---|---|
| QUTU | Live Oak | Major component of the site (typically >5% cover). |
| SYOR | Snowberry | Major component of the site (typically >5% cover). |
| AMAL | Serviceberry | Major component of the site (typically >5% cover). |
| PUTR | Bitterbrush | Major component of the site (typically >5% cover). |
| PUGL | Desert Bitterbrush | Major component of the site (typically >5% cover). |
| ARCT2 | Manzanita | Major component of the site (typically >5% cover). |
| CEMOM | True Mountain Mahogany | Major component of the site (typically >5% cover). |
| CELEL | Curlleaf Mountain Mahogany | Major component of the site (typically >5% cover). |
| COMES | Stansbury Cliffrose | Major component of the site (typically >5% cover). |
| KOPR | Forage Kochia | Major component of the site (typically >5% cover). |
| TAMARIX | Tamarix | Major component of the site (typically >5% cover). |
| MMB | Mixed Mountain Brush | Mixture of one or more Mountain brush species (ARTRV, AMAL, CEMOM, etc.) with no one species expressing dominance. |
| MB | Mixed Shrub | Mixture of various shrub species with none expressing dominance. |
| CHAPARRAL | Chaparral | Mixture of fire tolerant shrub species. |
| JUNIPER | Juniper | Major component of the site (Phase III[1]). No pinyon present. |
| PINYON | Pinyon | Major component of the site (Phase III[1]). No juniper present. |
| PJ | Pinyon-Juniper | Major components of the site (Phase III[1]). Pinyon and Juniper present. |
| POTR | Quaking Aspen | POTR provides the dominant overstory (typically >5% cover). |
| POTR-CE | Quaking Aspen-Conifer Encroached | Mixture of QUGA and Conifers (conifers typically provide >5% cover). |
| PIPO | Ponderosa Pine | PIPO provides the dominant overstory (typically >5% cover). |
| PSMEM | Douglas Fir | Major component of the site (typically >5% cover). |
| ABCO | White Fir | Major component of the site (typically >5% cover). |
| PIFL | Limber Pine | Major component of the site (typically >5% cover). |
| PICO | Lodgepole Pine | Major component of the site (typically >5% cover). |
| PILO | Bristlecone Pine | Major component of the site (typically >5% cover). |
| PIEN | Engelmann Spruce | Major component of the site (typically >5% cover). |
| ABLA | Subalpine Fir | Major component of the site (typically >5% cover). |
| SUBALP | Subalpine Forest | Mixture of PIEN and ABLA provide the dominant vegetation cover |
| MIX CON | Mixed Conifer Forest | Mixture of conifer tree species provide the dominant vegetation cover |
| AG-PAST | Agricultural-Pasture | Active or abandoned agricultural pasture |
| AG-CL | Agricultural-Cropland | Active or abandoned agricultural cropland |

*Vegetation types can be co-dominant on the study site and when more than one vegetation community types are co-dominant and are major components of the site a (/) is used to separate vegetation community types.
[1]Phase of woodland succession