

RAC AGENDA – November 2020

Electronic Meetings Only



1. Welcome, RAC Introductions and RAC Procedure
- RAC Chair
2. Approval of Agenda and Minutes
- RAC Chair
3. Wildlife Board Meeting Update
- RAC Chair **INFORMATIONAL**
4. Regional Update
- DWR Regional Supervisor **INFORMATIONAL**
5. Waterfowl Recommendations and R657- Amendments
- Blair Stringham, Migratory Game Bird Program Coordinator **ACTION**
6. 2021 Big Game Seasons, Key Dates, Hunt Changes and Rule Amendments
- Covy Jones, Big Game Coordinator **ACTION**
7. Deer Management Plans – Population Objective Recommendations
- Regional Presentations **ACTION**
8. Deer Management Plans – Unit Plan Revision Recommendations
- Regional Presentations **ACTION**
9. CWMU and Landowner 2021 Permit Recommendations
- Chad Wilson, Public Wildlife/Private Lands Coordinator **ACTION**

Meeting Locations

CR RAC – Nov. 10th 6:00 PM
<https://youtu.be/qeUBXZ0l4Kk>

SER RAC – Nov. 18th 6:30 PM
<https://youtu.be/9QSBVivMV0E>

NR RAC – Nov. 12th Thursday 6:00 PM
<https://youtu.be/TxVcQBVPacA>

NER RAC – Nov. 19th 6:30 PM
https://youtu.be/oYgogmJT_pQ

SR RAC – Nov. 17th 6:00 PM
<https://youtu.be/rTD0u0d7FJw>

Board Meeting – December 3rd 9:00 AM
<https://youtu.be/8t7rVxnI3qE>

Due to the COVID-19 pandemic and the ability of the virus to spread from person to person, the Governor has implemented a number of Executive Orders directed at controlling spread of the virus by minimizing face-to-face interactions. Public gatherings are strongly discouraged by the CDC, State of Utah, and local health departments since they facilitate face-to-face contact and pose an elevated risk for virus transmission. The Division of Wildlife Resources and the chair of this public body have determined that public gathering at Regional Advisory Council and Wildlife Board meetings presents a substantial risk to the health and safety of those who attend—and will conduct this meeting using a fully electronic format. This meeting format is authorized by recent amendment to the Utah Code¹ and Executive Order by Utah Governor Gary Herbert²—and will be temporarily used in place of the in-person public meetings that usually occur around the state. Anyone wishing to comment on agenda topics in future meetings or to observe this meeting may do so by logging on to the Division’s webpage at <https://wildlife.utah.gov/feedback.html> where instructions and links are provided.

¹ Utah Code Section 52-4-207(4).

² Executive Order Suspending the Enforcement of Provisions of Utah Code §§ 52-4-202 and 52-4-207, and Related State Agency Orders, Rules, and Regulations, Due to Infectious Disease COVID-19 Novel, March 18, 2020.



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

BRIAN C. STEED
Executive Director

Division of Wildlife Resources

MICHAL D. FOWLKS
Interim Division Director

MEMORANDUM

Date: October 22, 2020

To: Wildlife Board and Regional Advisory Council Members

From: Blair Stringham, Migratory Game Bird Program Coordinator

Subject: WATERFOWL RULE CHANGES

The Utah Division of Wildlife Resources is proposing the following changes to Rule R657-9:

- 1) Allow permanent blinds on Willard Spur WMA with agency permission.
- 2) Add Willard Spur WMA to the non-toxic shot list.
- 3) Create a retrieval zone around Farmington Bay WMA rest area.

R657. Natural Resources, Wildlife Resources.

R657-9. Taking Waterfowl, Wilson's Snipe and Coot.

R657-9-1. Purpose and Authority.

(1) Under authority of Sections 23-14-18 and 23-14-19, and in accordance with 50 CFR 20, 50 CFR 32.64 and 50 CFR 27.21, 2004 edition, which is incorporated by reference, the Wildlife Board has established this rule for taking waterfowl, Wilson's snipe, and coot.

(2) Specific dates, areas, limits, requirements and other administrative details which may change annually are published in the guidebook of the Wildlife Board for taking waterfowl, Wilson's snipe and coot.

R657-9-8. Nontoxic Shot.

(1) Only nontoxic shot may be in possession or used while hunting waterfowl and coot.

(2) A person may not possess or use lead shot:

(a) while hunting waterfowl or coot in any area of the state;

(b) on federal refuges;

(c) on the following waterfowl management areas: Bicknell Bottoms, Blue Lake, Brown's Park, Clear Lake, Desert Lake, Farmington Bay, Harold S. Crane, Howard Slough, Locomotive Springs, Manti Meadow, Mills Meadows, Ogden Bay, Powell Slough, Public Shooting Grounds, Salt Creek, Stewart's Lake, Timpie Springs, [Willard Spur](#); or

(d) on the Scott M. Matheson or Utah Lake wetland preserve.

R657-9-30. Rest Areas and No Shooting Areas.

(1) A person may only access and use state waterfowl management areas in accordance with state and federal law, state administrative code, and proclamations of the Wildlife Board.

(2)(a) The division may establish portions of state waterfowl management areas as "rest areas" for wildlife that are closed to the public and trespass of any kind is prohibited.

(b) In addition to any areas identified in the proclamation of the Wildlife Board for taking waterfowl, Wilson's snipe, and coot, the following areas are designated as rest areas:

(i) That portion of Clear Lake Waterfowl Management Area known as Spring Lake;

(ii) That portion of Desert Lake Waterfowl Management Area known as Desert Lake;

(iii) That portion of Public Shooting Grounds Waterfowl Management Area that lies above and adjacent to the Hull Lake Diversion Dike known as Duck Lake;

(iv) That portion of Salt Creek Waterfowl Management Area known as Rest Lake;

(v) That portion of Farmington Bay Waterfowl Management Area that lies in the northwest quarter of unit one; and

(iv) That portion of Ogden Bay Waterfowl Management Area known as North Bachman.

(c) Maps of all rest areas will be available at division offices, on the division's website, and to the extent necessary, marked with signage at each rest area.

(3)(a) The division may establish portions of state waterfowl management areas as “No Shooting Areas” where the discharge of weapons for the purposes of hunting is prohibited.

(b) No Shooting Areas remain open to the public for other lawful activities.

(c) In addition to any areas identified in the proclamation of the Wildlife Board for taking waterfowl, Wilson’s snipe, and coot, the following areas are No Shooting Areas:

(i) All of Antelope Island, including all areas within 600 feet of the upland vegetative line or other clearly defined high water mark;

(ii) Within 600 feet of the north and south side of the center line of Antelope Island causeway;

(iii) Within 600 feet of all structures found at Brown's Park Waterfowl Management Area;

(iv) The following portions of Farmington Bay Waterfowl Management Area:

(A) within 600 feet of the Headquarters;

(B) within 600 feet of dikes and roads accessible by motorized vehicles; ~~and~~

(C) within the area designated as the Learning Center; and

(D) within the 100 yard buffer around the Farmington Bay Waterfowl Management Area rest area.

(v) Within 600 feet of the headquarters area of Ogden Bay Waterfowl Management Area;

(vi) Within the boundaries of all State Parks except those designated open by appropriate signage as provided in Rule R651-614-4;

(vii) Within 1/3 of a mile of the Great Salt Lake Marina;

(viii) Below the high-water mark of Gunnison Bend Reservoir and its inflow upstream to the Southerland Bridge, Millard County;

(xi) All property within the boundary of the Salt Lake International Airport; and

(x) All property within the boundaries of federal migratory bird refuges, unless hunting waterfowl specifically authorized by the federal government.

(4) The division reserves the right to manage division lands and regulate their use consistent with Utah Code § 23-21-7 and Utah Administrative Code R657-28.

R657-9-34. Waterfowl Blinds on Waterfowl Management Areas

(1) Waterfowl blinds on division waterfowl management areas may be constructed or used as provided in Subsection (a) through Subsection (e).

(a) Waterfowl blinds may not be left unattended overnight, except for blinds constructed entirely of non-woody, vegetative materials that naturally occur where the blind is located.

(b) Trees and shrubs on waterfowl management areas that are live or dead standing may not be cut or damaged except as expressly authorized in writing by the division.

(c) Excavating soil or rock on waterfowl management areas above or below water surface is strictly prohibited, except as expressly authorized in writing by the division.

(d) Rock and soil material may not be transported to waterfowl management areas for purposes of constructing a blind.

(e) Waterfowl blinds may not be constructed or used in any area or manner, which obstructs vehicular or pedestrian travel on dikes.

(2) The restrictions set forth in Subsection (1)(a) through Subsection (1)(c) do not apply to the following waterfowl management areas:

(a) Farmington Bay Waterfowl Management Area - West and North of Unit 1, Turpin Unit, and Doug Miller Unit.

(b) Howard Slough Waterfowl Management Area - West and South of the exterior dike separating the waterfowl management area's fresh water impoundments from the Great Salt Lake.

(c) Ogden Bay Waterfowl Management Area - West of Unit 1, Unit 2, and Unit 3.

(d) Harold Crane Waterfowl Management Area - one half mile North and West of the exterior dike separating the waterfowl management area's fresh water impoundments from Willard Spur.

(3) The restrictions set forth in Subsection (1)(a) through Subsection (1)(c) do not apply to blinds on Willard Spur Waterfowl Management Area; and:

(a) the placement of any new permanent blind will require written permission from UDWR and FFSL.

(4) Waterfowl blinds constructed or maintained on waterfowl management areas in violation of this section may be removed or destroyed by the division without notice.

(4)5) Any unoccupied, permanent waterfowl blind located on state land open to public access for hunting may be used by any person without priority to the person that constructed the blind. It being the intent of this rule to make such blinds available to any person on a first-come, first-serve basis.

(5)6) Waterfowl blinds or decoys cannot be left unattended overnight on state land open to public access for hunting in an effort to reserve the particular location where the blinds or decoys are placed.

KEY: wildlife, birds, migratory birds, waterfowl

Date of Enactment or Last Substantive Amendment: August 10, 2020

Notice of Continuation August 1, 2016

Authorizing, and Implemented or Interpreted Law: 23-14-19; 23-14-18; 50 CFR part

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DEPARTMENT OF NATURAL RESOURCES

BRIAN C. STEED
Executive Director

Division of Wildlife Resources

MICHAL D. FOWLKS
Division Director

MEMORANDUM

Date: October 30, 2020

To: Wildlife Board and Regional Advisory Council Members

From: Covy Jones, Big Game Coordinator

Subject: 2021 big game proposed season dates, boundary changes, hunt changes, rule change (R657-38) and statewide elk plan amendments.

The attached documents summarize the DWR's recommended changes to the big game guidebook.

Big game season dates:

See attached tables for details.

Big game guidebook recommendations by species:

Deer

1. New hunt:
 - a. North Slope (early), any legal weapon hunt from Oct. 13–17, 2021
2. Discontinued hunts:
 - a. Henry Mtns management buck hunts
 - b. North Slope, Summit limited-entry hunt

Elk

1. We conducted a mid-plan review with the statewide elk committee, and the committee discussed the issues listed below. Changes to the plan recommended by the committee are included in the packet of materials:
 - a. Reviewed unit age objectives
 - b. Looked for options to increase opportunity in our limited-entry hunts (e.g., HAMS hunts and September archery hunts)
 - c. Looked for options to increase opportunity in the general-season any-bull elk hunts
2. New age objectives:
 - a. Book Cliffs, Little Creek
 - i. Currently 7.5-8.0

- ii. Recommended 6.5-7.0
 - b. Cache, Meadowville
 - i. Currently 4.5-5.0
 - ii. Recommended 6.5-7.0
 - c. Central Mountains, Nebo
 - i. Currently 6.5-7.0
 - ii. Recommended 5.5-6.0
- 3. New limited-entry hunts:
 - a. We recommend adding new archery hunts (Sept. 1–30, 2021) and handgun-archery-muzzleloader-shotgun (HAMS) hunts (Oct. 1–Nov. 15, 2021) on these four limited-entry elk units:
 - i. Cache, North
 - ii. Oquirrh-Stansbury, West
 - iii. Plateau, Barney Top/Kaiparowits
 - iv. West Desert, Deep Creek
 - b. Box Elder, Pilot Mtn archery hunt (Aug. 21–Sept. 10, 2021)
- 4. Discontinued current limited-entry hunts:
 - a. We recommend discontinuing the current limited-entry hunts on the following units to allow either a new limited-entry opportunity (described above in 3a) or a new general-season any-bull elk unit (described below in 6a):
 - i. Cache, North
 - ii. Nine Mile, Anthro
 - iii. Oquirrh-Stansbury
 - iv. West Desert, Deep Creek
- 5. Boundary changes:
 - a. We recommend boundary changes to the current limited-entry units to allow either a new limited-entry opportunity (described above in 3a) or a new general-season unit (described below in 6a):
 - i. Plateau, Boulder
 - ii. Southwest Desert, South
 - iii. Box Elder, Grouse Creek
- 6. New general-season elk units:
 - a. We recommend the following units be added to the any-bull elk hunt:
 - i. Box Elder, Sawtooth
 - ii. Nine Mile, Anthro
 - iii. Oquirrh-Stansbury, East
 - iv. Southwest Desert, North
- 7. General-season elk hunts:

- a. After meeting with the elk committee, we recommend modifying the elk management plan to allow an unlimited number of any-bull elk permits, this recommendation is made in an attempt to accomplish the following:
 - i. Expand opportunity for families
 - ii. Strengthen ties to our hunting heritage
 - iii. Provide a challenge — not an easy hunt

Pronghorn

1. New hunts:
 - a. Fillmore, Oak Creek South muzzleloader (Sept. 29–Oct. 7, 2021)
 - b. North Slope, Three Corners/West Daggett muzzleloader (Sept. 29–Oct. 7, 2021)
 - c. Plateau, Highlands
 - i. Archery (Aug. 21–Sept. 17, 2021)
 - ii. Muzzleloader (Sept. 29–Oct. 7, 2021)
 - iii. Any legal weapon (Sept. 18–26, 2021)
2. Discontinued hunts:
 - a. Plateau, Parker Mtn
 - i. Archery (Aug. 21–Sept. 17)
 - ii. Muzzleloader (Sept. 29–Oct. 7)
 - iii. Any legal weapon (Sept. 18–26)

Bison

1. New hunt:
 - a. Book Cliffs, Wild Horse Bench hunter's choice (Aug. 1, 2021–Jan. 31, 2022)
2. Boundary change:
 - a. Nine Mile (over-the-counter bison)
3. Discontinued hunts:
 - a. Book Cliffs, Bitter Creek/South (cow only)
 - b. Henry Mtns (archery, hunter's choice)
 - c. Henry Mtns (archery, cow only)

Desert bighorn sheep

1. Discontinued hunt
 - a. Zion (archery)

Rocky Mountain bighorn sheep

1. New hunt:
 - a. Fillmore, Oak Creek (archery)
2. Discontinued hunt:
 - a. Box Elder, Pilot Mtn

3. Boundary changes:
 - a. North Slope, Three Corners-Bare Top
 - b. North Slope, Summit/West Daggett

Dedicated hunter rule (Utah Admin. Rule R657-38)

1. Proposed change:
 - a. Limit the number of dedicated hunter permits available in the big game drawing to the following:
 - i. 15% of the total annual general-season buck deer quota for each unit
 - ii. A maximum of one resident and one non-resident permit, if the unit's 15% total is met or exceeded

Boundary descriptions for new hunts — and boundary changes for existing hunts — are included in the packet.

**UTAH STATEWIDE
ELK MANAGEMENT PLAN**



**UTAH DIVISION OF WILDLIFE RESOURCES
DEPARTMENT OF NATURAL RESOURCES**

UTAH DIVISION OF WILDLIFE RESOURCES STATEWIDE MANAGEMENT PLAN FOR ELK

I. PURPOSE OF THE PLAN

A. General

The statewide elk management plan provides overall guidance and direction for Utah's elk management program. This plan briefly describes general information on elk natural history, management, habitat, and population status. This statewide elk management plan was revised by a 20 person advisory committee. The committee was diverse and had representation from: the Utah Wildlife Board, 5 Regional Advisory Councils, Brigham Young University, Rocky Mountain Elk Foundation, Sportsmen for Fish and Wildlife, Utah Bowman's Association, US Forest Service, Bureau of Land Management, Utah Farm Bureau, Cooperative Wildlife Management Unit Association, Utah Guides and Outfitters, Utah State Legislature, private landowners, livestock permittees, public at large, and Utah Division of Wildlife Resources (UDWR). This group met five times from June 2 to August 11, 2015. The committee identified components of the last elk plan that were working well and areas that could be improved upon, and then developed goals, objectives, and strategies to address those management issues.

B. Dates Covered

The elk plan was approved by the Wildlife Board on December 2, 2015 and will be in effect until December 2022. On Sept. 1, 2020 the statewide elk committee reconvened and conducted a mid-plan review to review and address issues identified by the Utah Wildlife Board and DWR. The recommendations of the committee were taken into account, and the plan was updated to reflect those changes in November 2020.

II. SPECIES ASSESSMENT

A. Natural History

Elk (*Cervus elaphus*) are members of the cervid family along with deer, moose, and caribou. Elk are the same species as European red deer, even though visually they are quite different. North American elk are also commonly called wapiti to distinguish them from European red deer. Wapiti is the Shawnee name for elk and means "white rump" or "white deer." There are six recognized subspecies of elk in North America with all of the elk in Utah of the subspecies known as Rocky Mountain elk (*C. e. nelsoni*). In 1971, the Rocky Mountain elk was designated as Utah's state animal.

Elk males, females, and young are known as bulls, cows, and calves, respectively. Calves are generally born as singles (twins are extremely rare) after a gestation period of approximately 8–8.5 months. Calves are normally born from mid May until early June and weigh approximately 13 pounds at birth. Elk are gregarious animals and, as such, often gather into large nursery bands of cows and calves in early summer. During this time, it is common to see groups of several hundred elk. Within a few weeks those nursery bands disperse into smaller groups across the

summer range.

The antlers of bulls begin to grow as soon as the old antlers are shed in late winter or early spring. Bulls generally segregate from cows and calves through the summer antler growing period and often band together in small groups during this time. The velvet that covers and provides nourishment to the growing antlers begins to shed in early August. In Utah, the rut or breeding period for elk begins in early September and continues until mid October with the peak of the rut typically occurring in mid to late September. In early September, bulls begin to bugle and gather cows into harems of approximately 10–20 females. Breeding bulls vigorously defend their harems from other “satellite” bulls who attempt to steal cows for themselves.

After the rut, bulls leave the cows and calves and either become reclusive or band together with other bulls. It is common to see large groups of bulls in the late fall and winter. In late spring, cows seek solitude for calving. At this time, yearlings from the previous year are often aggressively driven away by the cows and forced to find new home ranges. As new calves are born, the cycle of life begins again.

B. Management

1. UDWR Regulatory Authority

The Utah Division of Wildlife Resources operates under the authority granted by the Utah Legislature in Title 23 of the Utah Code. The Division was created and established as the wildlife authority for the state under section 23-14-1 of the Code. This Code also vests the Division with necessary functions, powers, duties, rights, and responsibilities associated with wildlife management within the state. Division duties are to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state.

2. Past and Current Management

Elk along with bighorn sheep were probably the most common game animals in Utah prior to settlement times. Indians, trappers, and pioneers all used elk as a source of food and clothing. Unrestricted hunting eliminated most of the elk in Utah by the end of the nineteenth century. Because of the low elk numbers, elk hunting seasons were closed in Utah in 1898.

Large scale transplant efforts are a major reason for the reestablishment of elk in Utah. Interstate transplants of elk occurred from 1912 to 1925 to reestablish elk to their historical ranges. During that period, elk were transplanted from Yellowstone National Park and released on the Fishlake, Oquirrh Mountains, Mount Timpanogos, Mount Nebo, Logan Canyon, and Manti units. A few elk were also captured from Montana and released in Smithfield Canyon during that period. In addition to the interstate transplant efforts, elk have also been captured and transplanted to and from source herds within Utah. Those transplants occurred in the late 1970s and 1980s and were mainly released on the eastern and southern Utah mountain ranges.

Elk herds in Utah were managed by the Board of Big Game Control from 1925 until 1996. In 1996, the Board of Big Game Control was abolished and replaced with five Regional Advisory

Councils and a Wildlife Board that regulate the management of all wildlife in Utah.

Elk were hunted under a limited entry hunting system until 1967 when the Board of Big Game Control adopted an “open bull” hunt strategy on most large elk units. Smaller elk units continued to be managed as “restricted permit” or “limited entry” type hunts. That hunting strategy continued until 1989 when a “yearling only” regulation was initiated on the two largest elk herds, the Manti and Fishlake. Yearling only was later replaced with a “spike only” regulation and expanded to other units.

Elk herds in Utah are currently managed under a combination of general season (spike and any bull) and limited entry hunting regulations. The any bull units are located primarily in northern Utah and are generally on units with large amounts of private land, large wilderness areas, or units with very low elk populations. Spike hunting is used on most limited entry units and is intended to reduce bull:cow ratios, while still allowing for trophy quality bulls. Any bull and spike hunts are designed to provide hunting opportunity. In 2014, UDWR issued nearly 41,000 general season permits (14,300 any bull, 15,000 spike, and 11,500 archery). The harvest rate on those hunts is fairly low with success rates in 2014 averaging 17.0%, 13.4%, and 11.1% for the any bull, spike, and archery hunts respectively.

Limited entry hunting is managed for an average age of harvested bulls (Figure 1). Those age objectives are based on the premise that in order to achieve a given average age of harvest, a certain age structure must be present in the population. The higher the age class objective, the more the age structure will be shifted towards older animals, and as such, the greater the likelihood of a hunter harvesting a larger trophy animal. In general, over the past 5 years bulls in units that are managed for opportunity (4.5-5.0 or 5.5-6.0 years old) have exceeded the age objective and permits have been increased. Bulls in older age class units (6.5-7.0 and 7.5-8.0 years old) have been at or below the age objective and permits have been reduced. As a result, ages are trending upward on older age class units. From 2009 - 2014, that statewide average age for bull elk has been between 6.1 and 6.5 (Table 1).

C. Habitat

Elk are a generalist ungulate, and have a varied diet which consists of grasses, forbs, and shrubs. The percentage of each food type can vary based on availability. This flexible diet allows elk to live in a variety of habitat types including all of Utah’s mountains as well as some of the low deserts (Figure 2). Although elk inhabit most habitat types in Utah, they prefer to spend their summers at high elevations in aspen conifer forests. Elk will spend the winter months at mid to low elevation habitats that contain mountain shrub and sagebrush communities.

Elk in Utah are more closely tied to aspen than any other habitat type. Aspen stands provide both forage and cover for elk during the summer months and are used for calving in spring. For several decades, aspen has been declining throughout the West with overgrazing, lack of disturbance (e.g., logging, fire), and extended drought all being listed as potential reasons for the decline. If the declines in aspen continue, it will reduce the amount of potentially suitable habitat available for elk and, as such, reduce the number of elk those habitats can support.

Water is also an important component of elk habitat, and the lack of sufficient water distribution could limit the number of elk we can have in certain areas of Utah. In Utah, Jeffrey (1963) found that elk on summer range preferred areas within 0.33 miles of a permanent water source. Other studies have shown elk use of summer range declined markedly beyond 0.5 mile from water (Mackie 1970, Nelson and Burnell 1975).

D. Population Status

Elk are well established throughout Utah with the current statewide population estimated at approximately 81,000 animals (Figure 3). From 1975 to 1990, the elk population in Utah grew rapidly from an estimated 18,000 elk to 58,000 elk (average annual growth rate = 1.08). This rapid increase was largely due to low population levels and the abundance of available habitat (i.e., the population was well below carrying capacity). From 1990 to 2005, population growth slowed down considerably through the use of antlerless harvest designed to reduce population growth rates, as well as reduce populations in areas with poor range conditions due to drought. Although most elk populations are currently at or near the population objective (Table 2), elk populations have increased in many areas of the state due to increases in population objectives, difficulties with obtaining harvest on private lands that manage for elk, and movements of elk from tribal lands to public lands during winter. As such, this plan provides additional harvest strategies to obtain adequate harvest, in needed areas, on local units.

III. ISSUES AND CONCERNS

A. Habitat

Healthy and productive elk herds require high amounts of quality habitat. Crucial elk habitat is continually being fragmented or lost due to human expansion and development. Urbanization, road construction, OHV use, and energy development impact elk habitat, and proper planning and mitigation are essential to maintaining and improving elk habitat and migration routes. Additionally, elk summer ranges such as aspen habitat has been gradually replaced by conifers due to fire suppression, and winter ranges that were once dominated with shrubs and perennial grasses have been replaced by annual grasses or invasive weeds that are not beneficial to elk.

The UDWR has a long history of restoring and enhancing elk habitat in Utah. The habitat section, habitat council, watershed restoration initiative, and many conservation partners have provided leadership and funding to improve elk habitats. These projects have included pinyon-juniper removal, controlled burns, reseeding efforts after wildfires, conifer thinning, etc., which have allowed for increased perennial grasses, forbs, and shrubs to be established for the benefit of elk and other wildlife. Water catchments (i.e., guzzlers) and other developments have also been installed that benefit elk, cattle, and other big game species in Utah. Since 2005, UDWR and our partners have treated over 650,000 acres of elk habitat (350,000 acres of habitat improvement projects and 300,000 acres of fire rehabilitation). These efforts will continue to support elk populations throughout the state.

B. Population Size and Elk Distribution

The statewide elk management plan does not set a population objective for elk in Utah; rather, population objectives are established in unit plans and the summation of those objectives becomes the statewide objective. The current population objective for elk statewide is 70,965 (Table 2). Local committees or other forms of public input are used when changing a population objective for a given unit. Population estimates are obtained by conducting aerial surveys every 3 years as snow conditions and budgets allow. Population models include data on bull and cow harvest, survival, and calf production, are also used to estimate elk populations for a given unit and are updated annually.

Properly managing the distribution and number of elk within units is a key priority for UDWR. In most units, managing to a population objective is easily attained by issuing antlerless elk permits to public hunters. However, in some units, particularly those with large amounts of private or tribal lands, managing to the population objective has been challenging because elk quickly learn to use sanctuary or refuge areas that receive little hunting pressure during hunting seasons (Mangus 2009). Throughout this planning process, the statewide elk committee wanted to provide UDWR biologists as many management tools as possible to properly distribute elk and reach population objectives on individual units.

In addition to antlerless permits available through the public draw, antlerless elk control permits have been issued on units where the population objective is 0 or where elk harvest has been difficult to obtain. This strategy allows a hunter with a buck, bull, or once-in-a-lifetime permit to purchase a cow elk permit at a reduced price and harvest a cow within the season dates of their hunt in a specified boundary. Antlerless elk control permits have been successful because additional hunters are not added to the field, and it provides more hunting opportunities and increased harvest. Moving forward, additional strategies should be utilized on units that are over objective including increasing the number of cow elk permits a hunter can obtain annually, over-the-counter permits, and private-lands-only permits. These hunt strategies should provide hunting pressure and harvest in desired areas so elk can be better distributed throughout the unit. Also, private landowners can more easily harvest elk on their property, which may increase tolerance of elk in some areas.

C. Bull Hunting

This plan provides for opportunity and quality bull elk hunting in Utah. Opportunity hunts include spike and any bull elk permits and are needed to reduce bull to cow ratios. Harvesting bulls on these units allows for increased hunting opportunities and increased calf production in future years because more cows can be retained in the population. Spike hunting occurs on most limited entry units whereas any bull hunting occurs on units that are primarily dominated by private lands, units with low elk populations, wilderness areas or other large refuge areas such as tribal lands or national parks/monuments.

Limited entry hunts are designed for increased quality. On traditional limited entry units harvested bulls are managed to a desired age objective (Figure 1). The elk committee defined characteristics of lower age and higher age objective units and assigned all elk units to an age objective category (Table 1). In general, lower age objective units (4.5-5.0 and 5.5-6.0) have high populations of elk which allows for hunters to draw limited entry permits more frequently,

thus reducing point creep. These units also have high amounts of interchange with neighboring units, many roads, easy access to elk, and are in close proximity to urban areas. Higher age class objective units (6.5-7.0 and 7.5-8.0) have lower populations of elk, low amounts of interchange with neighboring units, few roads, difficult access to elk, and are in relatively remote parts of the state. The committee also considered other factors when assigning age objectives to units including point creep, management strategies of neighboring states and tribes, dynamics of private lands, and unit histories.

During the mid-plan review of 2020, underperforming and underutilized areas were identified at the direction of the Utah Wildlife Board and bulls on those units/areas will be hunted using a different strategy focused on primitive weapons to provide quality hunting experiences where hunters are likely to be less selective and have lower success due to the limited range of the allowed weapons. These primitive weapon limited entry units will utilize a September archery hunt followed by another primitive weapons hunt that allows the use of handgun, archery, muzzleloader, shotgun with no optical sights. These are defined in rule as HAMS hunts (R657-5-48) and are intended to provide increased limited entry hunting opportunities.

D. Poaching

Poaching is not considered to be a major problem in Utah; however, it is extremely difficult to determine the true extent to which elk are being poached in the state. Although poaching has not resulted in overall declines in elk population numbers in Utah, poaching of mature bulls can be significant and has reduced hunter opportunity in some localized areas. Units that are most susceptible to poaching typically have small isolated elk populations and issue very few bull elk permits. High grading of bulls may also be occurring on some units where hunters kill one bull elk and then abandon it to look for a larger bull. Continued law enforcement efforts are needed to maintain hunting opportunity.

E. Predator Management

Utah's elk populations have increased dramatically in Utah since 1970 even with presence of several predator species (e.g., mountain lion, black bear, and coyote). Although mountain lions may display strong patterns of selection for elk calves (Clark et al. 2014), along with black bears and coyotes occasionally preying on elk, there are no known instances of predators causing elk herd declines in Utah. Predator management occurs in some elk herd units due to declining or depressed mule deer populations on shared ranges, and also occurs when deer herds are chronically below population objectives (UDWR 2011a). In some instances, elk herds may have benefited by this predator management that was initiated for deer and other ungulate species.

Although wolves are not currently established in Utah, there is concern that wolves could impact elk populations and elk hunting opportunities. Recent studies in surrounding western states have implicated predation by wolves as a reason for localized elk herd declines, particularly in areas with poor to marginal habitat quality (Hamlin and Cunningham 2009). To deal with the potential establishment of wolves in Utah, UDWR in conjunction with the Wolf Working Group developed a wolf management plan that was passed by the Utah Wildlife Board in 2005 and was recently revised in 2014 (UDWR 2014).

F. Disease Issues

Similar to other wild ungulates, elk are susceptible to a wide variety of viral, bacterial, and parasitic diseases. In Utah, the two most concerning diseases include brucellosis (*Brucella abortus*) and chronic wasting disease (CWD). Other diseases and parasites either documented or considered a concern to elk include bluetongue virus (BTV), epizootic hemorrhagic disease (EHD), and elaeophora (*Elaeophora schneideri*).

Brucellosis is an infectious bacterial disease that causes late term abortions, non-viable calves, and sterility in adult cattle (Godfroid et al, 2011). Brucellosis can also infect humans (Godfroid et al., 2011). Transmission most commonly occurs when an animal licks or ingests infected fetal materials, aborted fetuses, uterine discharges, or contaminated feed or water (Godfroid et al., 2011). Depending on environmental conditions, such as cool temperatures and moisture, the bacteria can remain viable in uterine discharges and the aborted fetus for prolonged periods of time (Crawford et al. 1990). Brucellosis is thought to be self-limiting in free-ranging elk populations because of their secretive nature during parturition and the fact that most female elk quickly consume fetal materials after birth (Thorne 2001). However, this has not been the case for elk of the Greater Yellowstone area where feed ground practices that concentrate elk during the period when abortions are most likely have allowed the disease to persist and increase in prevalence (Thorne 2001). This finding has also been reported in Idaho, where the prevalence of brucellosis antibodies is two to four times higher in elk that use feed grounds (Etter and Drew 2006).

In the late 1960's, controversy began to surface in Utah regarding the status of brucellosis in elk. The origination of Utah elk from the Greater Yellowstone Area caused much concern in the agricultural community, given the findings of brucellosis in those herds in the early 1930's (Tunncliff and Marsh 1935). Moreover, the proximity and potential exchange of elk in Utah with possible brucellosis positive elk from Wyoming has also caused concern. In response, the UDWR has agreed to monitor the disease status of elk at Hardware Ranch on an annual basis and a trapping and testing program was initiated in 1969. Between 1969 and 1971, blood samples were collected from 101 elk, all of which were sero-negative for brucellosis (Follis 1972).

Serological testing of elk populations has continued on an annual basis in northern Utah and includes elk that use feed grounds on private property in Rich County, Hardware Ranch, and the Millville Face in Cache County. Further, hunter harvested antlerless elk from Rich and Cache County are tested through a voluntary participation program. To date, no elk in the state of Utah has ever been classified as a suspect or reactor (UDWR unpublished data).

CWD is a contagious, slow-acting, and fatal degenerative disease known to affect members of the cervid family including elk (Williams and Young 1982, Miller et al. 1998, Miller et al. 2000, Williams et al. 2002). Chronic Wasting Disease affects the central nervous system, resulting in weight loss, deterioration of body condition, and eventually death (Williams and Young 1982, Williams and Young 1992, Spraker et al. 1997, Williams et al. 2002). Chronic Wasting Disease was first documented in Utah in a hunter-harvested mule deer in late 2002 and has since then been found in three distinct geographic areas: the North Slope and South Slope Units near

Flaming Gorge and Brush Creek, the La Sal Mountains Unit, and the Central Mountains Unit near Fountain Green and the Spencer Fork Wildlife Management Area.

Surveillance for CWD in Utah includes hunter-harvest surveillance in areas known to have positive mule deer and targeted surveillance focusing on the removal of sick or symptomatic animals. To date, two elk have tested positive for CWD in Utah; one hunter harvested elk from the La Sal Mountains in 2009, and one female elk with neurological symptoms that was euthanized by UDWR personnel in 2014 near Vernal. Further, CWD was documented in two captive elk ranches in Utah in 2014, one in the Southeastern Region, and one in the Northern Region. The elk ranch in the southeastern region was subsequently depopulated, and 38% of the elk on the ranch tested positive. Chronic Wasting Disease in captive cervid facilities are of great concern to the health of Utah's wild elk. Licensing and CWD surveillance on captive elk ranches is overseen by the Utah Department of Agriculture and Food (UDAF), but the responsibility for removal of wild cervids within the ranches lies with UDWR. Close collaboration with UDAF, and enforcement of existing regulations is critical to prevent the spread of CWD from captive elk ranches.

G. Access Management

The use of off highway vehicles (OHVs) in Utah has dramatically increased in recent years. OHV registrations increased more than 3-fold from 1998 to 2006 (from 51,686 to 172,231) and that trend continues to increase (Smith 2008). Uncontrolled use of OHVs can cause damage to elk habitat and disturbance to elk during critical phases of their life cycle. Shed antler gathering and the associated human disturbance on crucial winter ranges, especially with the use of OHVs, can cause undue stress on elk during a time when they must conserve energy. State and federal land management agencies are currently struggling with issues involving the use of OHVs on public land. Those agencies acknowledge OHVs as a legitimate use of public land, but also recognize the potential problems associated with uncontrolled activity. As such, these agencies have developed or are currently working on travel management plans to help minimize the impact of OHVs on wildlife and their habitat.

H. Depredation Issues

Depredation of private croplands continues to exist in some areas despite careful management of elk populations. In some localized areas depredation can be a significant problem. UDWR has committed substantial resources to address depredation concerns, and there are numerous programs designed to assist land owners with depredation situations. Harvesting elk on private lands can ease frustrations of private landowners and better distribute elk into more favorable portions of a unit. Depredation problems need to be addressed within the sideboards of state code, rule, and policy, and in a timely and efficient manner so that landowners will better tolerate migratory populations of elk.

I. Private Land/ CWMU Issues

The value of private lands to the elk population cannot be overstated. Many crucial elk habitats throughout the state are privately owned, and some of those private rangelands have been

converted to housing developments, recreational properties, or other uses that result in a loss of elk habitat. As such, programs that provide incentives for private landowners to manage their properties to benefit elk and other wildlife species are essential to the success of the state's elk management program (e.g. CWMU, Landowner Association, and Walk-In Access programs). In some areas of the state, obtaining adequate cow harvest on private lands has been challenging, and reviewing current incentive programs and additional management options (e.g. private-lands-only permits, over-the-counter permits) will be necessary as elk management challenges continue to evolve. Additionally, the Utah Watershed Restoration Initiative has worked with numerous cooperating landowners to provide funding and other resources to accomplish vegetation treatments on both private and public lands to benefit elk and other wildlife species, as well as livestock.

J. Winter Feeding

Supplemental feeding is often viewed by the public as a viable solution to a lack of suitable winter range. However, there is evidence that the potential harm created by feeding elk may outweigh the limited benefits (WAFWA 2013). Winter feeding programs are generally costly and can cause problems for elk including behavioral changes, range destruction, and expansion of disease problems. Recent research conducted in Utah has shown that elk feeding programs in Utah can be reduced or eliminated without creating new problems (Mangus 2009).

Although there are negative consequences of winter feeding, it is also recognized that feeding may be necessary to sustain elk populations in emergency situations. It may also be necessary to temporarily feed elk to reduce depredation problems or to keep elk from impacting deer populations in extreme conditions. For instance, elk are fed at Hardware Ranch each winter to keep elk from moving on the urban interface. These elk are also physically examined, disease tested, and an outreach opportunity for the public to view and enjoy elk.

In Utah, winter feeding of big game is currently guided by the winter feeding policy (UDWR 2011*b*). Under this policy, feeding is discouraged except under extreme circumstances. With the discovery of CWD in Utah, the feeding policy was updated to state that “the Division will not participate in any emergency big game feeding program that occurs within the known range or use area of any big game population where CWD, brucellosis or tuberculosis has been detected.”

K. Competition

Competition occurs when two species use the same limited resource, and one of the two suffers in some way because of that use (WAFWA 2003). Competition can potentially take place between elk and other ungulates such as horses, livestock, or deer. Competition most often occurs where habitat is limited such as on crucial winter ranges or on the summer ranges of some drier units.

Concern has been expressed by some that elk populations are responsible for declines in deer herds over the past few decades. Direct competition is possible during a hard winter when forage is limited because elk can successfully shift to a diet largely comprised of browse, causing a high degree of diet overlap with mule deer (Frisina et al. 2008). Additionally indirect

competition, such as spatial and behavioral differences between elk and deer, may occur for fawning/calving habitats (Stewart et al. 2002). The extent of competition between elk and deer in Utah is unknown and that information is difficult to collect and quantify. Deer herd declines have occurred in areas with few or no elk, and deer herd increases have occurred in areas with large elk populations. Currently, elk and deer populations are thriving in Utah largely because of light winters and favorable amounts of precipitation during growing seasons.

There is also concern that elk and livestock compete for the same forage on shared ranges. Ranges where elk coexist with mule deer and livestock should be closely monitored to prevent over use and competition. Additionally, habitat improvement projects should be focused in those areas to reduce competition and improve range conditions for all species.

L. Research and Elk Movements

Understanding the movements of elk, factors that influence movements of elk, and potential barriers are needed to properly align management unit boundaries with biological groups of elk (Petersburg et al. 2000). Elk frequently move away from hunting pressure, which can make managing to a consistent population objective difficult in units with high amounts of migration. In southern Utah, individual elk that were radio-collared on the Mt Dutton unit have been observed on 4 neighboring units (UDWR unpublished data). This can cause concern for both biologists and hunters because elk on a given winter range may have been on a neighboring unit during the fall hunting seasons. As a result UDWR, BYU, and many conservation groups have provided direction and funding to conduct research on elk movements on the Wasatch and surrounding units. Additionally, information on body condition and survival estimates of elk will be collected, which will aid in population modeling efforts.

Increased knowledge of elk movements can also aid in reducing elk-vehicle collisions. DWR and our partners have worked to identify migration routes and locations where elk are commonly hit on roadways. This information has allowed us to know where to place underpasses and fences to increase elk survival. These studies have also provided data on the types of underpass structures these animals will use (Cramer 2014). Although costly, these efforts are helping to prevent future collisions, increase public safety, and minimize elk mortalities.

IV. USE AND DEMAND

Elk have become one of the most sought after big game animals in Utah. Geist (1998) in Deer of the World says the following of red deer, the elk of the old world:

“It adorns coats of arms, crests and monuments and is the deer of legends, poetry, and songs. Castles were built in its honor and to display its antlers, and throughout history its hunting and management generated passions that transcended life, death, and reason...”

Sportsmen are no less passionate about elk and elk hunting in Utah today. Hunter demand and interest for limited entry permits has always been high (Table 3). In 2014, a total of 53,334 hunters applied for 2,868 limited entry permits, resulting in 1:16.1 draw odds for residents and 1:43.4 for nonresidents. Draw odds have been relatively stable over the past 8 years when

comparing total hunters with permits available; however, some hunts have more favorable draw odds than others. For instance, nearly 60% of all limited entry elk hunters apply for the early season rifle hunt, resulting in added point creep for those hunts. Also, units managed for older age class bulls are more difficult to draw compared to lower age class units.

In addition to limited entry permits, Utah sold 40,807 general season elk permits for spike and any bull hunts in 2014. Although the number of general season elk permits has remained relatively constant over the past five years, the permits have been selling out earlier each year, indicating the demand for general season elk hunting in Utah.

Elk are also a high interest watchable wildlife species. Nearly everyone enjoys seeing and hearing elk in the wild. Units which produce large bulls are especially attractive not only to hunters but to wildlife watchers as well. Many thousands of hours and considerable money is expended each year in elk watching activities. For instance, 15,000 – 20,000 people attend Hardwar Ranch annually to view elk. As elk populations and habitats are properly managed, elk viewing and recreating activities will be enhanced for years to come.

VI. STATEWIDE MANAGEMENT GOALS AND OBJECTIVES

A. Population Management Goal: Improve management of Utah's elk populations.

Population Objective 1: Maintain healthy elk populations at biologically and socially sustainable levels.

Note: The statewide population objective is the sum of objectives contained in unit plans.

Strategies:

A. Elk Population Objectives

- a) Set population objectives and manage elk populations at appropriate spatial scales that account for migration patterns.
- b) Establish local advisory committees to review individual herd unit management plans when considering a change (increase or decrease) in the herd size objective.
 - i) Committees will be established following approval of the statewide elk plan.
 - ii) Committees will consist of the UDWR unit biologist and regional wildlife manager as facilitators, two local sportsman's representatives, and one representative from each of the following (if applicable): Farm Bureau, Cattlemen's Association, Wool Growers Association, Bureau of Land Management, USDA Forest Service, local elected official, RAC member, CWMU Association, Sportsmen for Fish and Wildlife, Mule Deer Foundation, Rocky Mountain Elk Foundation, tribal representative, local land owner or land owner association representative and other affected stakeholders. Recommendations from these committees will be reviewed by UDWR and presented to the Regional Advisory Councils and Wildlife Board for public input and approval.
 - iii) Committees shall be provided with the results of habitat projects completed in the previous five years, planned projects for the next three years, UDWR range trend data, and any other applicable information.
- c) On units where population decreases are necessary, UDWR will recommend short-term population objectives in unit management plans or increases in antlerless elk permits.

B. Population Management

- a) Utilize antlerless harvest as the primary tool to manage elk populations within herd size objectives and to target specific areas where range concerns or depredation problems exist.
- b) Properly manage elk populations to minimize competition with mule deer on crucial mule deer range.
- c) If drought related conditions and high elk densities are negatively impacting habitat, recommend additional antlerless elk permits at the August Wildlife Board meeting.
- d) During severe winters, aggressively use antlerless elk harvest (public hunters and DWR removal) to minimize conflicts.
- e) Consider using over-the-counter cow elk permits to provide additional harvest and hunting pressure in areas of conflict.

- f) On units over objective where cow harvest is difficult to obtain, allow for cow harvest using a general season muzzleloader bull elk permit (similar to general season archery elk hunt).
 - g) Encourage innovative ideas from regional biologists to manage towards population objectives.
- C. Monitoring Elk Populations and Elk Habitat
- a) Monitor all elk populations by helicopter survey on a three year rotational basis to evaluate herd size, calf production, herd composition, and habitat use, as conditions and budgets allow.
 - b) Evaluate herd size and population trends on an annual basis.
 - c) Implement research studies where needed to close information gaps.
 - d) Continue to support the interagency big game range trend study of crucial ranges throughout the state.
 - e) Monitor range condition, utilization, and trends annually as manpower and budget allow.
- D. Predator Control
- a) Utilize the Predator Management Policy where needed to help achieve objectives for elk populations, including the management of wolves if necessary.
- E. Disease Control
- a) Investigate and manage disease outbreaks that threaten elk populations including CWD and brucellosis.
 - b) Promote management practices that minimize disease risks such as discouraging baiting/feeding, conducting CWD surveillance, and assisting Department of Agricultural in monitoring elk farms/ranches for compliance.
 - c) Follow the emergency big game winter feeding policy, and avoid unnecessary feeding of elk.

Population Objective 2: Foster support among stakeholders for Utah's elk management program.

Strategies:

- A. Landowner Incentives
- a) Continue to provide incentive programs for landowners that will encourage elk populations on private land such as the CWMU, Landowner Association, and Walk-In Access programs.
 - b) Address all depredation problems in a timely and efficient manner to increase landowner tolerance of elk populations in accordance with current laws, rules, and policies.
- B. Habitat Acquisition and Restoration
- a) Identify and support the acquisition of property (fee title or conservation easements) from willing sellers that would better accommodate current population numbers or allow for increased elk populations.
 - b) Identify future habitat restoration projects with stakeholders.
 - c) Increase tolerance of public land grazers not enrolled in a CWMU or LOA by conducting habitat projects that will benefit livestock and wildlife.

C. Public Outreach and Enforcement

- a) Educate the public on the use and validity of population modeling in wildlife management.
- b) Increase communication and understanding between UDWR and stakeholders regarding elk distributions, population estimates, hunt recommendations, and management decisions.
- c) On units with high amounts of social conflict, create elk committees during unit plan revisions and/or hold open houses to obtain public input.
- d) Enforce existing laws that protect resources on public and private lands.

Population Objective 3: Achieve a proper distribution of elk on private and public lands.

Strategies:

A. Antlerless Permits

- a) Create a private-lands-only permit to encourage and target cow elk harvest on private lands.
- b) Increase the number of general season cow elk a hunter may annually harvest, but only allow for 1 cow elk permit to be obtained through the public draw system.
- c) Use depredation permits and vouchers, public hunters, and/or UDWR removal to harvest resident elk on agricultural lands or where elk are creating conflicts.
- d) Issue antlerless-elk-control permits on units that are over objective, in areas with limited access, units with low population objectives, or where hunter crowding is an issue.
- e) Coordinate season dates and permit numbers to distribute elk appropriately within a hunt unit and to achieve adequate harvest in areas of concern.

B. Landowner Assistance Programs

- a) Investigate an incentive program for landowners not enrolled in the CWMU or LOA programs to qualify for a special drawing for bull elk permits/vouchers based on cow harvest. This program should be used on units exceeding their population objective.
- b) Review and modify eligibility requirements for existing landowner incentive programs (LOA, CWMU, WIA) as needed to increase cow elk harvest and/or improve elk distribution during hunting seasons.
- c) Secure easements to increase hunter access to elk on public and private lands from willing participants.

B. Habitat Management Goal: Conserve and improve elk habitat throughout the state.

Habitat Objective 1: Maintain sufficient habitat to support elk herds at population objectives and reduce competition for forage between elk and livestock.

Strategies:

- A. Elk Habitat Classification and Assessment
 - a) Identify and characterize elk habitat throughout the state.
 - b) Provide information to educate counties, municipalities, and developers to promote zoning that benefits elk.
- B. Habitat Management
 - a) Coordinate with land management agencies and private landowners to properly manage and improve elk habitat, especially calving and wintering areas.
 - b) Work with state and federal land management agencies to use livestock as a management tool to enhance crucial elk ranges.
- C. Watershed Restoration Initiative
 - a) Increase forage production by annually treating a minimum of 40,000 acres of elk habitat.
 - b) Coordinate with land management agencies, conservation organizations, private landowners, and local leaders through the regional Watershed Restoration Initiative working groups to identify and prioritize elk habitats that are in need of enhancement or restoration.
 - i) Identify habitat projects on summer ranges (aspen communities) to improve calving habitat.
 - ii) Encourage land managers to manage portions of forests in early succession stages through the use controlled burning and logging. Controlled burning should only be used in areas with minimal invasive weed and/or safety concerns.
 - iii) Promote let-burn policies in appropriate areas that will benefit elk, and conduct reseeding efforts post wildlife.
- D. Habitat Acquisition
 - a) Acquire additional, important elk habitat from willing sellers to offset habitat loss.
 - b) Support programs, such as conservation easements, that provide incentives to private landowners to keep prime elk habitat managed as rangeland.
- E. Public Support
 - a) Educate the public on the value of the general license, conservation, and expo permits for funding elk habitat improvement projects.
 - b) Continue to support the conservation permit and habitat enhancement programs that provide crucial funding for habitat improvement efforts.

Habitat Objective 2: Reduce adverse impacts to elk herds and elk habitat.

Strategies:

- A. Road Management
 - a) Seek to maintain less than 2 miles of roads per square mile within crucial elk habitat.
 - b) Work cooperatively with UDOT, county, state, and federal agencies to limit the impacts of roads on elk.

- c) Support the establishment of multi-agency OHV plans developed on a county or planning unit level to prevent resource damage and protect crucial elk habitat.

B. Energy Development

- a) Coordinate with land management agencies and energy development proponents to develop an effective mitigation approach for oil, gas, and mining proposals and large scale developments (e.g., solar, wind, and recreation) which have the potential to impact crucial elk habitat.
- b) Encourage energy development companies to avoid and minimize the impact of disturbance and use Best Management Practices that promote the conservation of wildlife resources.

C. Noxious Weed Control

- a) Work with land management agencies and county weed boards to control the spread of noxious and invasive weeds throughout the range of elk in Utah.

C. Recreation Management Goal: Enhance recreational opportunities for hunting and viewing elk throughout the state.

Recreation Objective 1: Maintain a diversity of elk hunting opportunities.

Strategies

- A. Opportunity Emphasis - General Season Units
 - a) Provide the following statewide general season permits:
 - i) 15,000 spike bull permits. If harvest success is > 20% statewide, permits will be reduced to 14,000 the following year. Permits will be reinstated to 15,000 if harvest success is < 20% statewide.
 - ii) Unlimited any bull permits.
 - iii) Unlimited archery permits valid on both spike and any-bull units.
 - b) Allow for multi-season hunting opportunities on general elk units.
 - c) Continue to allow general season archery hunters to harvest a cow elk with their bull permit.
 - d) Provide hunting opportunities that will encourage youth participation and maintain family hunting traditions.
 - e) Seek opportunities to expand youth hunting on any-bull units.
- B. Quality Emphasis – Traditional and Primitive Weapons Limited Entry Units
 - a) Provide varied levels of limited entry elk hunting quality (Figure 1, Table 1).
 - i) Maintaining 4 categories of age class harvest objectives for traditional limited entry.
 - ii) Provide additional limited entry opportunity by having primitive weapon units/areas with September rut archery seasons followed by a HAMS seasons.
 - b) Accurately monitor the age of harvested bull elk by collecting a statistically valid sample of teeth from all seasons on all limited entry units. Provide incentives to encourage hunters to submit teeth or implement mandatory tooth submission if necessary.
 - c) Recommend traditional limited entry bull permits on each unit based on the 3-year average and trend of age data. Permit recommendations should make progress towards the age objective.
 - d) Recommend limited entry bull permits on primitive weapons units to increase opportunity while maintaining success rates in the range of traditional limited entry archery hunt 30%-50% (or while maintaining an average age of harvested bull elk in the 4.5-5 year range).
 - e) On traditional limited entry units permits for the 3 weapon types based on the following percentages: 25% for archery, 60% for rifle, and 15% for muzzleloader. On some units those percentages may vary to fulfill a management need.
 - f) On primitive weapon limited entry units allocate permits with 50% in the September archery hunt and 50% to the HAMS hunt.
 - g) On appropriate traditional limited entry units, provide a mid season (overlaps with general season spike hunt) and/or late season rifle elk hunt to increase hunting opportunity or improve hunter distribution.

- i) On these units, the percent of rifle permits in the early season rifle hunt will not exceed 60%, unless there is a management-related need.
 - h) On suitable traditional limited entry units, offer 3% of bull elk permits for multi-season hunting opportunities. These permits will be subtracted from the any weapon permit allocation.
- C. Hunting Access
- a) Continue to support programs that provide incentives for private landowners to manage for elk and elk habitat (e.g. CWMU, Landowner Association, and Walk-In Access programs).
 - b) Identify and support the acquisition of leveraged pieces of property (such as Wilcox Ranch and Book Cliffs Initiative) that control access to or management of larger tracts of public land for the purpose of increasing hunting and wildlife viewing opportunities.
 - c) Support the responsible use of OHV's in specified areas during hunting seasons.
 - d) Assist state and federal agencies with the development of travel management plans.
- D. Law Enforcement
- a) Direct law enforcement to reduce illegal activities.

Recreation Objective 2: Increase opportunities for viewing elk while educating the public concerning the needs of elk management and the importance of habitat.

- A. Education
- a) Use social media and other media outlets to promote interest and emphasize the importance of elk habitat and population management.
 - b) Promote public tours, elk viewing days, and spring range rides on crucial elk winter ranges to demonstrate the importance of elk habitat and population management.
- B. Partners
- a) Work with partners (conservation organizations, state and federal agencies, etc.) to increase outreach efforts that promote elk conservation, habitat, and management.
 - b) Highlight the importance of the conservation permit program, expo permits, watershed restoration initiative, and license and permits sales for funding efforts to improve elk habitat.

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Figure 1. Age objective units for elk units, 2020.

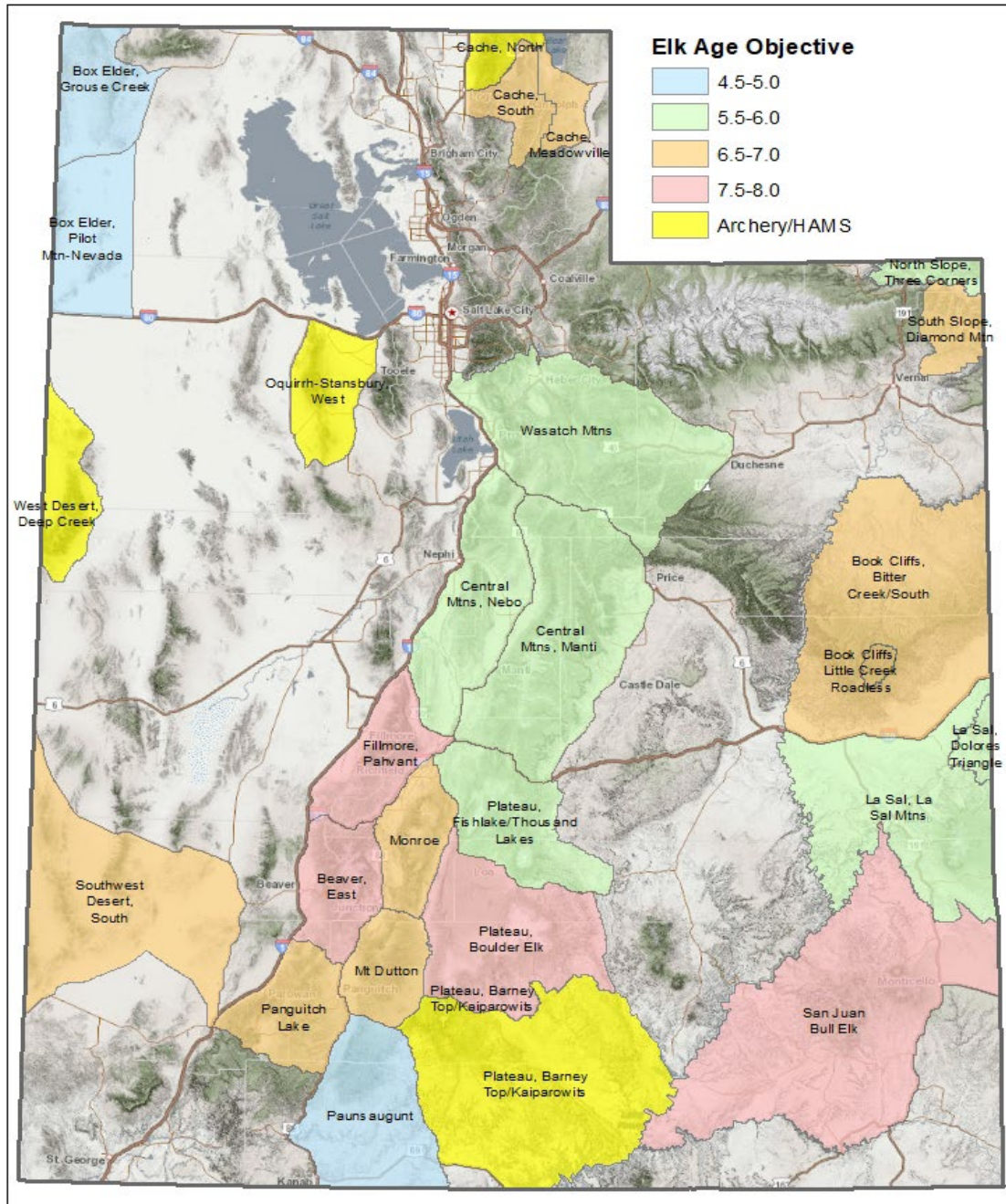


Figure 2. Elk habitat, Utah 2015.

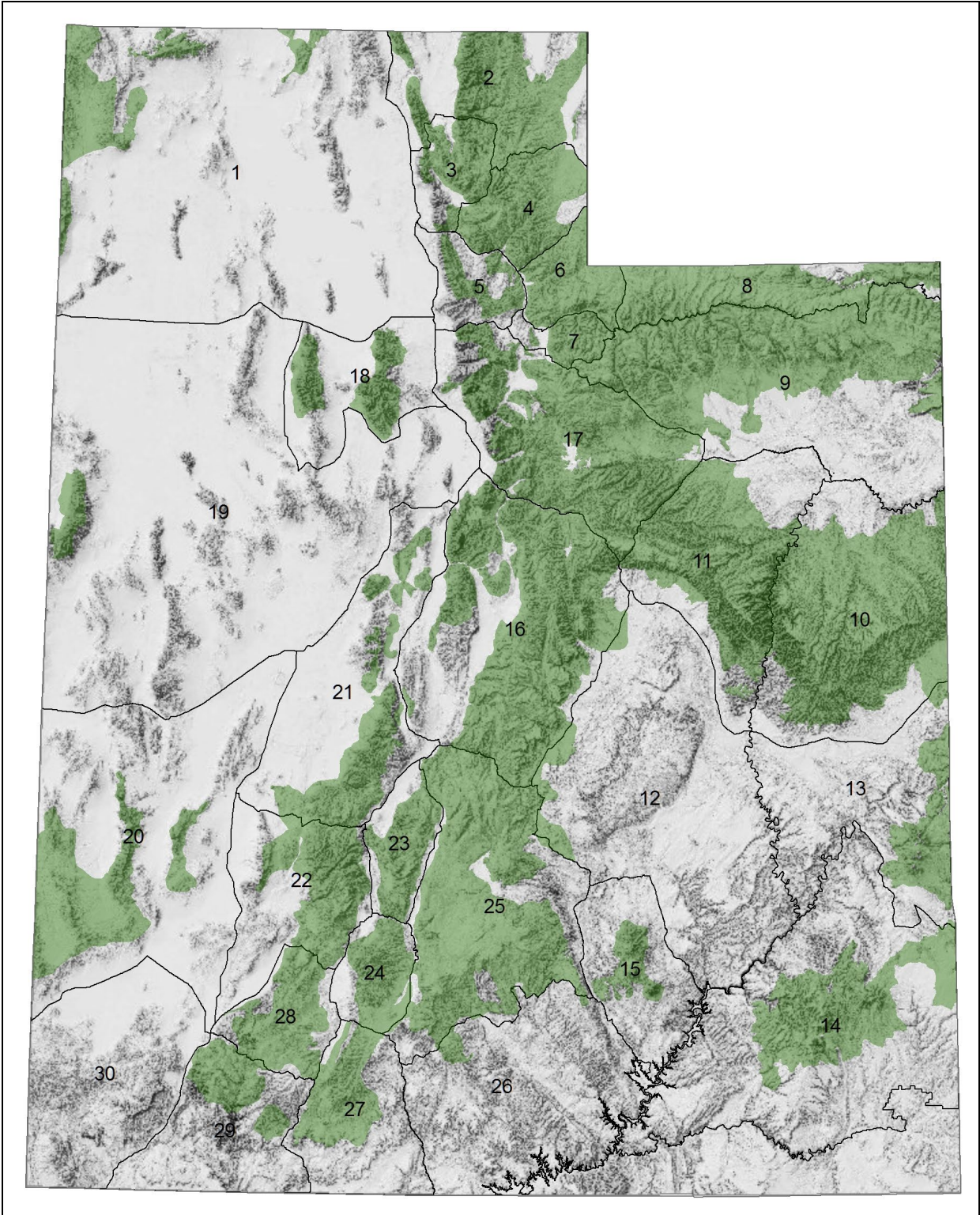


Figure 3. Statewide post-season elk population estimates, Utah 1975–2014.

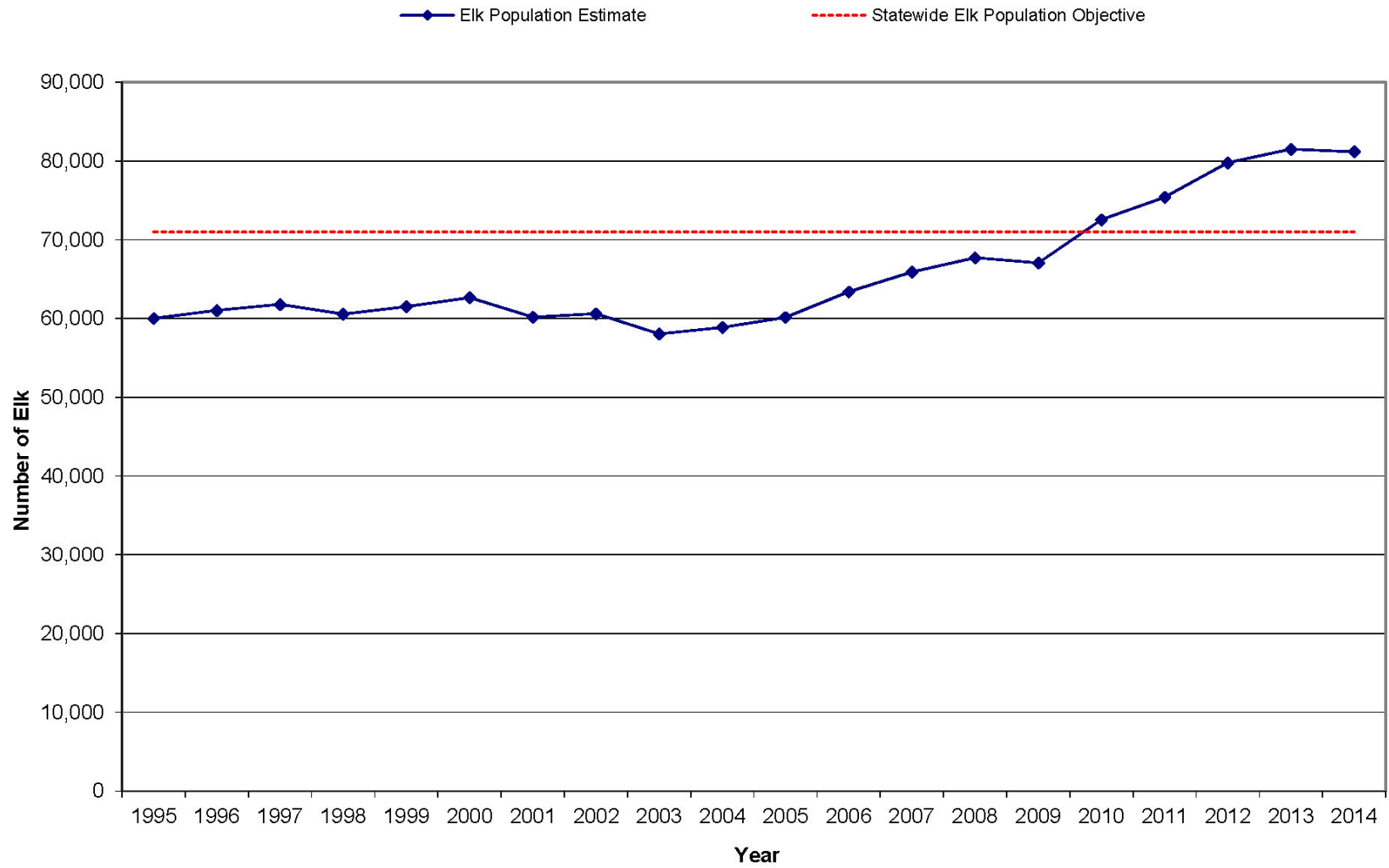


Table 1. Age objectives and average age of harvested bull elk by management unit, Utah 2011–2019.

Unit	2020 Age Objective	Year									3-year average
		2011	2012	2013	2014	2015	2016	2017	2018	2019	
Beaver	7.5-8.0	6.7	6.7	6.8	7.9	6.9	7.7	8.0	7.6	7.9	7.8
Book Cliffs, Bitter Creek/South	6.5-7.0	6.4	7.1	7.3	7.9	7.5	7.8	6.2	6.4	6.0	6.2
Book Cliffs, Little Creek**	6.5-7.0	6.6	7.1	7.3	7.9	7.5	7.3	7.1	7.0	7.0	7.0
Box Elder, Grouse Creek	4.5-5.0	4.8	6.3	5.2	5.3	5.5	5.7	5.2	6.0	5.5	5.6
Box Elder, Pilot Mountain*	4.5-5.0	5.3	6.5	—	6.7	6.5	6.1	6.7	5.3	7.7	6.5
Cache, Meadowville**	6.5-7.0	5.7	5.5	5.3	4.6	4.8	4.7	4.9	5.1	5.5	5.2
Cache, North	---	4.1	4.9	4.1	3.3	3.5	5.0	4.3	4.6	4.4	4.4
Cache, South*	6.5-7.0	5.8	5.9	5.8	5.4	5.5	4.7	5.0	5.7	5.9	5.5
Central Mountains, Manti	5.5-6.0	6.1	6.2	6.2	6.1	5.9	6.3	6.0	6.4	6.3	6.3
Central Mountains, Nebo**	5.5-6.0	6.1	5.8	6.2	5.6	6.0	5.3	5.8	5.8	5.7	5.8
Fillmore, Pahvant	7.5-8.0	6.9	6.9	7.3	7.6	7.8	8.1	7.9	7.6	6.5	7.3
La Sal, La Sal Mountains	5.5-6.0	6.7	6.0	6.8	6.5	6.6	6.3	5.7	5.9	5.7	5.8
Monroe*	6.5-7.0	6.0	6.6	6.6	7.1	7.8	7.8	6.4	6.7	7.3	6.8
Mount Dutton*	6.5-7.0	5.0	5.4	6.1	6.0	5.9	6.0	6.1	6.9	5.8	6.2
Nine Mile, Anthro	---	7.4	6.0	6.1	4.7	5.2	8.1	6.8	8.5	5.1	6.8
North Slope, Three Corners	5.5-6.0	6.0	6.0	6.3	5.9	5.7	5.4	5.0	4.7	6.0	5.2
Oquirrh-Stansbury	---	5.6	6.1	6.0	6.2	4.9	6.1	4.4	5.8	5.4	5.2
Panguitch Lake*	6.5-7.0	5.5	5.6	5.8	5.8	5.4	5.9	5.1	6.1	6.7	6.0
Paunsaugunt	4.5-5.0	4.9	4.9	6.5	5.3	4.9	4.8	4.5	4.8	4.8	4.7
Plateau, Boulder	7.5-8.0	7.4	7.4	7.6	7.9	7.3	8.2	7.3	8.2	7.5	7.7
Plateau, Fish Lake / 1000 Lake	5.5-6.0	6.1	6.1	6.3	5.9	6.0	6.0	6.0	5.9	6.0	6.0
San Juan	7.5-8.0	7.4	7.3	7.3	8.3	8.1	8.2	7.4	8.3	7.6	7.8
South Slope, Diamond Mountain	6.5-7.0	6.0	6.5	5.8	6.6	6.8	7.7	7.0	7.3	6.9	7.1
Southwest Desert, South	6.5-7.0	7.5	7.3	7.6	7.6	6.8	7.8	6.3	7.2	7.3	6.9
Wasatch Mountains	5.5-6.0	6.5	6.3	6.9	6.8	6.6	6.7	6.4	6.3	6.2	6.3
West Desert, Deep Creek*	7.5-8.0	7.5	6.5	7.2	6.8	5.9	7.2	6.4	5.4	5.8	5.9
Statewide average		6.1	6.3	6.5	6.4	6.2	6.6	6.1	6.3	6.2	6.2

**indicated a change in age objective from the original 2015 management plan

*indicates a change in age objective from the 2009 management plan.

Table 2. Elk herd population estimates and objectives by unit, Utah 2006–2014.

Unit	Population Objective	Year								
		2006	2007	2008	2009	2010	2011	2012	2013	2014
Beaver	1,050	875	850	800	850	1,100	1,100	1,150	1,175	1,100
Book Cliffs	7,500	3,900	4,500	4,650	4,100	4,200	4,270	4,000	4,800	5,500
Box Elder	675	380	400	425	425	500	550	700	700	700
Cache	2,300	2,050	1,750	2,200	2,350	2,350	2,400	2,500	2,200	2,300
Central Mountains, Manti	12,000	10,000	10,000	10,600	11,100	11,700	12,500	12,700	12,300	12,500
Central Mountains, Nebo	1,450	1,375	1,550	1,550	1,150	1,150	1,100	1,200	1,200	1,400
Chalk Creek	2,400	2,150	2,090	1,900	2,000	3,950	4,600	4,200	4,200	4,300
East Canyon	1,000	2,125	1,650	1,275	1,000	2,400	3,000	3,100	3,000	3,100
Fillmore	1,600	1,350	1,900	1,500	1,500	1,550	1,450	1,400	1,350	1,350
Henry Mountains	0	25	30	25	20	20	20	25	25	25
Kaiparowits	25	25	25	25	25	50	25	25	25	25
Kamas	850	600	570	600	800	1,100	1,100	1,175	1,100	1,000
La Sal	2,500	2,100	2,500	2,300	2,300	2,500	2,400	2,300	2,450	2,350
Monroe	1,800	1,000	1,000	1,050	1,200	1,300	1,400	1,400	1,300	1,250
Morgan-South Rich	3,500	4,500	3,800	4,400	3,800	3,500	5,000	5,000	5,000	4,100
Mt. Dutton	1,500	1,270	1,400	1,500	2,000	1,750	1,800	2,150	1,900	1,900
Nine Mile, Anthro	700	1,000	1,050	1,320	1,450	1,400	1,450	850	900	950
Nine Mile, Range Creek	1,600	2,100	2,100	2,180	2,100	1,700	1,700	1,700	1,550	1,400
North Slope, Summit	300	280	280	300	300	335	340	500	850	875
North Slope, Three Corners	500	1,075	830	800	650	550	550	400	600	600
North Slope, West Daggett	1,300	1,015	1,000	1,100	1,200	1,200	1,100	1,300	1,600	1,800
Ogden	800	700	780	780	620	650	600	600	2,000	2,100
Oquirrh-Stansbury	900	600	750	725	650	600	600	950	850	850
Panguitch Lake	1,100	870	950	1,000	800	775	850	1,000	1,100	1,100
Paunsaugunt	140	25	30	50	100	140	150	175	175	175
Pine Valley	50	50	50	50	50	50	50	50	50	75
Plateau, Boulder	1,500	500	900	1,500	1,800	1,500	1,350	1,600	1,700	1,700
Plateau, Fish Lake / Thousand Lakes	5,600	4,350	4,800	5,700	5,200	5,100	4,800	5,100	5,600	5,400
San Juan	1,300	1,100	1,400	1,400	1,200	1,600	1,500	1,300	1,100	1,200
San Rafael	0	30	20	30	60	60	60	25	25	20
South Slope, Vernal / Diamond Mountain	2,500	3,030	2,770	2,700	2,800	2,800	2,700	3,100	2,500	2,300
South Slope, Yellowstone	5,500	5,600	5,600	5,600	5,900	5,900	5,900	7,500	7,500	7,500
Southwest Desert, Indian Peaks	975	1,205	1,120	1,150	1,150	975	975	1,100	1,250	1,300
Wasatch Mountains, Avintaquin	1,600	1,250	1,300	1,400	1,400	1,950	1,900	1,750	1,900	1,900
Wasatch Mountains, Currant Creek	1,200	1,200	1,600	1,500	1,400	2,250	2,200	3,750	3,500	3,000
Wasatch Mountains, West	2,600	3,185	3,850	3,000	3,000	3,500	3,500	3,400	3,400	3,400
West Desert, Deep Creek	350	175	185	100	100	100	60	250	250	250
Zion	300	300	500	500	480	275	325	325	350	340

Statewide Totals	70,965	63,365	65,880	67,685	67,030	72,530	75,375	79,750	81,475	81,135
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Table 3. Drawing odds of obtaining a limited entry bull elk permit, Utah 1998–2014.

Year	Residents			Nonresidents		
	Applicants	Permits	Odds	Applicants	Permits	Odds
1998	21921	789	1 in 27.8	1931	60	1 in 32.2
1999	24146	831	1 in 29.1	2788	65	1 in 42.9
2000	27398	789	1 in 34.7	3278	63	1 in 52.0
2001	31068	831	1 in 37.4	4622	70	1 in 66.0
2002	34141	862	1 in 39.6	5539	76	1 in 72.9
2003	34707	978	1 in 35.5	6270	86	1 in 72.9
2004	38275	1272	1 in 30.1	8044	106	1 in 75.9
2005	39238	1533	1 in 25.6	9021	118	1 in 76.4
2006	40869	1805	1 in 22.6	9401	147	1 in 64.0
2007	43681	2065	1 in 21.2	10930	163	1 in 67.1
2008	41822	2352	1 in 17.8	8949	215	1 in 41.6
2009	40925	2526	1 in 16.2	10666	239	1 in 44.6
2010	41208	2743	1 in 15.0	10694	266	1 in 40.2
2011	38637	2767	1 in 14.0	10093	260	1 in 38.8
2012	38995	2586	1 in 15.1	10434	271	1 in 38.5
2013	40424	2552	1 in 15.8	10723	256	1 in 41.9
2014	42013	2607	1 in 16.1	11321	261	1 in 43.4

DB1523	South Slope, Yellowstone	9A	Aug. 21–Sept. 17	y
DB1524	Southwest Desert	20	Aug. 21–Sept. 17	y
DB1525	Wasatch Mtns, East	17B/17C	Aug. 21–Sept. 17	y
DB1526	Wasatch Mtns, West	17A	Aug. 21–Sept. 17	y
DB1527	West Desert, Tintic	19C	Aug. 21–Sept. 17	y
DB1528	West Desert, West	19A	Aug. 21–Sept. 17	y
DB1529	Zion	29	Aug. 21–Sept. 17	y

General Season Any Legal Weapon Hunts (early)

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1590	Chalk Creek/East Canyon/Morgan-South Rich	4/5/6	Oct. 13–Oct. 17	y
DB1591	Fillmore	21B	Oct. 13–Oct. 17	y
DB1592	Kamas	7	Oct. 13–Oct. 17	y
DB1593	Nine Mile	11	Oct. 13–Oct. 17	y
	North Slope	8	Oct. 13–Oct. 17	y
DB1594	Panguitch Lake	28	Oct. 13–Oct. 17	y
DB1595	Pine Valley	30	Oct. 13–Oct. 17	y
DB1596	Plateau, Fishlake	25A	Oct. 13–Oct. 17	y
DB1597	Zion	29	Oct. 13–Oct. 17	y

General Season Any Legal Weapon Hunts

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1530	Beaver	22	Oct. 23–Oct. 31	y
DB1531	Box Elder	1	Oct. 23–Oct. 31	y
DB1532	Cache	2	Oct. 23–Oct. 31	y
DB1533	Central Mtns, Manti/San Rafael	12/16B	Oct. 23–Oct. 31	y
DB1534	Central Mtns, Nebo	16A	Oct. 23–Oct. 31	y
DB1535	Chalk Creek/East Canyon/Morgan-South Rich	4/5/6	Oct. 23–Oct. 31	y
DB1536	Fillmore	21B	Oct. 23–Oct. 31	y
DB1538	Kamas	7	Oct. 23–Oct. 31	y
DB1539	La Sal, La Sal Mtns	13A	Oct. 23–Oct. 31	y
DB1540	Monroe	23	Oct. 23–Oct. 31	y
DB1541	Mt Dutton	24	Oct. 23–Oct. 31	y
DB1542	Nine Mile	11	Oct. 23–Oct. 31	y
DB1543	North Slope	8	Oct. 23–Oct. 31	y

DB1544	Ogden	3	Oct. 23–Oct. 31	y
DB1545	Oquirrh-Stansbury	18	Oct. 23–Oct. 31	y
DB1546	Panguitch Lake	28	Oct. 23–Oct. 31	y
DB1547	Pine Valley	30	Oct. 23–Oct. 31	y
DB1548	Plateau, Boulder/Kaiparowits	25C/26	Oct. 23–Oct. 31	y
DB1549	Plateau, Fishlake	25A	Oct. 23–Oct. 31	y
DB1550	Plateau, Thousand Lakes	25B	Oct. 23–Oct. 31	y
DB1551	San Juan, Abajo Mtns	14A	Oct. 23–Oct. 31	y
DB1552	South Slope, Bonanza/Vernal	9B/9D	Oct. 23–Oct. 31	y
DB1553	South Slope, Yellowstone	9A	Oct. 23–Oct. 31	y
DB1554	Southwest Desert	20	Oct. 23–Oct. 31	y
DB1555	Wasatch Mtns, East	17B/17C	Oct. 23–Oct. 31	y
DB1556	Wasatch Mtns, West	17A	Oct. 23–Oct. 31	y
DB1557	West Desert, Tintic	19C	Oct. 23–Oct. 31	y
DB1558	West Desert, West	19A	Oct. 23–Oct. 31	y
DB1559	Zion	29	Oct. 23–Oct. 31	y

General Season Muzzleloader Hunts

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1560	Beaver	22	Sept. 29–Oct. 7	y
DB1561	Box Elder	1	Sept. 29–Oct. 7	y
DB1562	Cache	2	Sept. 29–Oct. 7	y
DB1563	Central Mtns, Manti/San Rafael	12/16B	Sept. 29–Oct. 7	y
DB1564	Central Mtns, Nebo	16A	Sept. 29–Oct. 7	y
DB1565	Chalk Creek/East Canyon/Morgan-South Rich	4/5/6	Sept. 29–Oct. 7	y
DB1566	Fillmore	21B	Sept. 29–Oct. 7	y
DB1568	Kamas	7	Sept. 29–Oct. 7	y
DB1569	La Sal, La Sal Mtns	13A	Sept. 29–Oct. 7	y
DB1570	Monroe	23	Sept. 29–Oct. 7	y
DB1571	Mt Dutton	24	Sept. 29–Oct. 7	y
DB1572	Nine Mile	11	Sept. 29–Oct. 7	y
DB1573	North Slope	8	Sept. 29–Oct. 7	y
DB1574	Ogden	3	Sept. 29–Oct. 7	y
DB1575	Oquirrh-Stansbury	18	Sept. 29–Oct. 7	y
DB1576	Panguitch Lake	28	Sept. 29–Oct. 7	y
DB1577	Pine Valley	30	Sept. 29–Oct. 7	y

DB1578	Plateau, Boulder/Kaiparowits	25C/26	Sept. 29–Oct. 7	y
DB1579	Plateau, Fishlake	25A	Sept. 29–Oct. 7	y
DB1580	Plateau, Thousand Lakes	25B	Sept. 29–Oct. 7	y
DB1581	San Juan, Abajo Mtns	14A	Sept. 29–Oct. 7	y
DB1582	South Slope, Bonanza/Vernal	9B/9D	Sept. 29–Oct. 7	y
DB1583	South Slope, Yellowstone	9A	Sept. 29–Oct. 7	y
DB1584	Southwest Desert	20	Sept. 29–Oct. 7	y
DB1585	Wasatch Mtns, East	17B/17C	Sept. 29–Oct. 7	y
DB1586	Wasatch Mtns, West	17A	Sept. 29–Oct. 7	y
DB1587	West Desert, Tintic	19C	Sept. 29–Oct. 7	y
DB1588	West Desert, West	19A	Sept. 29–Oct. 7	y
DB1589	Zion	29	Sept. 29–Oct. 7	y

Premium Limited Entry Buck Deer

Premium Archery Hunts

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1000	Henry Mtns	15	Aug. 21–Sept. 17	y
DB1001	Paunsaugunt	27	Aug. 21–Sept. 17	y

Premium Any Legal Weapon Hunts

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1002	Antelope Island	1	Nov. 8–Nov. 18	n
DB1003	Henry Mtns	15	Oct. 23–Oct. 31	y
DB1004	Paunsaugunt	27	Oct. 23–Oct. 31	y

Premium Muzzleloader Hunts

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1005	Henry Mtns	15	Sept. 29–Oct. 7	y
DB1006	Paunsaugunt	27	Sept. 29–Oct. 7	y

Management Buck Hunt

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits

DB1009	Henry Mtns (any legal weapon)	15	Nov. 1–Nov. 5	n
DB1051	Henry Mtns (archery)	15	Aug. 28–Sept. 17	n
DB1052	Henry Mtns (muzzleloader)	15	Oct. 2–Oct. 7	n
DB1010	Paunsaugunt (any legal weapon)	27	Nov. 1–Nov. 5	y
DB1058	Paunsaugunt (cactus buck)	27	Nov. 6–Nov. 21	y
DB1073	Paunsaugunt (archery)	27	Aug. 28–Sept. 17	y
DB1074	Paunsaugunt (muzzleloader)	27	Oct. 2–Oct. 7	y
Multi-Season				
			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1007	Henry Mtns	15	All Limited Entry Seasons	n
DB1008	Paunsaugunt	27	All Limited Entry Seasons	n
Limited Entry Buck Deer				
Limited Entry Archery Hunts				
			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1011	Book Cliffs	10A/10B/10C	Aug. 21–Sept. 17	y
DB1012	Fillmore, Oak Creek LE	21A	Aug. 21–Sept. 17	y
DB1013	La Sal, Dolores Triangle	13B	Nov. 6–Nov. 19	n
DB1014	San Juan, Elk Ridge	14B	Aug. 21–Sept. 17	y
DB1015	South Slope, Diamond Mtn	9C	Aug. 21–Sept. 17	y
DB1016	West Desert, Vernon	19B	Aug. 21–Sept. 17	y
Limited Entry Any Legal Weapon Hunts				
			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1017	Book Cliffs, North	10A/10C	Oct. 23–Oct. 31	y
DB1018	Book Cliffs, South	10B	Oct. 23–Oct. 31	y
DB1019	Fillmore, Oak Creek LE	21A	Oct. 23–Oct. 31	y
DB1020	La Sal, Dolores Triangle	13B	Nov. 20–Nov. 28	y
DB1021	North Slope, Summit	8A	Oct. 9–Oct. 21	y
DB1022	San Juan, Elk Ridge	14B	Oct. 23–Oct. 31	y
DB1023	South Slope, Diamond Mtn	9C	Oct. 23–Oct. 31	y

DB1024	West Desert, Vernon	19B	Oct. 23–Oct. 31	y
Limited Entry Muzzleloader Hunts				
			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1025	Book Cliffs	10A/10B/10C	Sept. 29–Oct. 7	y
DB1026	Cache, Crawford Mtn	2D	Nov. 13–Nov. 28	y
DB1029	Fillmore, Oak Creek LE	21A	Sept. 29–Oct. 7	y
DB1031	La Sal, Dolores Triangle	13B	Dec. 1–Dec. 9	n
DB1037	San Juan, Elk Ridge	14B	Sept. 29–Oct. 7	y
DB1038	South Slope, Diamond Mtn	9C	Sept. 29–Oct. 7	y
DB1042	West Desert, Vernon	19B	Sept. 29–Oct. 7	y
Multi-Season				
			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1044	Book Cliffs	10A/10B/10C	All Limited Entry Seasons	y
DB1045	Fillmore, Oak Creek LE	21A	All Limited Entry Seasons	n
DB1046	San Juan, Elk Ridge	14B	All Limited Entry Seasons	n
DB1047	South Slope, Diamond Mtn	9C	All Limited Entry Seasons	n
DB1048	West Desert, Vernon	19B	All Limited Entry Seasons	y
Limited Entry Late Season Muzzleloader				
			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1059	Beaver	22	Nov. 3–Nov. 11	y
DB1077	Box Elder	1	Nov. 3–Nov. 11	y
DB1078	Cache	2	Nov. 3–Nov. 11	y
DB1079	Central Mtns, Manti/San Rafael	12/16B	Nov. 3–Nov. 11	y
DB1080	Central Mtns, Nebo	16A	Nov. 3–Nov. 11	y
DB1027	Chalk Creek/East Canyon/Morgan-South Rich	4/5/6	Nov. 3–Nov. 11	y
DB1028	Fillmore	21B	Nov. 3–Nov. 11	y
DB1030	Kamas	7	Nov. 3–Nov. 11	y
DB1081	La Sal, La Sal Mtns	13A	Nov. 3–Nov. 11	y
DB1032	Monroe	23	Nov. 3–Nov. 11	y
DB1053	Mt Dutton	24	Nov. 3–Nov. 11	y
DB1033	Nine Mile	11	Nov. 3–Nov. 11	y

DB1065	North Slope	8	Nov. 3–Nov. 11	y
DB1054	Ogden	3	Nov. 3–Nov. 11	y
DB1082	Oquirrh-Stansbury	18	Nov. 3–Nov. 11	y
DB1083	Panguitch Lake	28	Nov. 3–Nov. 11	y
DB1034	Pine Valley	30	Nov. 3–Nov. 11	y
DB1084	Plateau, Boulder/Kaiparowits	25C/26	Nov. 3–Nov. 11	y
DB1055	Plateau, Fishlake	25A	Nov. 3–Nov. 11	y
DB1036	Plateau, Thousand Lakes	25B	Nov. 3–Nov. 11	y
DB1085	San Juan, Abajo Mtns	14A	Nov. 3–Nov. 11	y
DB1086	South Slope, Bonanza/Vernal	9B/9D	Nov. 3–Nov. 11	y
DB1039	South Slope, Yellowstone	9A	Nov. 3–Nov. 11	y
DB1040	Southwest Desert	20	Nov. 3–Nov. 11	y
DB1041	Wasatch Mtns, East	17B/17C	Nov. 3–Nov. 11	y
DB1087	Wasatch Mtns, West	17A	Nov. 3–Nov. 11	y
DB1088	West Desert, Tintic	19C	Nov. 3–Nov. 11	y
DB1089	West Desert, West	19A	Nov. 3–Nov. 11	y
DB1043	Zion	29	Nov. 3–Nov. 11	y

Limited Entry Late Season HAMS

			2021	2021
Hunt #	Hunt Name	Unit #	Season Dates	Nonres Permits
DB1090	Book Cliffs, Floy Canyon	10	Nov. 13–Nov. 28	y
DB1091	Kaiparowits	26	Nov. 13–Nov. 28	y
DB1092	Morgan-South Rich	4	Nov. 13–Nov. 28	y

(y) At least one nonresident permit in 2021

(n) No nonresident permit in 2021

NOTE: Permit numbers will be determined in May 2021

			Key	Recommended Boundary Change
The 2021 DWR General Season Elk Dates Recommendation				Recommended Date Change
Archery Spike Bull		Aug. 21–Sept. 10	EB1005	Recommended Discontinue
Archery Any Bull		Aug. 21–Sept. 17		New Hunt
			Any Bull	
Muzzleloader		Nov. 3–Nov 11	EB1002	
Any Legal Weapon		Oct. 9–Oct. 21	EB1001	
Extended Archery Elk			Spike Only	
Uintah Basin		Aug. 21–Dec. 15	EB1004	
Wasatch Front		Aug. 21–Dec. 15	EB1003	
West Cache		Aug. 21–Dec. 15		
Limited Entry Bull Elk				
Archery Hunts				
Hunt #	Hunt Name	2021 Season Dates	2021 Nonres Permits	
EB3000	Beaver, East	Aug. 21–Sept. 17	y	
EB3001	Book Cliffs, Bitter Creek/South	Aug. 21–Sept. 17	y	
EB3002	Book Cliffs, Little Creek Roadless	Aug. 21–Sept. 17	y	
	Box Elder, Pilot Mtn	Aug. 21–Sept. 10	n	
EB3003	Cache, Meadowville†	Aug. 21–Sept. 17	y	
EB3004	Cache, North	Aug. 21–Sept. 17	y	
EB3005	Cache, South	Aug. 21–Sept. 17	y	
EB3006	Central Mtns, Manti	Aug. 21–Sept. 17	y	
EB3007	Central Mtns, Nebo	Aug. 21–Sept. 17	y	
EB3008	Fillmore, Pahvant	Aug. 21–Sept. 17	y	
EB3009	La Sal, La Sal Mtns	Aug. 21–Sept. 17	y	
EB3010	Monroe	Aug. 21–Sept. 17	y	
EB3011	Mt Dutton	Aug. 21–Sept. 17	y	
EB3012	Nine Mile, Anthro	Aug. 21–Sept. 17	y	
EB3013	North Slope, Three Corners	Aug. 21–Sept. 17	y	
EB3014	Oquirrh-Stansbury	Aug. 21–Sept. 17	y	
EB3015	Panguitch Lake	Aug. 21–Sept. 17	y	
EB3016	Paunsaugunt	Aug. 21–Sept. 17	y	
	Plateau, Boulder	Aug. 21–Sept. 17	y	
EB3018	Plateau, Fishlake/Thousand Lakes	Aug. 21–Sept. 17	y	
EB3019	San Juan Bull Elk	Aug. 21–Sept. 17	y	
EB3020	South Slope, Diamond Mtn	Aug. 21–Sept. 17	y	

	Southwest Desert, South	Aug. 21–Sept. 17	y
EB3022	Wasatch Mtns	Aug. 21–Sept. 17	y
EB3023	West Desert, Deep Creek	Aug. 21–Sept. 17	y
Any legal weapon hunts (early rifle)			
		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
EB3024	Beaver, East	Sept. 18–Sept. 26	y
EB3026	Book Cliffs, Bitter Creek/South	Sept. 18–Sept. 26	y
EB3028	Book Cliffs, Little Creek Roadless	Sept. 18–Sept. 26	y
	Box Elder, Grouse Creek	Sept. 18–Sept. 26	y
EB3031	Box Elder, Pilot Mtn	Sept. 11–Oct. 2	y
EB3032	Cache, Meadowville†	Sept. 18–Sept. 26	y
EB3034	Cache, North	Sept. 18–Sept. 26	y
EB3036	Cache, South	Sept. 18–Sept. 26	y
EB3038	Central Mtns, Manti	Sept. 18–Sept. 26	y
EB3040	Central Mtns, Nebo	Sept. 18–Sept. 26	y
EB3042	Fillmore, Pahvant	Sept. 18–Sept. 26	y
EB3045	La Sal, La Sal Mtns	Sept. 18–Sept. 26	y
EB3047	Monroe	Sept. 18–Sept. 26	y
EB3049	Mt Dutton	Sept. 18–Sept. 26	y
EB3051	Nine Mile, Anthro	Sept. 18–Sept. 26	y
EB3054	Oquirrh-Stansbury	Sept. 18–Sept. 26	y
EB3056	Panguitch Lake	Sept. 18–Sept. 26	y
EB3058	Paunsaugunt	Sept. 18–Sept. 26	y
	Plateau, Boulder	Sept. 18–Sept. 26	y
EB3063	Plateau, Fishlake/Thousand Lakes	Sept. 18–Sept. 26	y
EB3066	San Juan Bull Elk	Sept. 18–Sept. 26	y
EB3068	South Slope, Diamond Mtn	Sept. 18–Sept. 26	y
	Southwest Desert, South	Sept. 18–Sept. 26	y
EB3072	Wasatch Mtns	Sept. 18–Sept. 26	y
EB3074	West Desert, Deep Creek	Sept. 18–Sept. 26	y
Any legal weapon hunts (mid rifle)			
		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
	Box Elder, Grouse Creek	Oct. 9–Oct. 21	y
EB3126	Central Mtns, Manti	Oct. 9–Oct. 21	y

EB3053	North Slope, Three Corners	Oct. 9–Oct. 21	y
EB3059	Paunsaugunt	Oct. 9–Oct. 21	y
EB3064	Plateau, Fishlake/Thousand Lakes	Oct. 9–Oct. 21	y
EB3069	South Slope, Diamond Mtn	Oct. 9–Oct. 21	y
EB3127	Wasatch Mtns	Oct. 9–Oct. 21	y
EB3075	West Desert, Deep Creek	Oct. 9–Oct. 21	n

Any legal weapon hunts (late rifle)

		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
EB3025	Beaver, East	Nov. 13–Nov. 21	y
EB3027	Book Cliffs, Bitter Creek/South	Nov. 13–Nov. 21	y
EB3033	Cache, Meadowville†	Nov. 13–Nov. 21	y
EB3035	Cache, North	Nov. 13–Nov. 21	y
EB3037	Cache, South	Nov. 13–Nov. 21	y
EB3039	Central Mtns, Manti	Nov. 13–Nov. 21	y
EB3041	Central Mtns, Nebo	Nov. 13–Nov. 21	y
EB3043	Fillmore, Pahvant	Nov. 13–Nov. 21	y
EB3044	La Sal, Dolores Triangle	Dec. 11, 2021–Jan. 31, 2022	n
EB3046	La Sal, La Sal Mtns	Nov. 13–Nov. 21	y
EB3048	Monroe	Nov. 13–Nov. 21	y
EB3050	Mt Dutton	Nov. 13–Nov. 21	y
EB3052	Nine Mile, Anthro	Nov. 13–Nov. 21	y
EB3055	Oquirrh-Stansbury	Nov. 13–Nov. 21	n
EB3057	Panguitch Lake	Nov. 13–Nov. 21	y
EB3060	Paunsaugunt	Nov. 13–Nov. 21	y
	Plateau, Boulder	Nov. 13–Nov. 21	y
EB3065	Plateau, Fishlake/Thousand Lakes	Nov. 13–Nov. 21	y
EB3067	San Juan Bull Elk	Nov. 13–Nov. 21	y
	Southwest Desert, South	Nov. 13–Nov. 21	y
EB3073	Wasatch Mtns	Nov. 13–Nov. 21	y
EB3076	West Desert, Deep Creek	Nov. 13–Nov. 21	n

Muzzleloader Hunts

		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
EB3077	Beaver, East	Sept. 27–Oct. 8	y
EB3078	Book Cliffs, Bitter Creek/South	Sept. 27–Oct. 8	y

EB3079	Book Cliffs, Little Creek Roadless	Sept. 27–Oct. 8	n
	Box Elder, Grouse Creek	Sept. 27–Oct. 8	y
EB3081	Cache, Meadowville†	Sept. 27–Oct. 8	y
EB3082	Cache, North	Sept. 27–Oct. 8	n
EB3083	Cache, South	Sept. 27–Oct. 8	y
EB3084	Central Mtns, Manti	Sept. 27–Oct. 8	y
EB3085	Central Mtns, Nebo	Sept. 27–Oct. 8	y
EB3086	Fillmore, Pahvant	Sept. 27–Oct. 8	y
EB3087	La Sal, La Sal Mtns	Sept. 27–Oct. 8	y
EB3088	Monroe	Sept. 27–Oct. 8	y
EB3089	Mt Dutton	Sept. 27–Oct. 8	y
EB3090	Nine Mile, Anthro	Sept. 27–Oct. 8	y
EB3091	North Slope, Three Corners	Nov. 3–Nov. 11	n
EB3092	Oquirrh-Stansbury	Sept. 27–Oct. 8	n
EB3093	Panguitch Lake	Sept. 27–Oct. 8	y
EB3094	Paunsaugunt	Sept. 27–Oct. 8	y
	Plateau, Boulder	Sept. 27–Oct. 8	y
EB3096	Plateau, Fishlake/Thousand Lakes	Sept. 27–Oct. 8	y
EB3097	San Juan Bull Elk	Sept. 27–Oct. 8	y
EB3098	South Slope, Diamond Mtn	Sept. 27–Oct. 8	y
	Southwest Desert, South	Sept. 27–Oct. 8	y
EB3100	Wasatch Mtns	Sept. 27–Oct. 8	y
EB3101	West Desert, Deep Creek	Sept. 27–Oct. 8	n
Multi-Season			
		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
EB3102	Beaver, East	All Limited Entry Seasons	n
EB3103	Book Cliffs, Bitter Creek/South	All Limited Entry Seasons	n
EB3104	Book Cliffs, Little Creek Roadless	All Limited Entry Seasons	n
EB3105	Cache, Meadowville†	All Limited Entry Seasons	n
EB3106	Cache, North	All Limited Entry Seasons	n
EB3107	Cache, South	All Limited Entry Seasons	n
EB3108	Central Mtns, Manti	All Limited Entry Seasons	y
EB3109	Central Mtns, Nebo	All Limited Entry Seasons	n
EB3110	Fillmore, Pahvant	All Limited Entry Seasons	n
EB3111	La Sal, La Sal Mtns	All Limited Entry Seasons	n
EB3112	Monroe	All Limited Entry Seasons	n

EB3113	Mt Dutton	All Limited Entry Seasons	n
EB3114	Nine Mile, Anthro	All Limited Entry Seasons	n
EB3115	North Slope, Three Corners	All Limited Entry Seasons	n
EB3116	Oquirrh-Stansbury	All Limited Entry Seasons	n
EB3117	Panguitch Lake	All Limited Entry Seasons	n
EB3118	Paunsaugunt	All Limited Entry Seasons	n
	Plateau, Boulder	All Limited Entry Seasons	n
EB3120	Plateau, Fishlake/Thousand Lakes	All Limited Entry Seasons	y
EB3121	San Juan Bull Elk	All Limited Entry Seasons	n
EB3122	South Slope, Diamond Mtn	All Limited Entry Seasons	n
	Southwest Desert, South	All Limited Entry Seasons	n
EB3124	Wasatch Mtns	All Limited Entry Seasons	y
EB3125	West Desert, Deep Creek	All Limited Entry Seasons	n

September Archery

		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
	Cache, North	Sept. 1–Sept. 30	y
	Oquirrh-Stansbury, West	Sept. 1–Sept. 30	y
	Plateau, Barney Top/Kaiparowits	Sept. 1–Sept. 30	y
	West Desert, Deep Creek	Sept. 1–Sept. 30	y

HAMS Hunts

		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
	Cache, North	Oct. 1–Nov. 15	y
	Oquirrh-Stansbury, West	Oct. 1–Nov. 15	y
	Plateau, Barney Top/Kaiparowits	Oct. 1–Nov. 15	y
	West Desert, Deep Creek	Oct. 1–Nov. 15	y

Youth Any Bull Hunts

		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
EB1007	Youth General Any Bull Elk	Sept. 18–Sept. 26	y

†This unit is composed of all or largely private property. Hunters should acquire written permission from the landowner before applying for

(y) At least one nonresident permit in 2021

(n) No nonresident permit in 2021

	<u>NOTE: Permit numbers will be determined in May 2021</u>			

			Key	Recommended Boundary Change
ONCE IN A LIFETIME SPECIES				Recommended Date Change
				Recommended Discontinue
Bull Moose		2021	2021	New Hunt
Hunt #	Hunt Name	Season Dates	Nonres Permits	
MB6000	Cache	Sept. 18–Oct. 21	y	
MB6001	Chalk Creek†	Sept. 18–Oct. 21	n	
MB6002	East Canyon†	Sept. 18–Oct. 21	n	
MB6003	East Canyon, Morgan-Summit†	Sept. 18–Oct. 21	n	
MB6004	Kamas	Sept. 18–Oct. 21	n	
MB6005	Morgan-South Rich†	Sept. 18–Oct. 21	n	
MB6006	North Slope, Summit	Sept. 18–Oct. 21	y	
MB6007	North Slope, Three Corners/West Daggett	Sept. 18–Oct. 21	y	
MB6008	Ogden†	Sept. 18–Oct. 21	y	
MB6009	South Slope, Diamond Mtn/Vernal	Sept. 18–Oct. 21	n	
MB6010	South Slope, Yellowstone	Sept. 18–Oct. 21	n	
MB6011	Wasatch Mtns/Central Mtns	Sept. 18–Oct. 21	y	
†This unit is composed of all or largely private property. Hunters should acquire written permission from the landowner before a				
Bison		2021	2021	
Hunt #	Hunt Name	Season Dates	Nonres Permits	
BI6500	Antelope Island	Dec. 6–Dec. 8	n	
BI6521	Book Cliffs (archery, hunter's choice)	Aug. 21–Sept. 17	y	
BI6517	Book Cliffs (hunter's choice)	Sept. 18–Sept. 26	y	
BI6522	Book Cliffs, Bitter Creek/South (cow only)	Oct. 23–Nov. 2	y	
BI6523	Book Cliffs, Bitter Creek/South (hunter's choice)	Oct. 9–Oct. 21	y	
BI6520	Book Cliffs (cow only)	Nov. 20–Dec. 5	y	
BI6519	Book Cliffs, Little Creek Roadless (hunter's choice)	Oct. 9–Oct. 21	y	
BI6524	Book Cliffs, Little Creek Roadless (cow only)	Oct. 23–Nov. 2	y	
	Book Cliffs, Wild Horse Bench (hunter's choice)	Aug. 1, 2021–Jan. 31, 2022	y	
BI6509	Henry Mtns (archery, hunter's choice)	Sept. 11–Sept. 21	y	
BI6515	Henry Mtns (archery, cow only)	Oct. 9–Oct. 21	y	
BI6503	Henry Mtns (hunter's choice)	Nov. 6–Nov. 17	y	
BI6504	Henry Mtns (hunter's choice)	Nov. 20–Dec. 1	y	
BI6516	Henry Mtns (hunter's choice)	Dec. 4–Dec. 15	y	

BI6505	Henry Mtns (cow only)	Dec. 18–Dec. 29	y
BI6506	Henry Mtns (cow only)	Jan. 1, 2022–Jan. 17, 2022	y
Desert Bighorn Sheep		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
DS6600	Henry Mtns	Sept. 18–Nov. 10	n
DS6601	Kaiparowits, East*	Sept. 18–Nov. 10	y
DS6602	Kaiparowits, Escalante	Sept. 18–Nov. 10	n
DS6603	-	Sept. 18–Nov. 10	y
DS6604	La Sal, Potash/South Cisco	Sept. 18–Nov. 10	n
DS6620	Pine Valley, Virgin River	Oct. 30–Dec. 26	n
DS6621	Pine Valley, Beaver Dam	Oct. 30–Dec. 26	n
DS6606	San Juan, Lockhart	Sept. 18–Nov. 10	n
DS6622	San Juan, North	Sept. 18–Nov. 10	n
DS6623	San Juan, San Juan River	Sept. 18–Nov. 10	n
DS6607	San Juan, South	Sept. 18–Nov. 10	n
DS6609	San Rafael, North	Sept. 18–Nov. 10	n
DS6608	San Rafael, Dirty Devil§	Sept. 18–Nov. 10	y
DS6610	San Rafael, South†	Sept. 18–Nov. 10	y
DS6611	Zion^	Sept. 18–Oct. 15	y
DS6612	Zion	Oct. 16–Nov. 10	n
Archery Hunts		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
DS6619	Zion (archery)	Dec. 25, 2021–Jan. 16, 2022	n
*Nonresidents may only hunt the Kaiparowits East and Escalante subunits			
†Nonresidents may hunt both the San Rafael, North and San Rafael, South subunits			
^Nonresidents may hunt both the early and late season of the Zion unit			
§Nonresidents may hunt both the San Rafael, Dirty Devil and the Henry Mtns units			
Rocky Mountain Bighorn Sheep		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
RS6701	Book Cliffs, South	Oct. 30–Nov. 30	y
RS6703	Box Elder, Newfoundland Mtn	Oct. 9–Oct. 29	y
RS6704	Box Elder, Newfoundland Mtn	Oct. 30–Nov. 19	n
RS6702	Box Elder, Pilot Mtn	Sept. 1–Oct. 30?	n

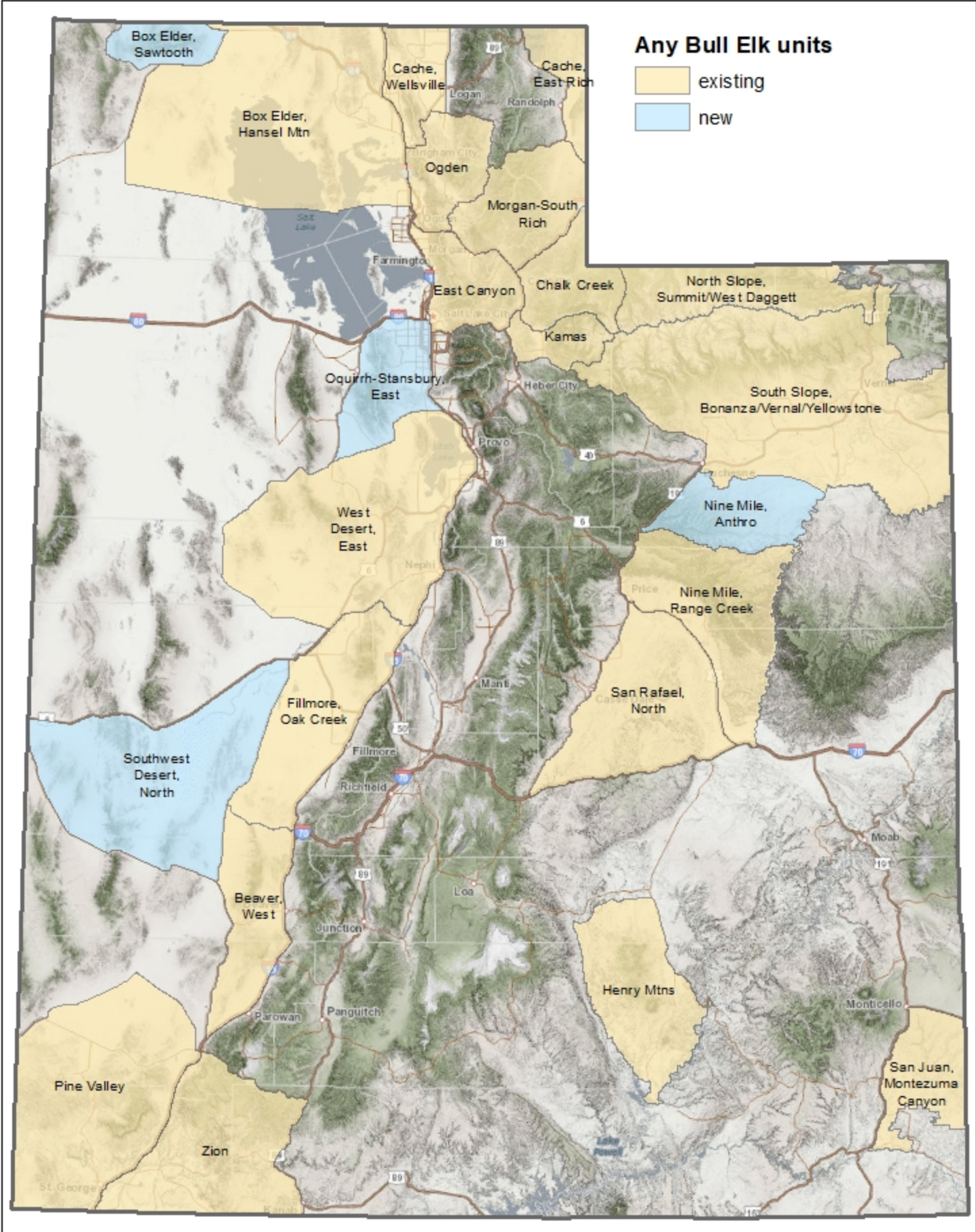
RS6724	Wasatch Mtns, West	Oct. 30–Nov. 30	n
RS6725	Central Mtns, Nebo	Oct. 30–Nov. 30	n
RS6720	Fillmore, Oak Creek	Oct. 9–Oct. 29	n
RS6726	Fillmore, Oak Creek	Oct. 30–Nov. 19	y
RS6712	Nine Mile, Gray Canyon	Oct. 30–Nov. 30	y
RS6713	Nine Mile, Jack Creek	Oct. 30–Nov. 30	n
RS6708	North Slope, Three Corners-Bare Top	Sept. 20–Nov. 30	n
RS6709	North Slope, Summit/West Daggett	Oct. 30–Nov. 30	n
RS6721	Oquirrh-Stansbury, West	Oct. 30–Nov. 30	n
Archery Hunts		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
RS6722	Box Elder, Newfoundland Mtn (archery)	Nov. 20–Dec. 12	n
	Fillmore, Oak Creek (archery)	Nov. 20–Dec. 12	n
Mountain Goat			
Any Legal Weapon Hunts		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
GO6800	Beaver	Sept. 11–Oct. 3	y
GO6801	Beaver	Oct. 4–Nov. 15	n
GO6803	Central Mtns, Nebo	Oct. 4–Nov. 30	y
GO6804	Chalk Creek/Kamas, Uintas	Sept. 11–Oct. 31	y
GO6817	La Sal, La Sal Mtns	Sept 11–Nov. 30	y
GO6814	Mt Dutton	Sept 11–Nov. 30	n
GO6805	North Slope/South Slope, High Uintas Central	Sept. 11–Oct. 31	y
GO6806	North Slope/South Slope, High Uintas East	Sept. 11–Oct. 31	n
GO6807	North Slope/South Slope, High Uintas Leidy Peak	Sept. 11–Oct. 31	n
GO6808	North Slope/South Slope, High Uintas West	Sept. 11–Oct. 31	y
GO6810	Ogden, Willard Peak	Sept. 11–Nov. 30	n
GO6818	Wasatch Mtns, Box Elder Peak	Sept. 11–Nov. 30	n
GO6819	Wasatch Mtns, Lone Peak	Sept. 11–Nov. 30	n
GO6813	Wasatch Mtns, Provo Peak	Sept. 11–Nov. 30	n
GO6820	Wasatch Mtns, Timpanogos	Sept. 11–Nov. 30	n
Archery Hunts		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits

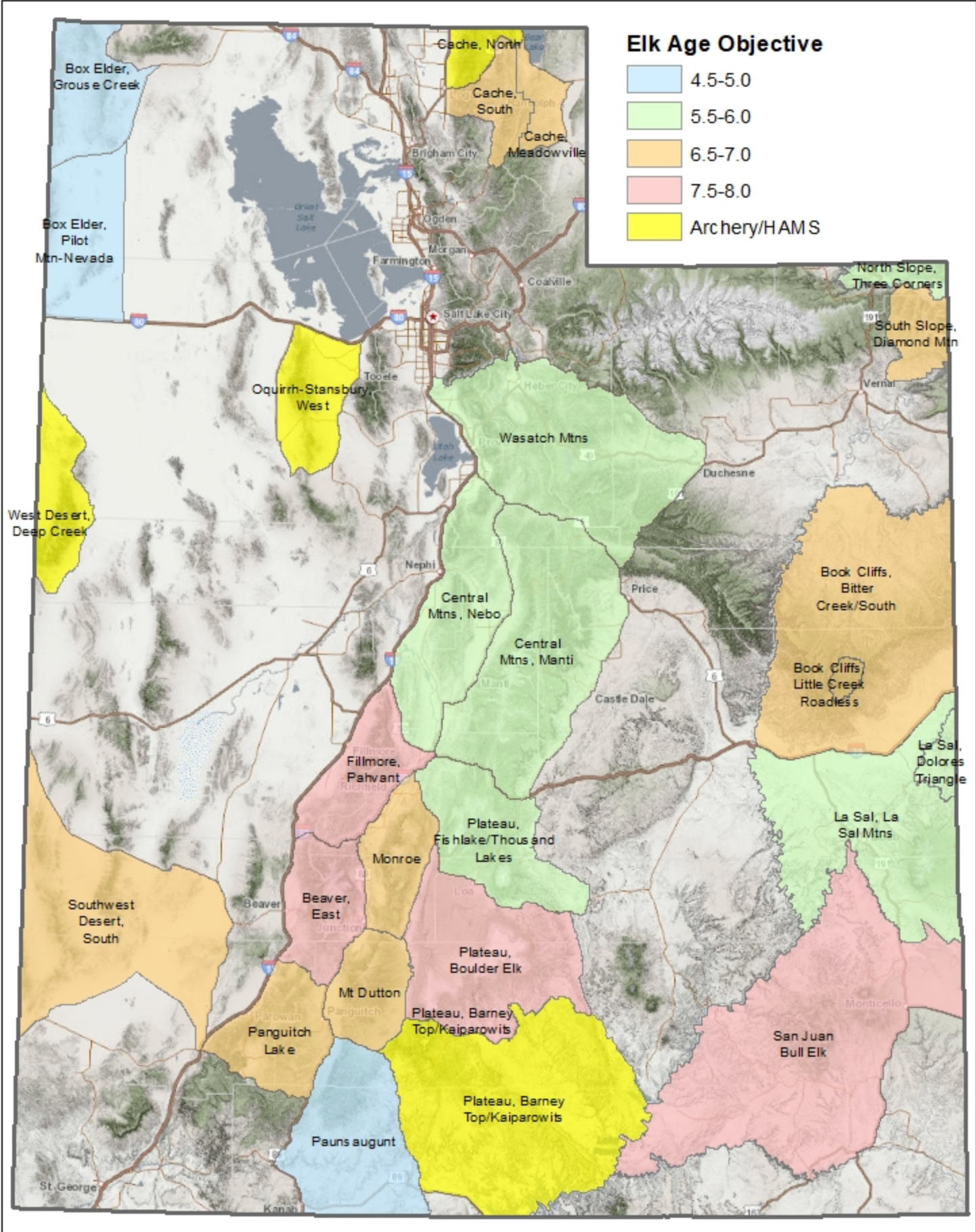
GO6815	North Slope/South Slope, High Uintas Central (archery)	Aug. 21–Sept. 10	n	
GO6821	Central Mtns, Nebo (archery)	Sept. 11–Oct. 3	y	
	(y) At least one nonresident permit in 2021			
	(n) No nonresident permit in 2021			
	<u>NOTE: Permit numbers will be determined in May 2021</u>			

Limited Entry Pronghorn			Key	Recommended Boundary Change
				Reccommended Date Change
Archery Hunts				Recommended Discontinue
		2021	2021	New Hunt
Hunt #	Hunt Name	Season Dates	Nonres Permits	
PB5000	Beaver	Aug. 21–Sept. 17	n	
PB5001	Book Cliffs, Bitter Creek	Aug. 21–Sept. 17	y	
PB5002	Book Cliffs, South	Aug. 21–Sept. 17	y	
PB5003	Box Elder, Promontory	Aug. 21–Sept. 17	n	
PB5004	Box Elder, Puddle Valley	Aug. 21–Sept. 17	y	
PB5005	Box Elder, Snowville	Aug. 21–Sept. 17	y	
PB5006	Box Elder, West	Aug. 21–Sept. 17	n	
PB5007	Cache/Morgan-South Rich/Ogden	Aug. 21–Sept. 17	y	
PB5008	Fillmore, Oak Creek South	Aug. 21–Sept. 17	y	
PB5009	La Sal, Potash/South Cisco	Aug. 21–Sept. 17	y	
PB5332	Mt Dutton/Paunsaugunt	Aug. 21–Sept. 17	y	
PB5011	Nine Mile, Anthro-Myton Bench	Aug. 21–Sept. 17	y	
PB5053	Nine Mile, Range Creek	Aug. 21–Sept. 17	n	
PB5012	North Slope, Three Corners/West Daggett	Aug. 21–Sept. 17	y	
PB5054	Panguitch Lake/Zion, North	Aug. 21–Sept. 17	y	
PB5013	Pine Valley	Aug. 21–Sept. 17	y	
	Plateau, Highlands	Aug. 21–Sept. 17	n	
PB5333	Plateau, Parker Mtn	Aug. 21–Sept. 17	y	
PB5058	San Juan, Hatch Point	Aug. 21–Sept. 17	n	
PB5055	San Rafael, Desert	Aug. 21–Sept. 17	n	
PB5015	San Rafael, North	Aug. 21–Sept. 17	y	
PB5016	South Slope, Bonanza/Diamond Mtn	Aug. 21–Sept. 17	y	
PB5017	South Slope, Vernal	Aug. 21–Sept. 17	y	
PB5018	Southwest Desert	Aug. 21–Sept. 17	y	

PB5019	West Desert, Riverbed	Aug. 21–Sept. 17	y
PB5020	West Desert, Rush Valley	Aug. 21–Sept. 17	y
PB5021	West Desert, Snake Valley	Aug. 21–Sept. 17	y
Muzzleloader hunts			
		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
PB5022	Cache/Morgan-South Rich/Ogden	Sept. 29–Oct. 7	y
	Fillmore, Oak Creek South	Sept. 29–Oct. 7	y
PB5059	Nine Mile, Anthro-Myton Bench	Sept. 29–Oct. 7	y
	North Slope, Three Corners/West Daggett	Sept. 29–Oct. 7	y
PB5061	Panguitch Lake/Zion, North	Sept. 29–Oct. 7	n
PB5062	Pine Valley	Sept. 29–Oct. 7	y
	Plateau, Highlands	Sept. 29–Oct. 7	n
PB5335	Plateau, Parker Mtn	Sept. 29–Oct. 7	y
PB5056	San Rafael, North	Sept. 29–Oct. 7	y
PB5060	South Slope, Bonanza/Diamond Mtn	Sept. 29–Oct. 7	y
PB5024	Southwest Desert	Sept. 29–Oct. 7	y
Any Legal Weapon Hunts			
		2021	2021
Hunt #	Hunt Name	Season Dates	Nonres Permits
PB5025	Beaver	Sept. 18–Sept. 26	y
PB5026	Book Cliffs, Bitter Creek	Sept. 18–Sept. 26	y
PB5027	Book Cliffs, South	Sept. 18–Sept. 26	y
PB5028	Box Elder, Promontory	Sept. 18–Sept. 26	y
PB5029	Box Elder, Puddle Valley	Sept. 18–Sept. 26	y
PB5030	Box Elder, Snowville	Sept. 18–Sept. 26	y
PB5031	Box Elder, West	Sept. 18–Sept. 26	y

PB5032	Cache/Morgan-South Rich/Ogden	Sept. 18–Sept. 26	y	
PB5033	Fillmore, Oak Creek South	Sept. 18–Sept. 26	y	
PB5034	Kaiparowits	Sept. 18–Sept. 26	n	
PB5035	La Sal, Potash/South Cisco	Sept. 18–Sept. 26	y	
PB5331	Mt Dutton/Paunsaugunt	Sept. 18–Sept. 26	y	
PB5037	Nine Mile, Anthro-Myton Bench	Sept. 18–Sept. 26	y	
PB5038	Nine Mile, Range Creek	Sept. 18–Sept. 26	y	
PB5039	North Slope, Summit	Sept. 18–Sept. 26	y	
PB5040	North Slope, Three Corners/West Daggett	Sept. 18–Sept. 26	y	
PB5041	Panguitch Lake/Zion, North	Sept. 18–Sept. 26	y	
PB5042	Pine Valley	Sept. 18–Sept. 26	y	
	Plateau, Highlands	Sept. 18–Sept. 26	n	
PB5334	Plateau, Parker Mtn	Sept. 18–Sept. 26	y	
PB5044	San Juan, Hatch Point	Sept. 18–Sept. 26	n	
PB5045	San Rafael, Desert	Sept. 18–Sept. 26	y	
PB5046	San Rafael, North	Sept. 18–Sept. 26	y	
PB5047	South Slope, Bonanza/Diamond Mtn	Sept. 18–Sept. 26	y	
PB5048	South Slope, Vernal	Sept. 18–Sept. 26	y	
PB5049	Southwest Desert	Sept. 18–Sept. 26	y	
PB5050	West Desert, Riverbed	Sept. 18–Sept. 26	y	
PB5051	West Desert, Rush Valley	Sept. 18–Sept. 26	y	
PB5052	West Desert, Snake Valley	Sept. 18–Sept. 26	y	
	(y) At least one nonresident permit in 2021			
	(n) No nonresident permit in 2021			
	<u>NOTE: Permit numbers will be determined in May 2021</u>			

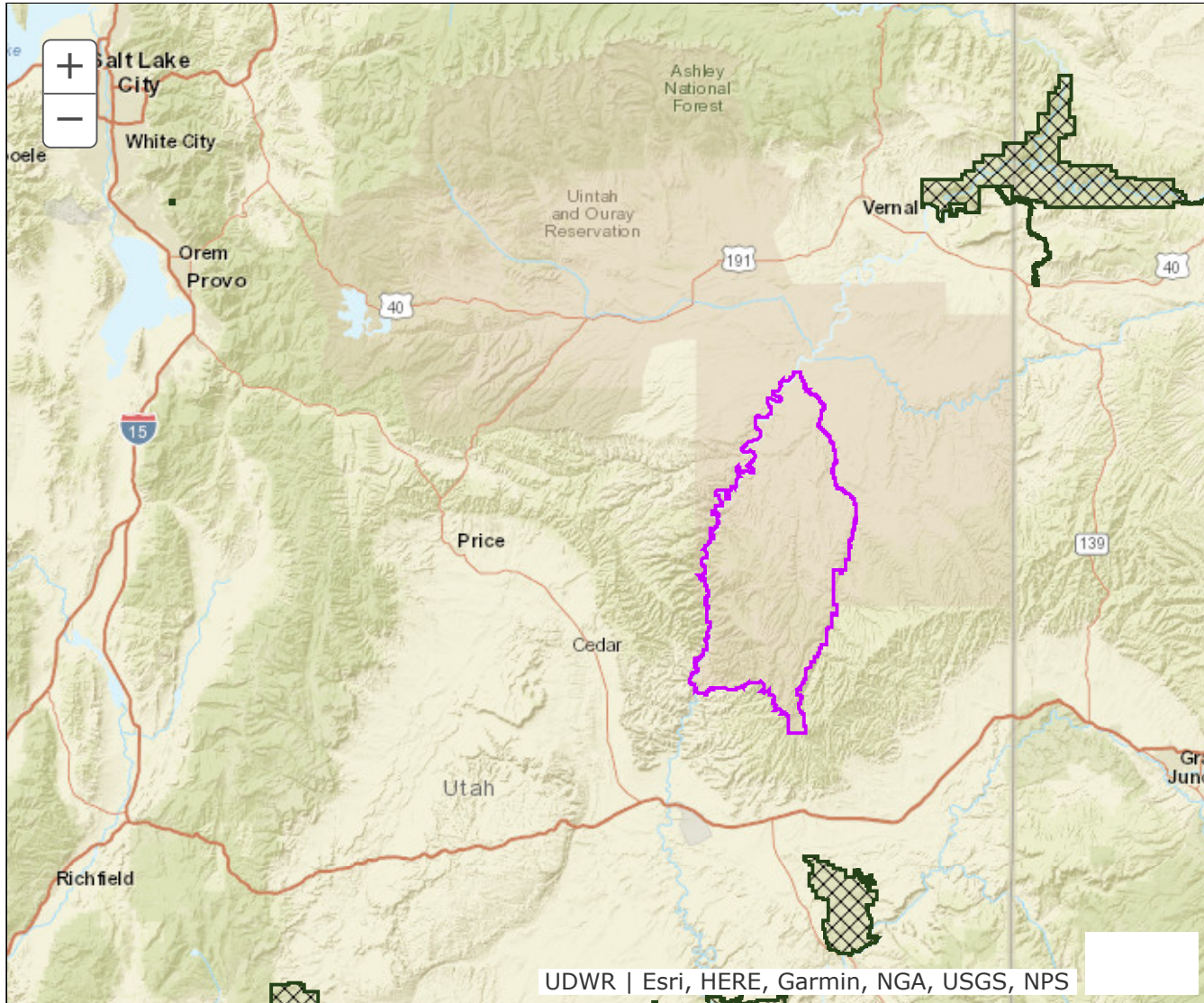




BOUNDARY RECOMMENDATION

UNIT Book Cliffs, Wild Horse Bench

SPECIES Bison

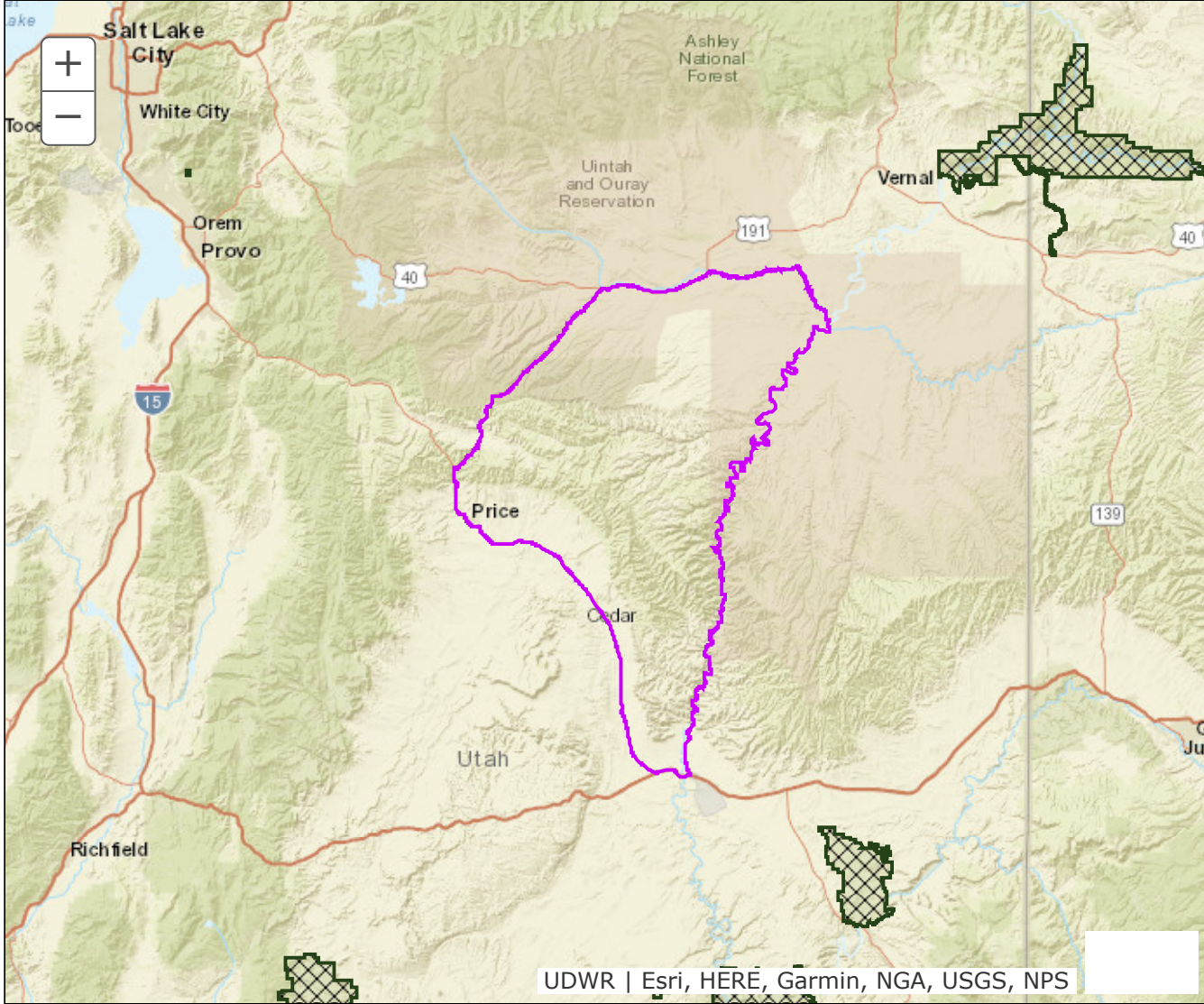


Updated Boundary: Grand and Uintah counties--Boundary begins at the confluence of Willow Creek and the Green River; south along the Green River to Coal Creek and the Ute Indian Reservation boundary; east and north on this boundary to Willow Creek (between Lower Bottom Canyon and Bull Canyon); north along this creek to the Green River. EXCLUDES ALL NATIVE AMERICAN TRUST LAND. USGS 1:100,000 Maps: Huntington, Price, Seep Ridge, Vernal, Westwater. Boundary Questions? Call the Vernal office, 435-781-9453.

BOUNDARY RECOMMENDATION

UNIT Nine Mile

SPECIES Bison

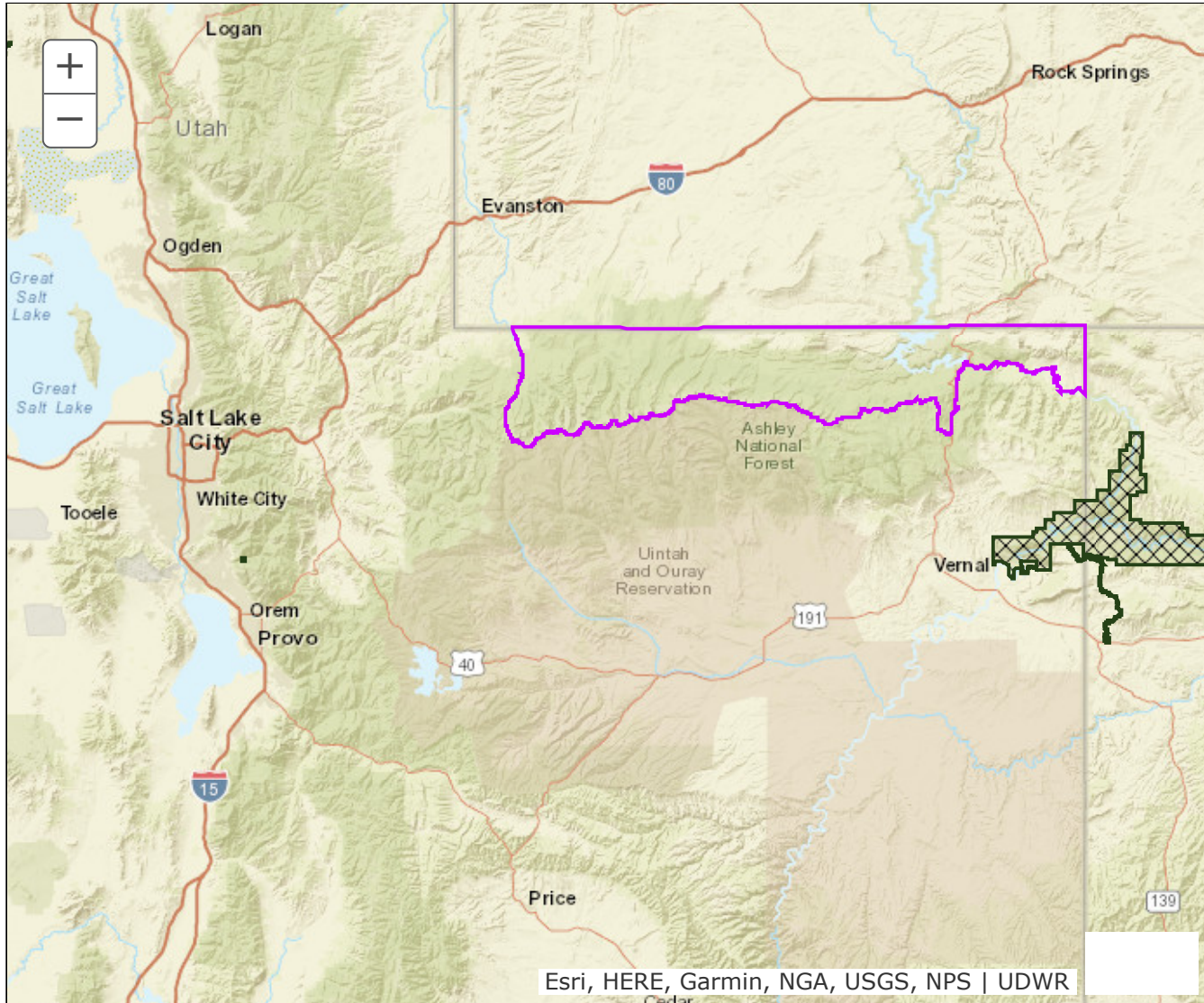


Updated Boundary: Carbon, Duchesne, Emery and Uintah counties--Boundary begins at US-40 and US-191 in Duchesne; southwest on US-191 to US-6; southeast on US-6 to I-70; east on I-70 to Exit 164 and SR-19 near the town of Green River; north and west on SR-19 to Hastings Road; north on this road to the Swasey boat ramp and the Green River; north along this river to the Duchesne River; west along this river to US-40 at Myton; west on US-40 to US-191 in Duchesne. EXCLUDES ALL NATIVE AMERICAN TRUST LANDS WITHIN THIS BOUNDARY. Excludes all CWMUs. USGS 1:100,000 Maps: Duchesne, Huntington, Price, Seep Ridge, Vernal.; Boundary questions? Call the Vernal office, 435-781-9453 or the Price office, 435-613-3700.

BOUNDARY RECOMMENDATION

UNIT North Slope

SPECIES Deer

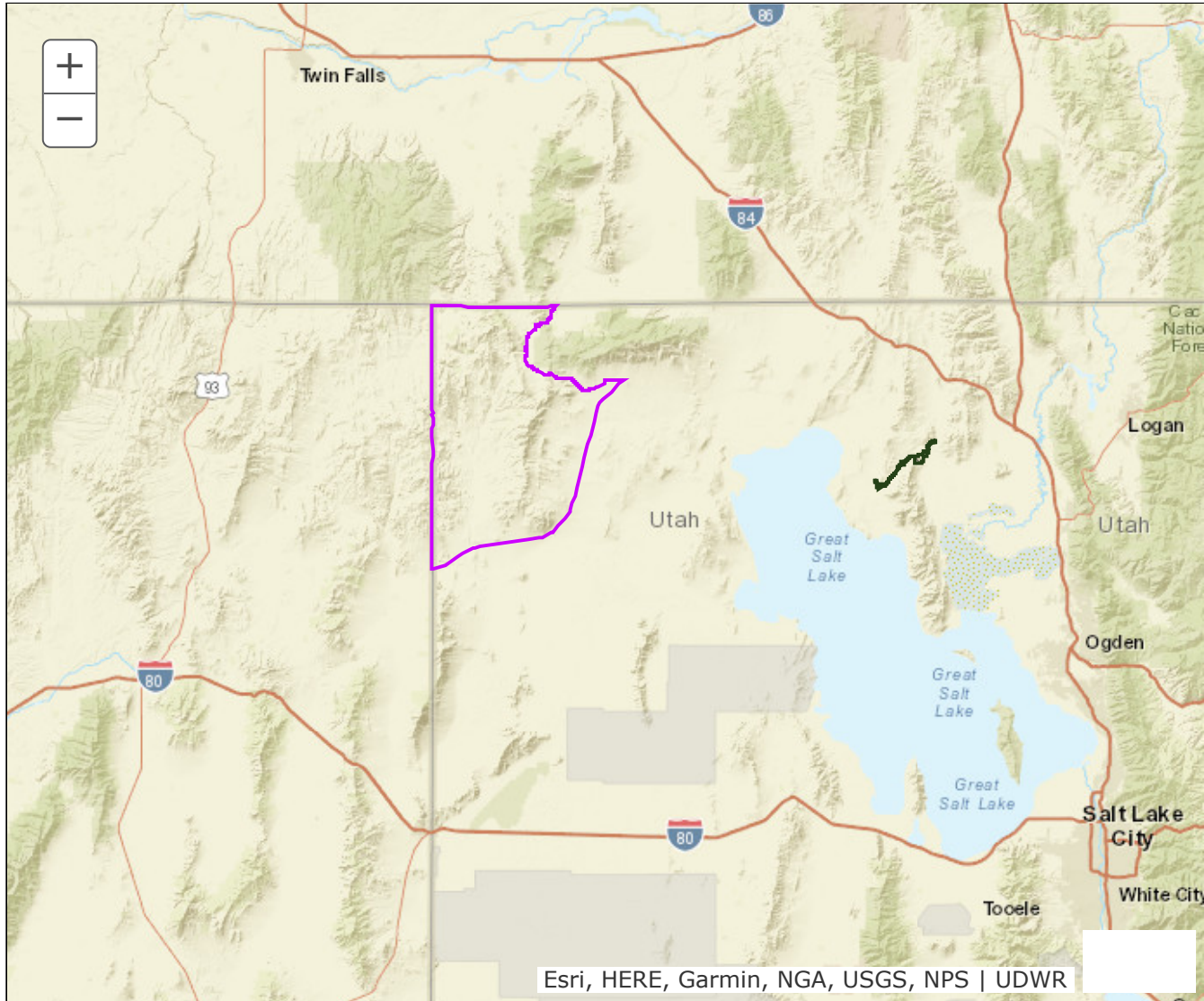


Updated Boundary: Daggett and Summit counties--Boundary begins SR-150 and the Summit-Duchesne county line at Hayden Pass (summit of the Uinta Mountains); north on SR-150 to the Utah-Wyoming state line; east on this state line to the Utah-Colorado state line; south on this state line to the Green River; west along this river to Flaming Gorge Reservoir; west along the south shoreline of this reservoir to Cart Creek; south along this creek to US-191; south on US-191 to the Uintah-Daggett County line (summit of the Uinta Mountains); west along the summit of the Uinta mountains to SR-150 at Hayden Pass. USGS 1:100,000 Maps: Dutch John, Kings Peak. Boundary questions? Call the Vernal office, 435-781-9453.

BOUNDARY RECOMMENDATION

UNIT Box Elder, Grouse Creek

SPECIES Elk

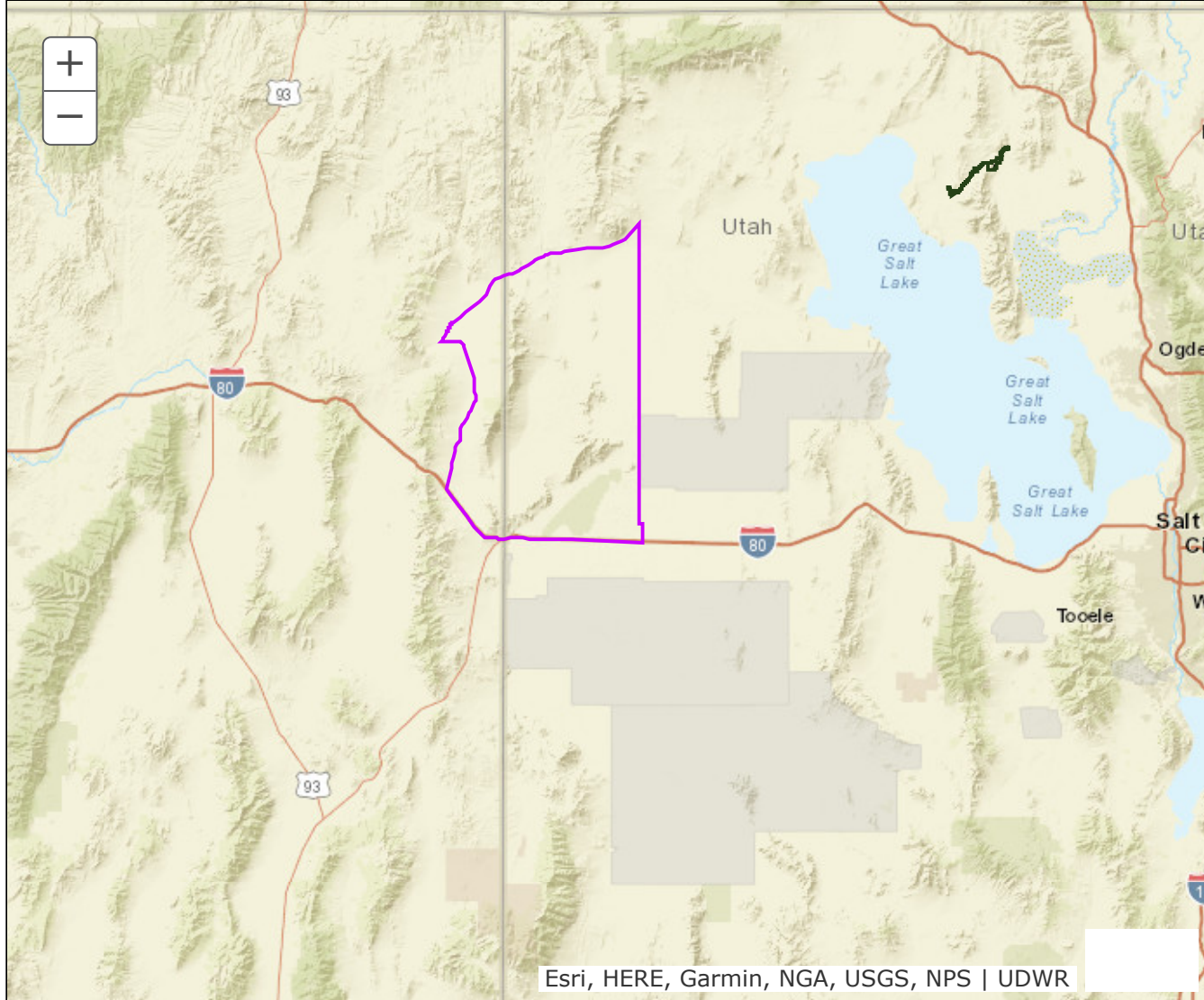


Updated Boundary: Box Elder County--Boundary begins on the Utah-Idaho state line at the Lynn/Almo, Idaho road and the Utah-Idaho state line; southwest on this road through the Raft River Narrows to Lynn and the Lynn Valley road; south on this road to the Dove Creek road; southeast on this road over Dove Creek Pass to SR-30 near Rosette; south and west on SR-30 to the Utah-Nevada state line; north on this state line to the Utah-Idaho state line; east on this state line to the Lynn/Almo, Idaho road. This hunt is comprised of all or largely private property. Hunters should acquire written permission from the landowner before applying for this hunt. Excludes all CWMUs. USGS 1:100,000 Maps: Grouse Creek, Jackpot, Newfoundland Mountains, Wells. Boundary Questions? Call Ogden office, 801-476-2740.

BOUNDARY RECOMMENDATION

UNIT Box Elder, Pilot Mtn

SPECIES Elk

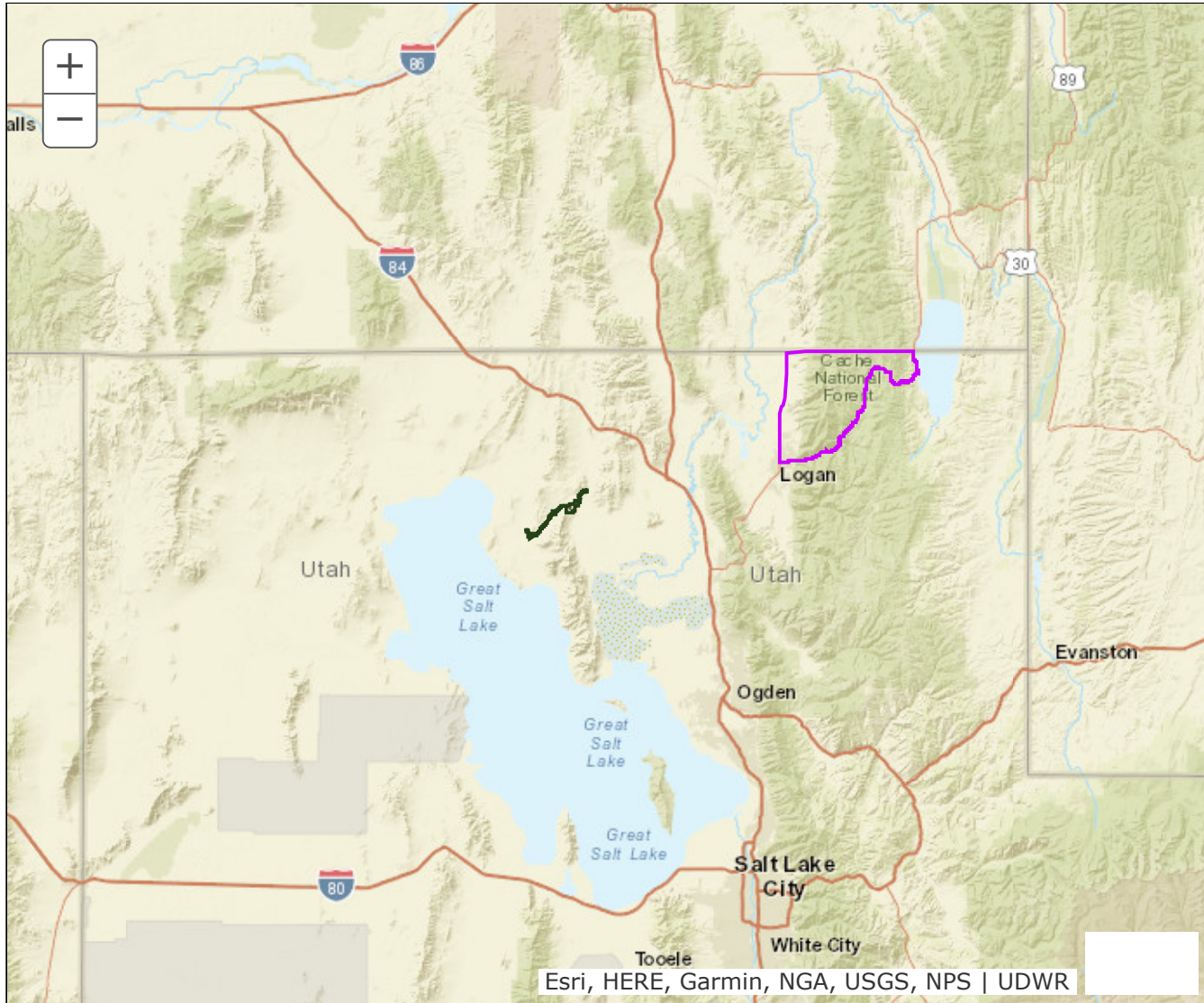


Updated Boundary: Box Elder and Tooele counties—Boundary begins at SR-30 and the Utah-Nevada state line; east on SR-30 to the township line between R15W and R16W; south on this line to I-80; west on I-80 to Pilot Creek Valley road; north along this road to SR-30; east on SR-30 to the Utah-Nevada state line. Elk hunters with this permit may hunt Nevada’s portion of this interstate unit (091) and abide by Nevada laws. USGS 1:100,000 Maps: Newfoundland Mtns., Bonneville Salt Flats, Wells, Wendover. Boundary questions? Call the Ogden office, 801-476-2740. Nevada hunt regulation questions? Call NDOW, (775) 777-2300.

BOUNDARY RECOMMENDATION

UNIT Cache, North

SPECIES Elk

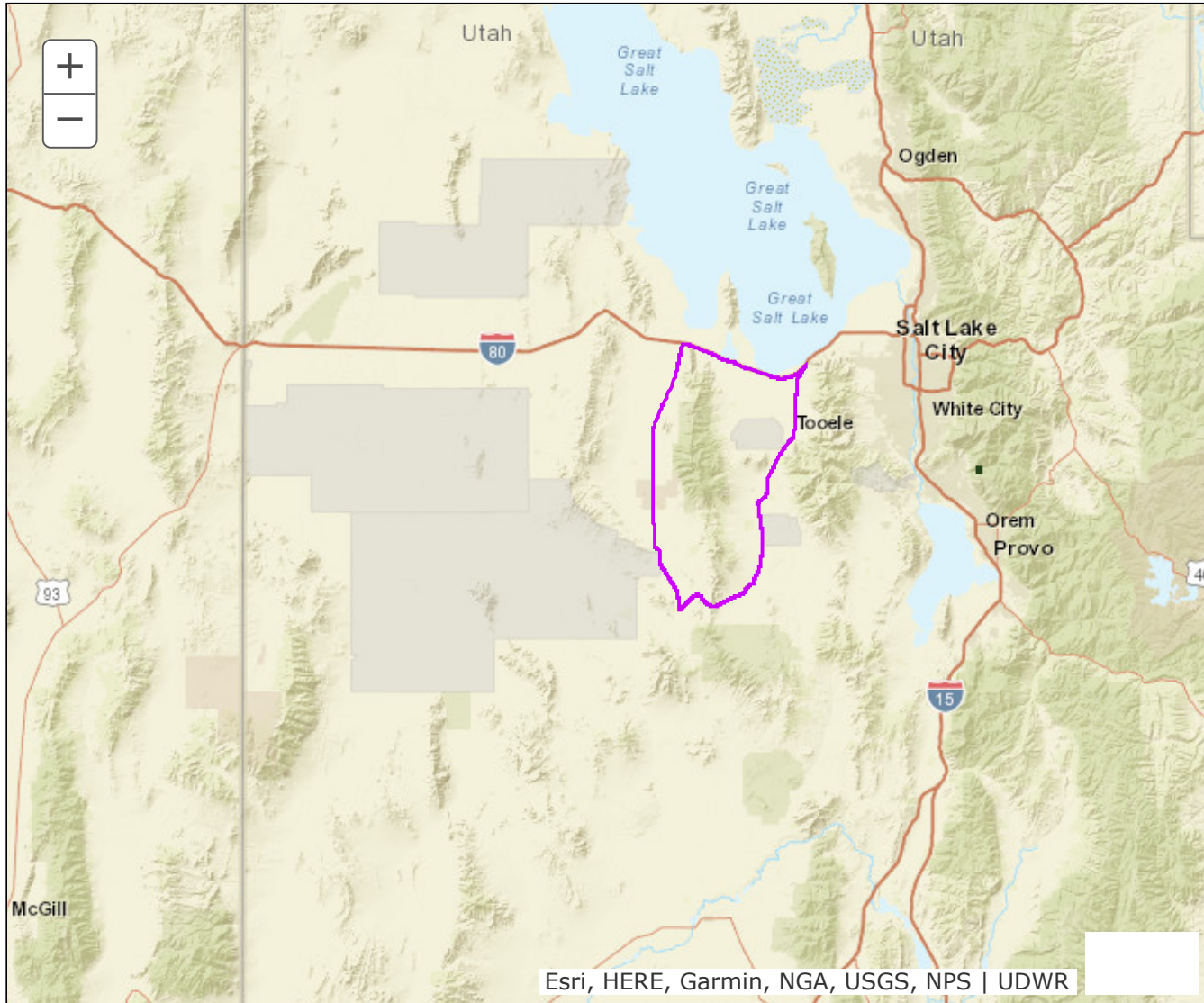


Updated Boundary: Cache, Box Elder and Rich counties--Boundary begins at US-91 and the Utah-Idaho state line; south on US-91 to US-89 in Logan; east and north on US-89 to the Utah-Idaho state line; west along this state line to US-91. USGS 1:100,000 Maps: Tremonton, Logan. Boundary questions? Call the Ogden office, 801-476-2740.

BOUNDARY RECOMMENDATION

UNIT Oquirrh-Stansbury, West

SPECIES Elk

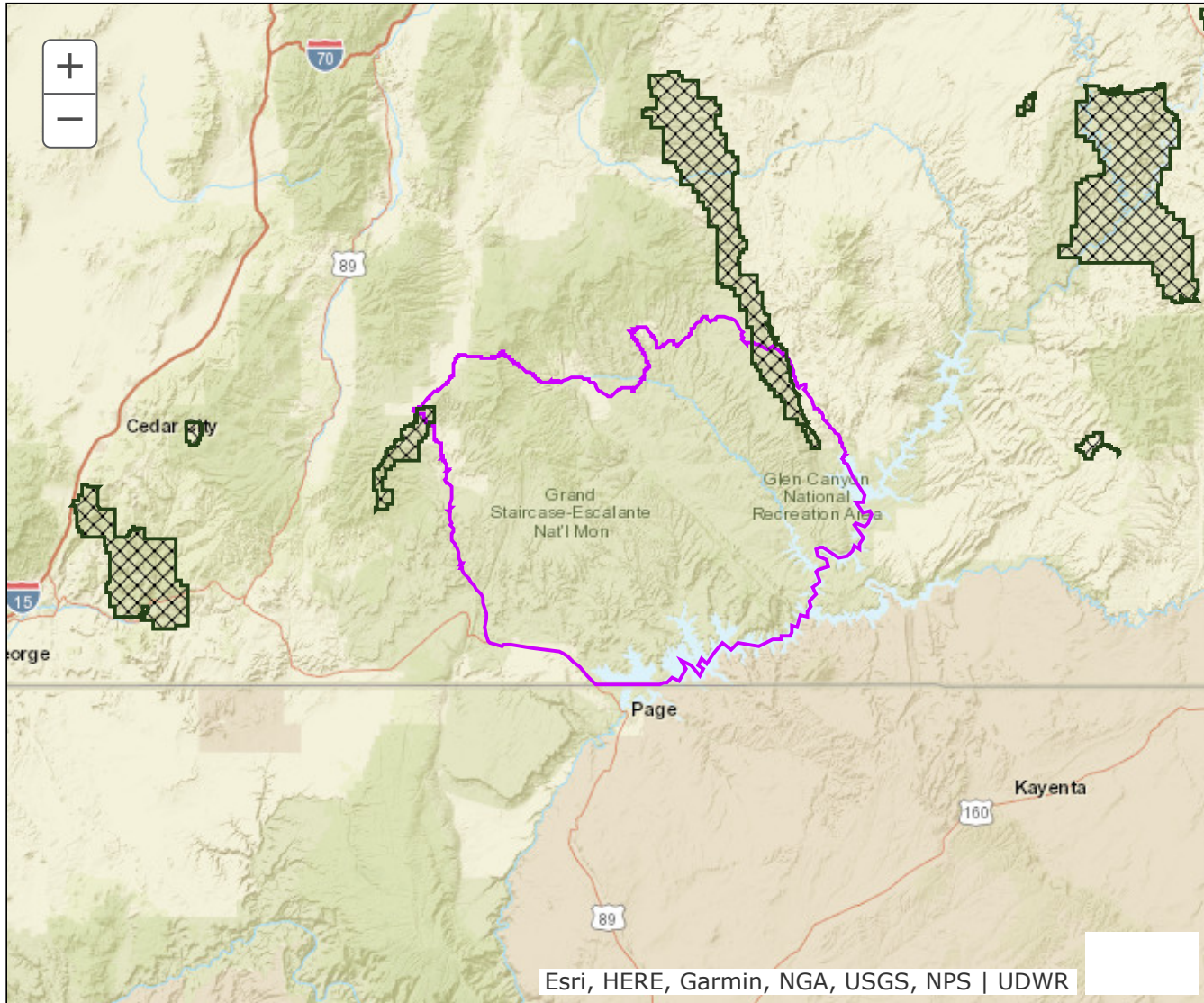


Updated Boundary: Salt Lake, Tooele and Utah counties--Boundary begins at I-80 and SR-36; south on SR-36 to Pony Express Road; west on this road to the Skull Valley road; north on this road to I-80 at Rowley Junction; east on I-80 to SR-36. EXCLUDES ALL NATIVE AMERICAN TRUST LANDS WITHIN THIS BOUNDARY. Excludes all CWMUs. USGS 1:100,000 Maps: Provo, Rush Valley, Salt Lake City, Tooele. Boundary questions? Call the Springville office, (801) 491-5678.

BOUNDARY RECOMMENDATION

UNIT Plateau, Barney Top/Kaiparowits

SPECIES Elk

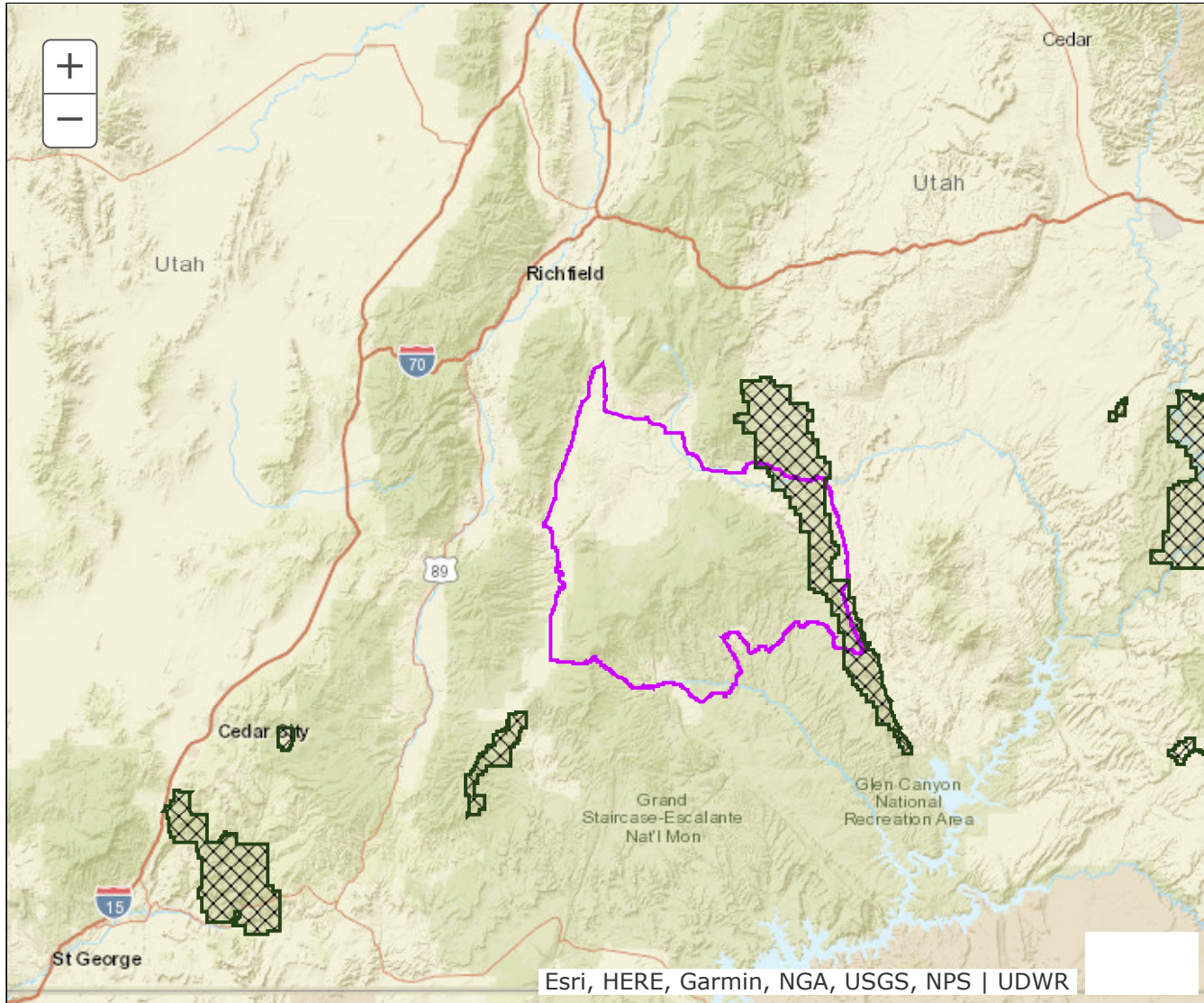


Updated Boundary: Garfield and Kane counties--Boundary begins SR-12 and the Paria River in Cannonville; south on the Paria river to US-89; east on US-89 to the Utah/Arizona border; east on the Utah/Arizona border to Lake Powell; east and north on Lake Powell to Bullfrog creek and the Notom Road; north on the Notom Road to the Burr Trail; west on the Burr Trail to Boulder and SR-12; west on SR-12 to Main Canyon-Sweetwater Road; west on Main Canyon-Sweetwater Road to John's Valley Road; south on John's Valley Road to SR-12; east on SR-12 to Cannonville and the Paria River. USGS 1:100,000 Maps: Escalante, Navajo Mountain, Smoky Mountain. Boundary questions? Call the Cedar City office, 435-865-6100

BOUNDARY RECOMMENDATION

UNIT Plateau, Boulder Elk

SPECIES Elk

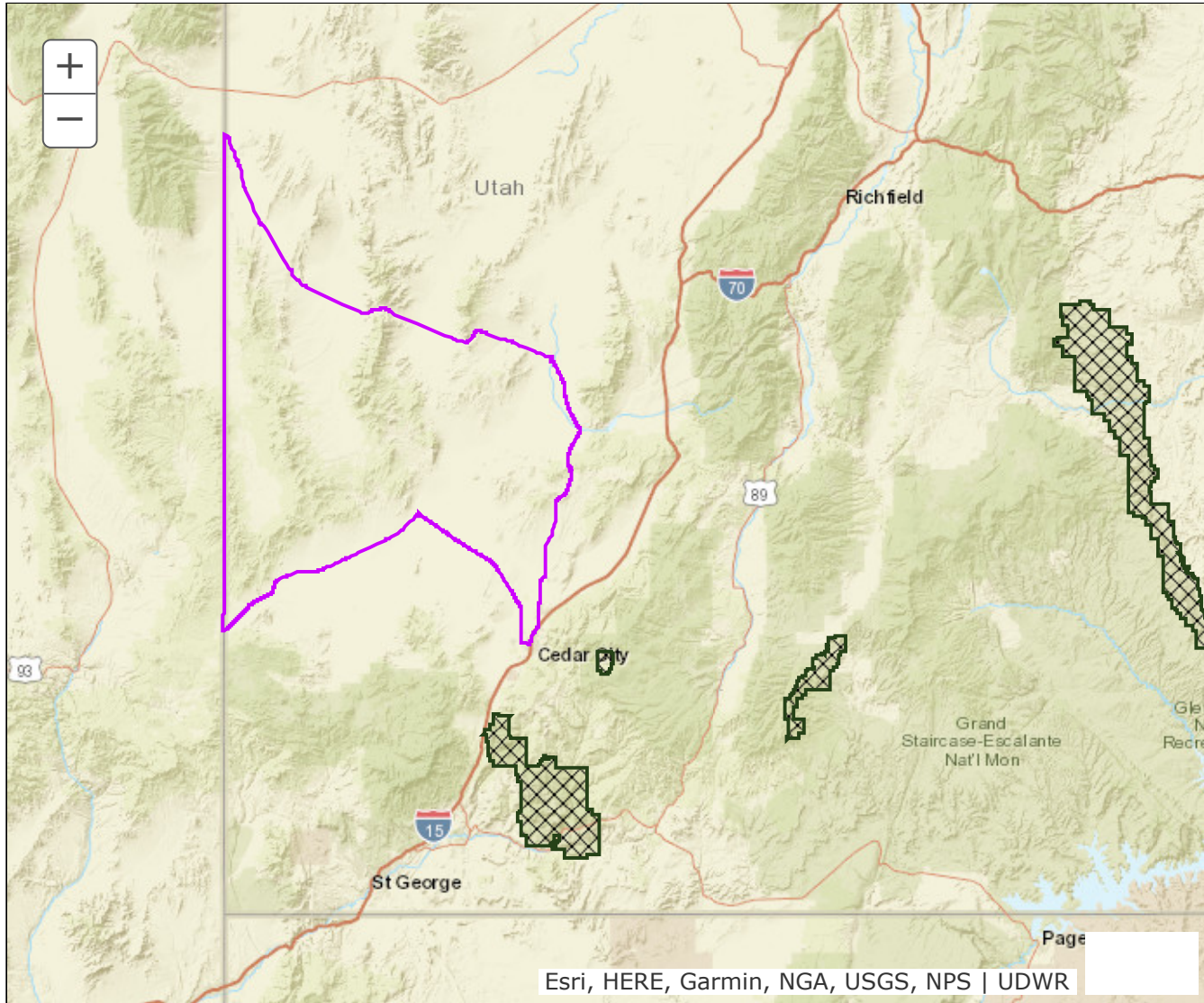


Updated Boundary: Garfield, Piute, Sevier and Wayne counties--Boundary begins at SR-24 and SR-62; south on SR-62 to SR-22; south on SR-22 to the Main Canyon-Sweetwater road; east on Main Canyon-Sweetwater road to SR-12; east on SR-12 to Boulder and the Burr Trail road; east on this road to the Notom road; north on this road to SR-24; west on SR-24 to SR-62. Excludes all CWMUs. USGS 1:100,000 Maps: Escalante, Loa, Panguitch, Salina. Boundary questions? Call Cedar City office, 435-865-6100.

BOUNDARY RECOMMENDATION

UNIT Southwest Desert, South

SPECIES Elk

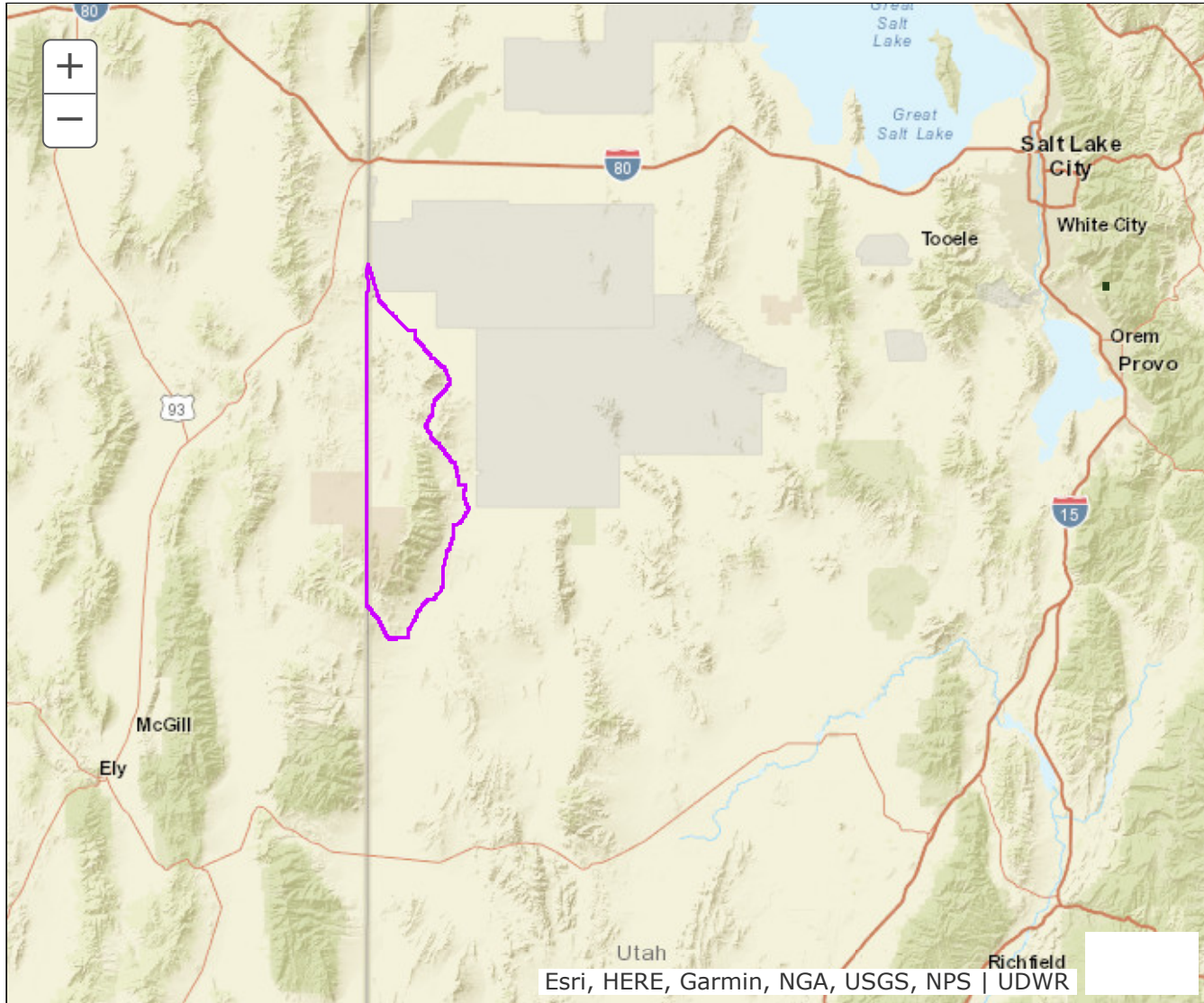


Updated Boundary: Beaver, Iron and Millard counties—Boundary begins at the Utah-Nevada state line and US-6/50; east on SR-21; south on SR-21 to SR-130; south on SR-130 to I-15; south on I-15 to SR-56; west on SR-56 to the Lund highway; northwest on this highway to Lund and the Union Pacific railroad tracks; southwest along these tracks to the Utah-Nevada state line; north on this state line to US-6/50. Excludes all CWMUs. USGS 1:100,000 Maps: Beaver, Caliente, Cedar City, Delta, Garrison, Richfield, Wah Wah Mountains

BOUNDARY RECOMMENDATION

UNIT West Desert, Deep Creek

SPECIES Elk

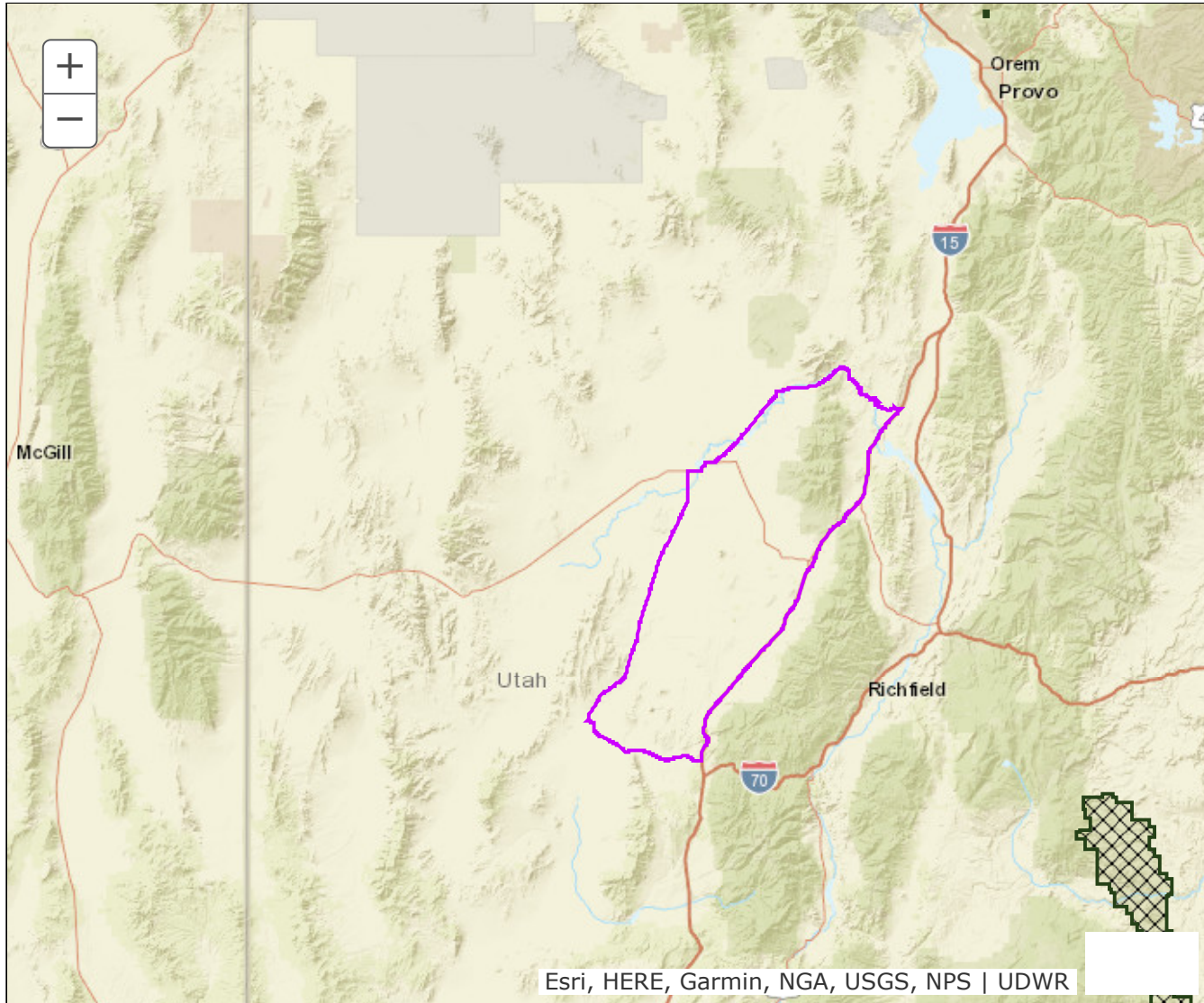


Updated Boundary: Juab and Tooele counties--Boundary begins at the Pleasant Valley road and the Utah-Nevada state line; north along this state line to the Salt Springs (Blue Lake) road; south on this road to the Pleasant Valley road; northwest on this road to the Utah-Nevada state line. EXCLUDES ALL NATIVE AMERICAN TRUST LAND WITHIN THIS BOUNDARY. Access is limited. USGS 1:100,000 Maps: Fish Springs, Wildcat Mountain. Boundary questions? Call the Springville office, 801-491-5678.

BOUNDARY RECOMMENDATION

UNIT Fillmore, Oak Creek South

SPECIES Pronghorn

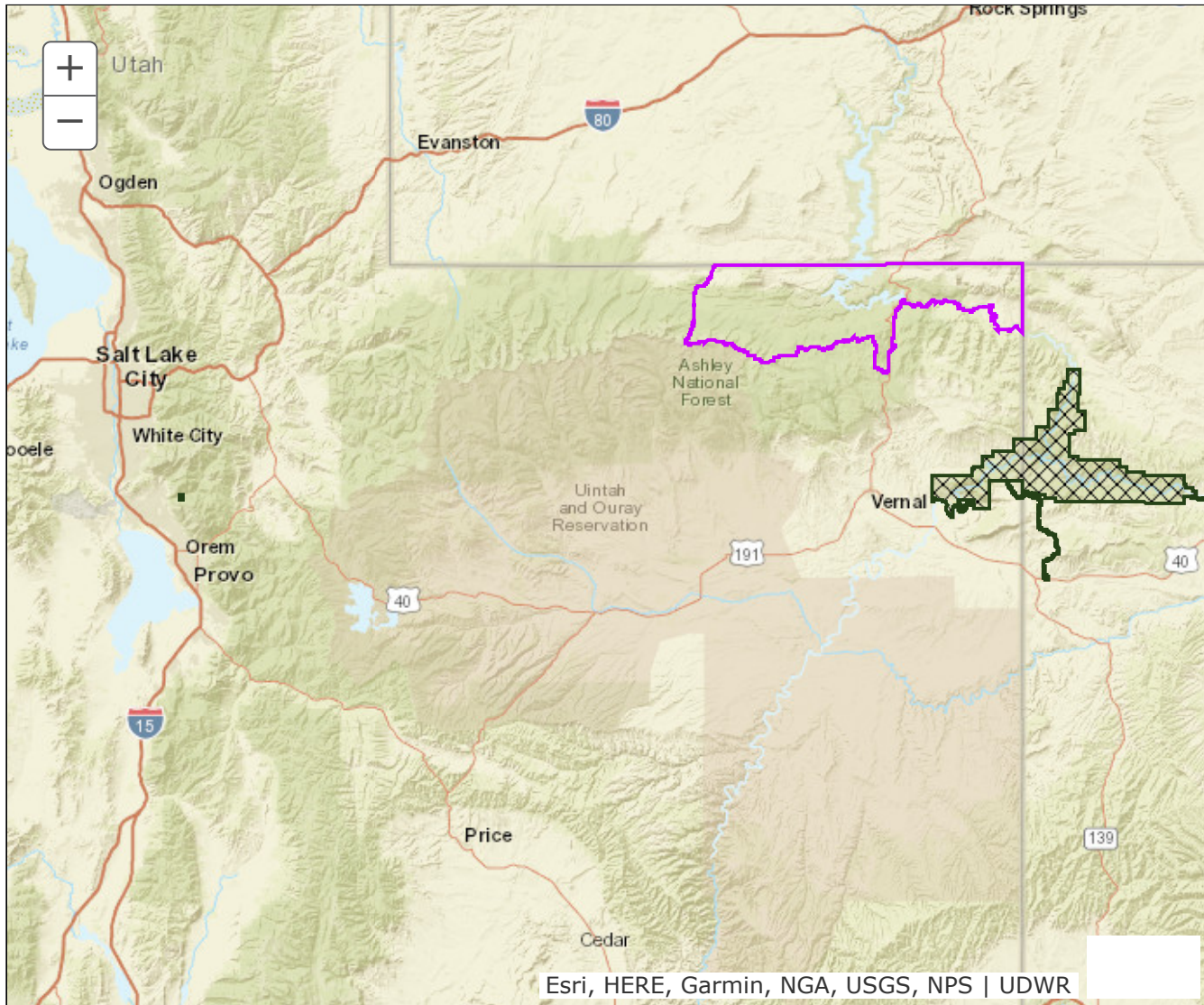


Updated Boundary: Juab and Millard counties--Boundary begins at I-15 (Exit-207) and the Mills road; west on this road to the railroad tracks; west on these tracks to the Sevier River; north along this river to SR-132; west on SR-132 to US-50; west on US-50 to SR-257; south on SR-257 to the Black Rock road; east on this road to I-15; north on I-15 to Exit 207 and the Mills road. USGS 1:100,000 Maps: Delta, Lynndyl, Manti, Nephi, Richfield. Boundary questions? Call the Cedar City office, 435-865-6100.

BOUNDARY RECOMMENDATION

UNIT North Slope, Three Corners/West Daggett

SPECIES Pronghorn

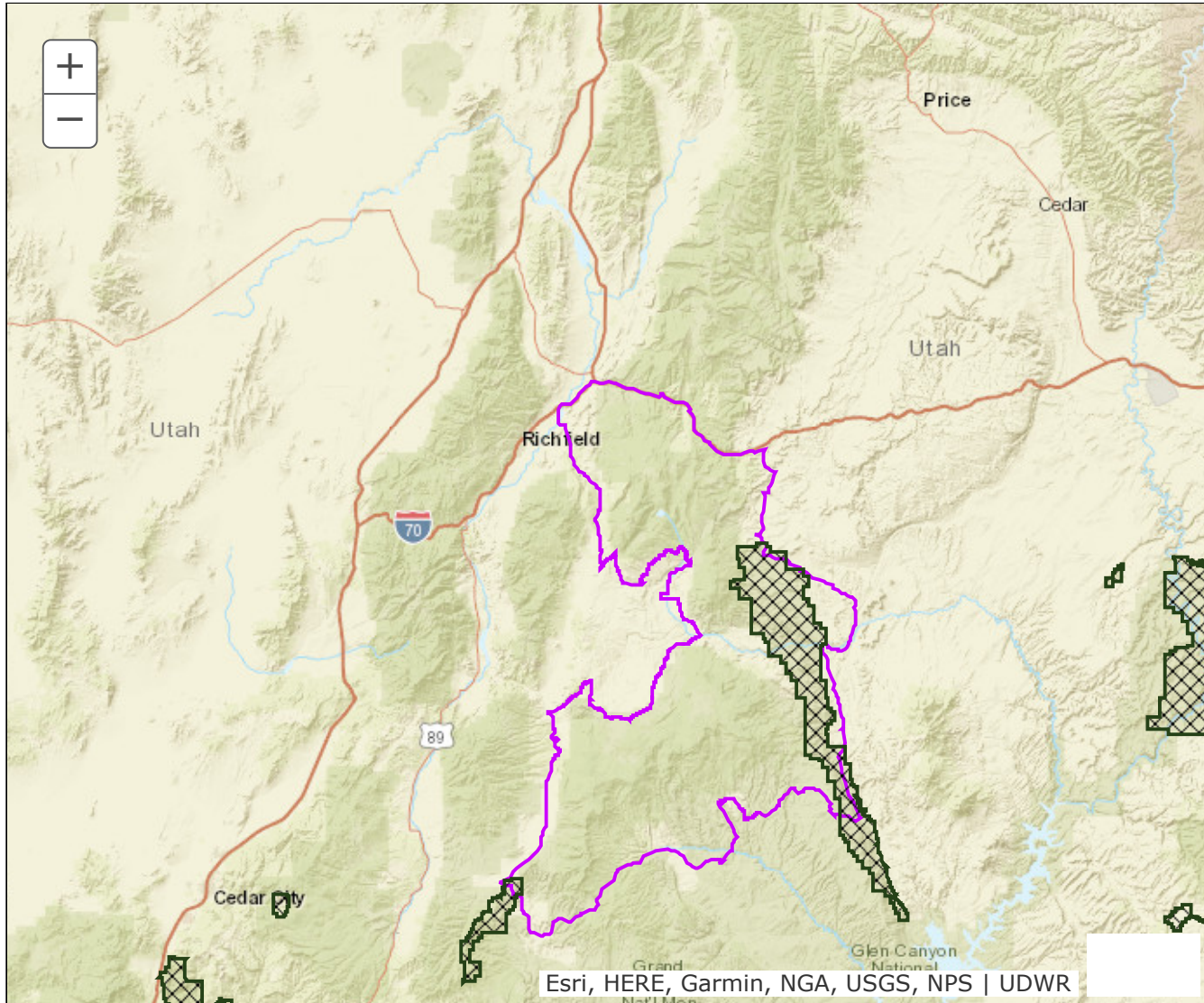


Updated Boundary: Daggett and Summit counties—Boundary begins at the Utah-Wyoming-Colorado state line (Three Corners); south on the Utah-Colorado state line to the Green River; west along the Green River to Flaming Gorge Reservoir; west along the south shoreline of Flaming Gorge Reservoir to Cart Creek; south along this creek to US-191; south on US-191 to the Uintah/Daggett county line (summit of the Uinta Mountains); west along this summit to the head of Burnt Fork drainage (Divide Pass/Island Lake); north along the Burnt Fork drainage bottom and Burnt Fork Creek to the Utah-Wyoming state line; east on this state line to the Utah-Wyoming-Colorado state line (Three Corners). USGS 1:100,000 Maps: Dutch John, Kings Peak. Boundary questions? Call the Vernal office, 435-781-9453.

BOUNDARY RECOMMENDATION

UNIT Plateau, Highlands

SPECIES Pronghorn



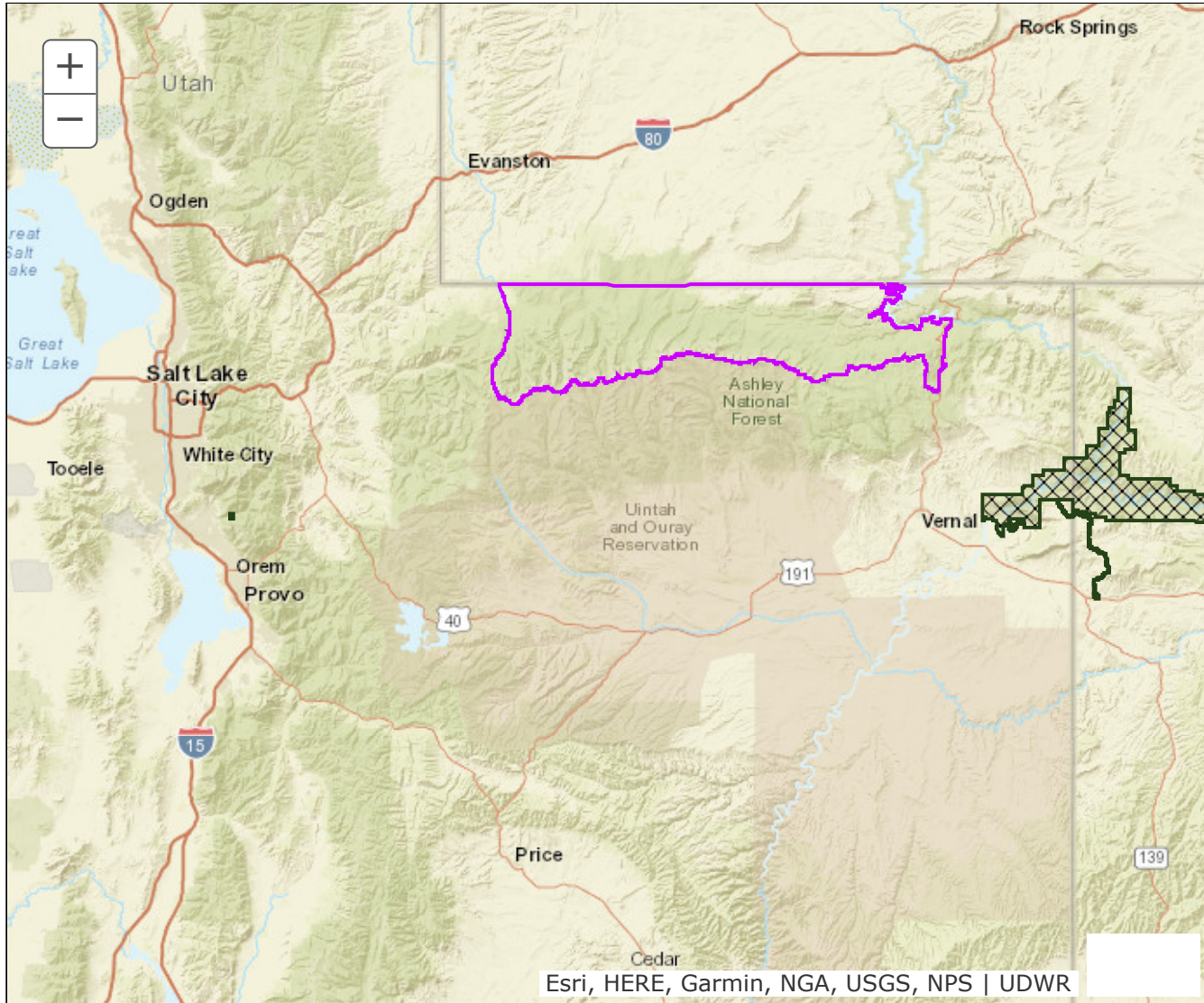
Updated Boundary: Garfield, Piute, Sevier and Wayne counties—Boundary begins at I-70 and US-89 north of Sigurd; south on US-89 to SR-24; south on SR-24 to SR-25; east on SR-25 to Fishlake Road; south on this road to SR-24; east on SR-24 to North Mountain Road; north on this road to Vance Road; east on this road to CR-4087; north-east on CR-4087 to the Fremont River Road; south on this road to SR-72; south on SR-72 to SR-24; south on SR-24 to Hatchery Road; west on this road to Smooth Knoll Road; south on this road to NF-157 (USFS road), west on NF-157 to NF-571, west on NF-571 to NF-139; north on NF-139 to NF-85; north-west on NF-85 to Wildcat Road; north on this road to Parker-Antimony Road; west on this road to the Widtsoe-Antimony road; south on this road to SR-12; east on SR-12 to the Burr Trail at Boulder; east on the Burr Trail to the Notom road; north on the Notom road to SR-24; east on SR-24 to the Caineville Wash road; north along this road to the Cathedral Valley road; west on this road to Rock Springs Bench and the Last Chance Desert road; north on this road to the Blue Flats road; north and east on this road to the Willow Springs road; north on this road towards Windy Peak and the Windy Peak road; west on this road to SR-72;

north on SR-72 to I-70; west on I-70 to US-89 north of Sigurd. EXCLUDES ALL NATIONAL PARKS.

BOUNDARY RECOMMENDATION

UNIT North Slope, Summit/West Daggett

SPECIES RMBHS

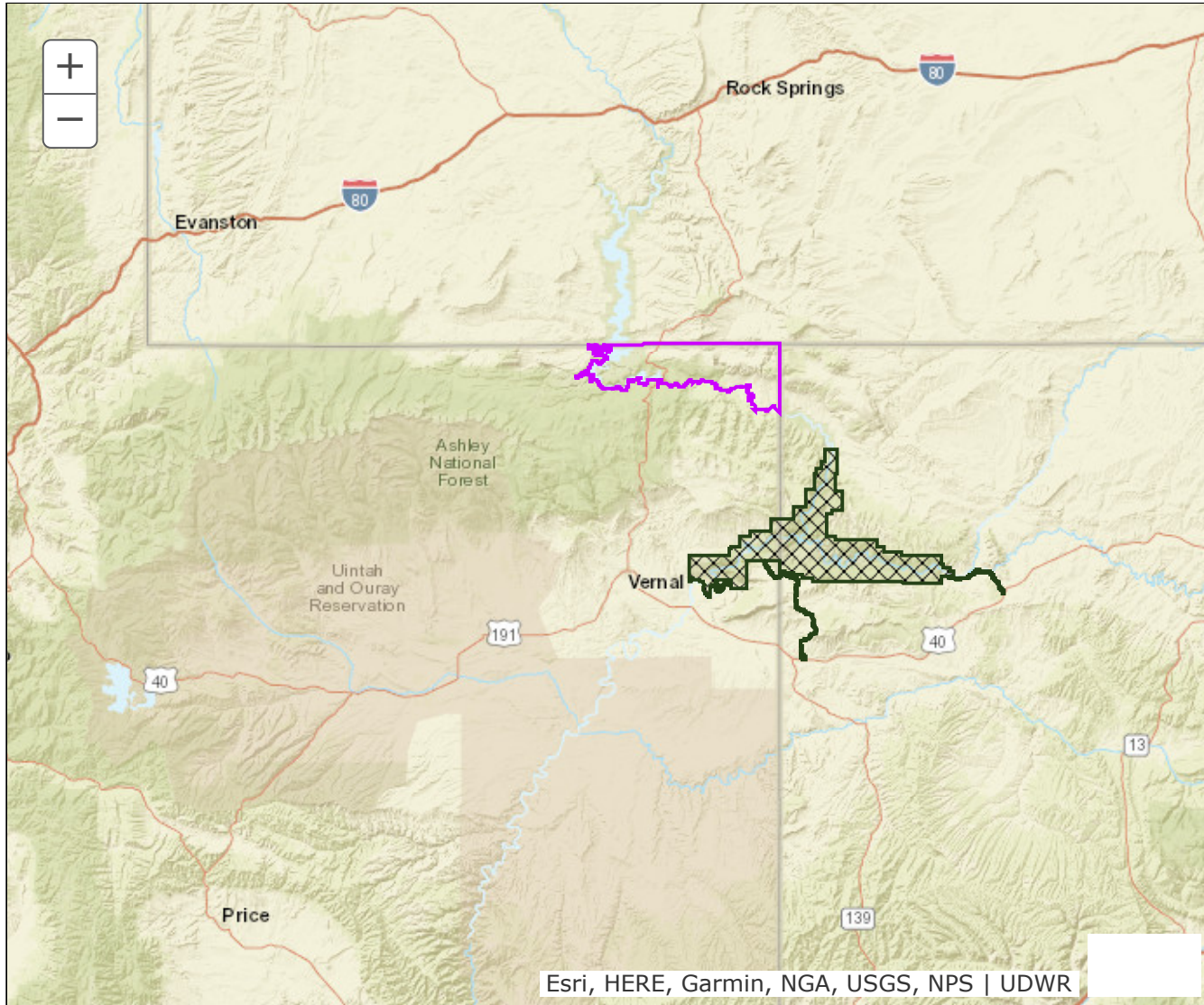


Updated Boundary: Daggett and Summit counties—Boundary begins at SR-150 and the Summit-Duchesne county line at Hayden Pass; north along SR-150 to the Utah-Wyoming state line; east along this state line to Flaming Gorge Reservoir main channel western shoreline (on the east side of Lucerne Point); west around Lucerne Point to the Utah-Wyoming state line (includes Lucerne Point); west along the state line to the western shore of Flaming Gorge Reservoir; south and east along this shoreline to Cart Creek; south along Cart Creek to US-191; south along US-191 to the Uintah-Daggett county line (summit of the Uinta Mountains); west along the summit of the Uinta Mountains to Hayden Pass and SR-150. USGS 1:100,000 Maps: Dutch John, Kings Peak. Boundary questions? Call the Vernal office, (435) 781-9453 or Ogden office, (801) 476-2740.

BOUNDARY RECOMMENDATION

UNIT North Slope, Three Corners

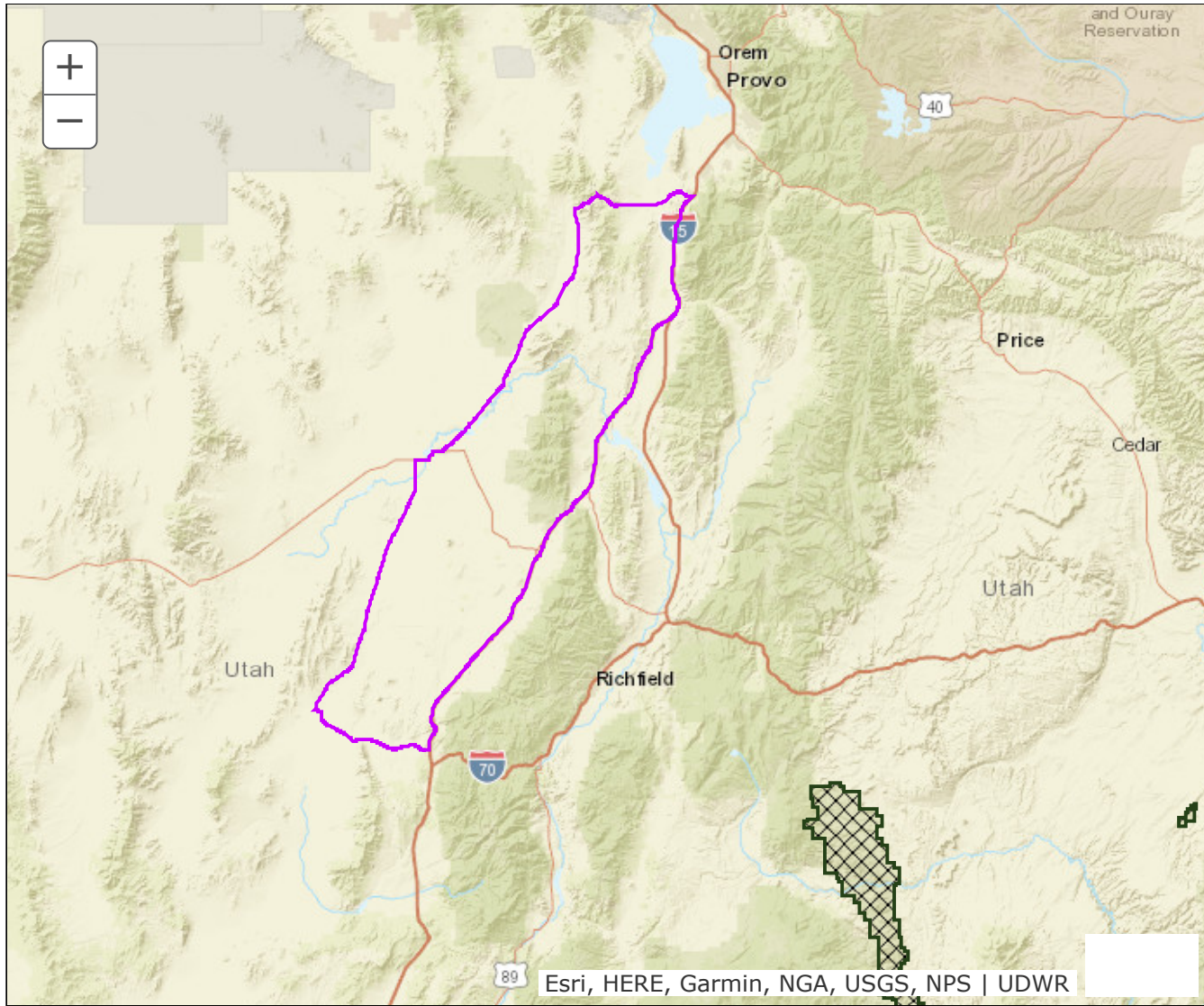
SPECIES RMBHS



Updated Boundary: Daggett County--Boundary begins at the Flaming Gorge Reservoir main channel western shoreline on the east side of Lucerne Point at the Utah-Wyoming state line; east on this state line to the Utah-Colorado state line; south on this state line to the Green River; west along this river to the Flaming Gorge Reservoir west shoreline; west along this shoreline to the Utah-Wyoming state line; east along the state line to Lucerne Point; east around Lucerne Point to the Utah-Wyoming State line. Excludes all CWMUs. USGS 1:100,000 Maps: Dutch John. Boundary questions? Call Vernal office, 435-781-9453.

BOUNDARY RECOMMENDATION

UNIT Fillmore, Oak Creek (cougar)



Updated Boundary: Juab, Millard, Sanpete and Sevier counties—Boundary begins at Black Rock Road and I-15(Exit 135); west on Black Rock Road to SR-257; north on SR-257 to US-6/50; east on US-6/50 to US-6; northeast on US-6 to Santaquin and I-15; south on I-15 to Exit 135 and Black Rock Road. Boundary questions? Call the Cedar City office, 435-865-6100.

R657. Natural Resources, Wildlife Resources.

R657-38. Dedicated Hunter Program.

R657-38-1. Purpose and Authority.

(1) Under the authority of Section 23-14-18, this rule provides the standards and requirements for qualified deer hunters to participate in the Dedicated Hunter Program by obtaining a certificate of registration.

(2) The Dedicated Hunter Program is a program that:

- (a) provides expanded hunting opportunities;
- (b) requires participation in wildlife conservation projects; and
- (c) provides educational training in hunter ethics and wildlife management principles.

R657-38-3. Dedicated Hunter Certificates of Registration.

(1)(a) To participate in the program, a person must apply for, be issued, and sign a Dedicated Hunter certificate of registration as prescribed by the Division.

(b) Certificates of registration are issued by the Division through a drawing as prescribed in the guidebook of the Wildlife Board for taking big game and R657-62.

(c) Certificates of registration are valid for three consecutive years, except as provided by R657-38-10 and R657-38-13, beginning on the date the big game drawing results are released and ending on the last day of the general season hunt for the third year of enrollment.

(d) The quantity of Dedicated Hunter certificates of registrations [available in the big game drawing](#) is limited to:

[\(i\) 15 percent of the total annual general season buck deer quota for each respective hunt area, inclusive of those certificates of registration that are within their effective term; or](#)

[\(ii\) one resident and one non resident certificate of registration if the 15 percent total on that hunt area is met or exceeded.](#)

(e) Certificates of registration remaining unissued from the Dedicated Hunter portion of the big game drawing shall be redistributed as general single-season permits for their respective hunt areas in the general buck deer drawing.

(2) The Division may deny issuance of a Dedicated Hunter certificate of registration for any of the reasons identified as a basis for suspension in Section 23-19-9(7) and R657-38-15.

(3)(a) A certificate of registration conditionally authorizes the participant to obtain a Dedicated Hunter permit which may be used to hunt deer within the area listed on the permit, during the general archery, general muzzleloader and general any legal weapon buck deer seasons according to the dates and boundaries established by the Wildlife Board.

(b) When available, the certificate of registration may also authorize the permit to include the general deer archery extended area during the extended season dates.

(c) The person must use the appropriate weapon type specified by each season and boundary.

(4) The participant's hunt area, as issued through the drawing, shall remain the same for the entire duration of that program enrollment period.

(5) Participants in the program shall be subject to any changes subsequently made to this or other rules during the term of enrollment.

KEY: wildlife, hunting, recreation, wildlife conservation

Date of Enactment or Last Substantive Amendment: February 7, 2019

Notice of Continuation: October 5, 2015

Authorizing, and Implemented or Interpreted Law: 23-14-18



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

BRIAN C. STEED
Executive Director

Division of Wildlife Resources

MICHAL D. FOWLKS
Division Director

MEMORANDUM

Date: Nov. 2, 2020

To: Utah Wildlife Board / Regional Advisory Council Members

From: Covy Jones, Big Game Coordinator

Subject: **2021 regional deer unit plan revisions**

Traditionally, the Utah Division of Wildlife Resources (DWR) revises its mule deer unit plans from the five DWR administrative regions on a rotating schedule. This occurs in conjunction with the reports of the Utah Range Trend Monitoring Project. For 2021, the deer unit plans for the Southern Region and Southeastern Region have undergone full revisions based on results from the Utah Range Trend Monitoring Project. In addition, we have also revised deer unit plans in the other three DWR administrative regions based on provisions in HB125, which directs predator management in relation to unit deer population objectives and current population estimates.

The ongoing statewide deer-survival study has provided new insights into the relationship between deer, habitat and predators. As part of that study, we have been able to document cause-specific deer mortality factors and measure body condition scores annually on live deer across multiple units spread across the state. This information has helped us refine deer population models and get a better understanding of limiting factors and unit population carrying capacity. Taking that information into consideration, DWR regions have consulted with diverse constituencies on each deer unit and are recommending changes to the population objectives for several deer units (see table 1).

The DWR must obtain Wildlife Board approval for any deer unit plan with changes to unit boundaries, buck-to-doe ratio objectives or population objectives. Other deer unit plans contain only minor updates, will be approved by the Division Director and are presented for your information. None of the DWR deer unit plans contain proposed boundary changes. Only one unit is proposing a change to the buck-to-doe ratio objective: The San Juan, Abajo Mountains are proposed to change from 15-17 bucks per 100 does to 18-20 bucks per 100 does, postseason. There are several units or sub-units with proposed adjustments to the population objective, as shown in Table 1. Six units have a proposed increase, 14 units have no changes proposed and 18 units have a proposed decrease.

Table 1. Proposed Utah Mule Deer Unit Population Objective Changes

Unit	Current Objective	New Objective
Box Elder	20,000	20,000
Cache	25,000	25,000
Ogden	11,000	11,000
Morgan-South Rich	18,000	16,000
East Canyon	13,500	13,500
Chalk Creek	10,500	12,000
Kamas	8,000	8,000
North Slope	10,000	10,000
South Slope, Yellowstone	13,000	11,000
South Slope, Diamond Mtn/Vernal	15,000	13,000
Book Cliffs	15,000	9,000
Nine Mile	8,500	8,500
San Rafael	1,000	No objective
La Sal, La Sal Mtns	13,000	8,000
La Sal, Dolores Triangle	5,100	3,100
San Juan, Abajo	13,500	13,500
San Juan, Elk Ridge	5,600	1,000
Henry Mtns	2,700	2,700
Central Mtns, Manti	38,000	28,000
Central Mtns, Nebo	22,600	14,000
Wasatch Mtns, West	22,600	22,600
Wasatch Mtns, Currant Creek	20,000	17,000
Wasatch Mtns, Avintaquin	5,000	4,000
Oquirrh-Stansbury	11,600	11,600
West Desert	11,200	11,200

Southwest Desert	4,000	3,500
Fillmore, Pahvant	12,000	7,600
Fillmore, Oak Creek	2,500	2,000
Beaver	13,000	14,000
Monroe	7,500	7,000
Mt Dutton	2,700	3,200
Plateau, Fishlake	10,000	7,000
Plateau, Thousand Lakes	3,000	1,400
Plateau, Boulder/Kaiparowits	12,000	8,500
Paunsaugunt	6,500	6,500
Panguitch Lake	10,000	11,000
Zion	15,500	19,000
Pine Valley	16,000	19,500
	454,100	403,800
* May investigate boundary change further within the life of the Plateau Thousand Lakes plan		

Key
Increased
Decreased
No Change

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 4
(Morgan-South Rich)
October 2017

BOUNDARY DESCRIPTION

Morgan, Rich, Summit and Weber counties – Boundary begins at the junction of I-80 and I-84 near Echo, Utah; east on I-80 to the Utah-Wyoming State line; north along this State line to SR-16; north on SR-16 to SR39 near Woodruff, Utah; west along SR-39 to SR-167 (Trappers Loop Road); south on SR-167 to SR-30 at Mountain Green, Utah; west on SR-167/SR-30 to I-84; east on I-84 to I-80.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP*

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	35,429	9%	3,217	2%
Bureau of Land Management	8,142	19%	4,695	1%	15,803	9%
Utah State Institutional Trust Lands	701	2%	5,876	2%	4,967	3%
Native American Trust Lands	0	0%	0	0%	0	0%
Private	34,386	79%	322,364	86%	133,812	80%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	37	<1%	6,084	2%	11,322	6%
TOTAL	43,266	100%	374,448	100%	169,121	100%

UNIT MANAGEMENT GOALS

Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing. Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies. Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Maintain a target population size of 16,000 wintering deer. This population objective remains both the short-term (5 year life of this plan) and long term, barring significant changes in range conditions.

Herd Composition – Maintain a minimum 3-year average postseason buck to doe ratio of 18-20:100 in accordance with the statewide plan.

Unit 4

1994-2003 Objective:	10,750
2003 Objective:	12,500
2003-2013 Objective:	12,000
2013-2018 Objective:	18,000
2018-2020 Objective:	18,000
<u>2020-2023 Objective:</u>	<u>16,000</u>

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size - Utilizing harvest data, postseason and spring classifications and mortality estimates, a computer model will be used to estimate winter population size. Annual mortality will be estimated based on survival of radio collared animals on a nearby representative unit.

Buck Age Structure - Estimates of the age class structure of the buck population will be determined primarily (directly) through the use of hunter harvested bucks at checking stations and field bag checks, and secondarily (indirectly) using post-season classification observations.

Harvest - The primary technique used to estimate harvest over the unit is the statewide uniform harvest surveys.

Limiting Factors (May prevent achieving management objectives)

Crop Depredation - Address depredation issues as prescribed by state law and DWR policy. Some geographic populations may be maintained at lower levels than the range can support due to conflicts with crop production and private landscapes.

Habitat – Winter range condition is the major limiting factor on the Morgan-South Rich unit. Conditions range from Poor to Good depending on where you are on the unit. Limiting factors include habitat loss and degradation, increasing ungulate populations, and reduced browse by competition from introduced weedy species. Excessive habitat utilization will be addressed by hunter harvest.

Predation - Consistently high fawn/doe ratios seem to indicate that predation is not a primary limiting factor for deer on the Morgan/South Rich WMU. Coyote removal through a bounty system is currently underway and future fawn/doe ratios will be used to determine if the removal was effective.

Highway Mortality - Cooperate with the Utah Dept. of Transportation in construction of highway fences, passage structures and warning signs.

Illegal Harvest, Crippling Loss, Disease and Parasites - Although poaching losses appear insignificant on the Morgan-South Rich Unit, due primarily to a highly visible law enforcement effort, crippling losses are a concern, especially under buck-only hunting. Disease is very difficult to evaluate, but high mortality is often associated with disease and malnutrition. The animal disease diagnostic facility associated with

Utah State University acts as the laboratory to identify disease problems. Chronic Wasting disease is of further concern though it has not yet been detected on the unit. Surveillance will be implemented by testing hunter harvested animals as well as targeted surveillance of symptomatic animals.

Urban Deer - Continued development across this Unit has led to an increase in nuisance deer complaints. The Urban Deer Control Rule, R657-65, will be used to help municipalities address urban deer issues. Additional hunting opportunities outside of municipal boundaries will also be used to address nuisance complaints.

HABITAT

Habitat Description

The Morgan-South Rich Management Unit 4 incorporates a section of Weber County southeast of Huntsville, the northern halves of Morgan and Summit counties, and the southern portion of Rich County southwest of Woodruff. The unit is dominated by private land in both summer and winter range areas.

Most deer winter range is located in the major drainages and on the slopes north of the Weber River. A detached, smaller wintering area is found on the south-facing slopes above Cottonwood Creek. These areas are becoming highly developed. Highways I-80 and I-84, which run through Echo Canyon and along the Weber River, form the unit's southern boundary. There are several towns along the highways. Surrounding Croydon, the majority of the Lost Creek bottoms have been converted to alfalfa fields. Two areas of land in the unit are managed by the Division of Wildlife Resources. The Round Valley WMA is north of I-84, just east of Morgan. The Henefer-Echo WMA is located east of Henefer and is managed primarily as a big game habitat. Controlled grazing, vehicle restrictions, and revegetation projects are major management tools in this area.

Earlier inventory studies described six vegetation types. The sagebrush type is most common and is found over the whole area. It forms part of a continuum, based on moisture conditions, between the mountain browse/sagebrush and mountain browse types. The lower elevation sagebrush and mountain browse/sagebrush types are productive and utilized heavily by deer, while the mountain browse type mostly provides cover and is unavailable in many winters. The other vegetation types occupy comparatively little area, but have the potential to increase. Burns occur frequently in the unit and, unless seeded, production of desirable species is very low. Deer use the burned areas infrequently, possibly because of lack of cover. A small population of mahogany is in Cottonwood Canyon, but it is important to wintering deer. The scattered juniper areas are also important in providing thermal cover, but provide little forage.

In severe winters, the area of available winter range is greatly reduced. The upper limit is 6,500 feet on most of the unit. The available acreage of all vegetation types, except agricultural land, is reduced during severe winters. All range trend studies in the unit were established on winter range. Most studies sample crucial and/or heavily used areas.

The Lost Creek, Weber River, and Echo Canyon areas are traditional deer wintering areas. There is considerable migration both from higher elevations in the unit and from other herd units to this area, especially during severe winters. The largest numbers of deer probably come from the East Canyon Unit, where deer summer on the east side of the Wasatch Mountains. Development in Morgan Valley is disrupting this migration route. Deer also come from the Ogden and Chalk Creek units which also have adequate summer range, but limited winter range.

Habitat Concerns

The summer mule deer habitat is mostly at higher elevations across the unit. Many deer summer on the adjacent East Canyon, Chalk Creek and Ogden units.

Lower elevation winter range is the major limiting factor for mule deer populations on the Morgan-South

South-Rich Unit. The winter range areas are also those areas that are most at risk. Development and urbanization continues to be an ever increasing issue. Habitat loss in the Morgan County area is due to increased urbanization and home development. Most of the increase in home building is occurring on the foothills in what was historic deer winter range. More wide spread habitat concerns on the Morgan-South Rich Unit is the reduction in habitat quality due to the loss of critical browse species (sagebrush, bitterbrush etc). This loss has been attributed to a number of factors, fire, agriculture, drought etc. However, the abundance of weedy annual grass species, and the increase of the exotic, weedy, perennial grass bulbous bluegrass are the more likely causes of sagebrush decline. With the majority of the unit being private lands, conversion of browse to grass for cattle grazing has been a long standing effort. The grasses and other weedy species can form dense mats of cover that compete with seedling and young sagebrush plants, which limits establishment of new sagebrush plants into the population. As the sagebrush population matures, decadence increases and density decreases as old plants begin to die. Annual grass species such as cheat-grass can also increase fuel loads and increase the chance of a catastrophic fire event. One of the factors in re-establishment of browse species is dealing with an overabundance of introduced perennial grass species such as crested wheatgrass and intermediate wheatgrass. Due to grazing practices, the grasses tend to dominate an aggressively grazed area where they are present. Dealing with the perennials with herbicide seems to limit competition and aids in browse establishment. This challenge needs to be dealt with on projects where these grasses are present.

In addition to the continual stresses put on the winter range by development and loss of browse species to invasive weeds, elk are pioneering into available winter range increasing the threat of over use of available forage. As space that is available for winter habitat is reduced, overuse of available resources on remaining winter range is threatened to over browsing. This can lead to future concerns in health and productivity of vegetative browse species available on the winter range. In heavy winter years, these ranges may be over utilized by ungulate populations and may lead to higher winter mortality from malnutrition during years of heavy snow accumulation.

The Rich area of the Morgan-South Rich Unit shares the same summer range as the Cache area. The area around Randolph and Woodruff has not experienced significant development and is not likely to in the future.

Mule deer winter range habitat has seen a decrease in sagebrush density. Causes of sagebrush decline are varied and multiple causes may have compounded effects on the low potential studies in this unit. The moderate drought in recent years has likely caused increased stress on plants, and negatively impacted them. Sagebrush age structure across the area is generally old and one age class. The lack of regeneration of the stand through establishment of young sagebrush is a concern. Annual grass species are present but not prevalent through most of the areas. However, the range trend does show increases of weedy species such as cheat-grass and bulbous bluegrass in many of the low potential studies in this unit. Perennial grass and forb species have increased on many of the studies as browse species decline, and may compete with browse establishment. Grazing practices have an impact on browse species recruitment, both positive and negative. Working with private landowners and federal agencies to promote positive grazing practices that are appropriate to specific areas will be beneficial for browse re-establishment and enhancement. A diverse browse component is essential to healthy and productive winter mule deer habitat.

Crucial mule deer habitat in some areas on the Morgan-South Rich Unit is also being lost and degraded through Juniper expansion. In certain areas where juniper stands occur, the spread and invasion of young juniper have had a dramatic negative impact on existing browse and other understory species

Habitat Management

Loss of critical winter ranges to development is the highest cause of loss of mule deer habitat in the Morgan/South Rich Unit. The loss of sagebrush and other browse species on the remaining winter range is important when considering habitat quality. Contributing factors to the loss of browse species such as the impact of the increase in weedy species, particularly annual grasses, juniper expansion, lack of browse regeneration and other variables are all of a concern in the habitat management of the

Morgan/South Rich Unit.

To address the direct loss of habitat, efforts will be made towards the protection and conservation of remaining mule deer habitat. Efforts must be made to work with counties, cities, private landowners and federal agencies to maintain and protect critical and existing winter range from future losses. Through existing partnerships and developing new conservation partners efforts are being made to identify and prioritize critical habitat areas. Efforts to develop conservation easements and possible DWR acquisitions is important to maintain critical habitat for mule deer. Conservation easements will be an important part of this effort. Other conservation efforts are ongoing throughout the unit.

To address habitat quality and degradation, habitat improvement projects have been and will continue to be planned throughout the unit. Habitat projects have been and are being done on UDWR Wildlife Management Areas, and private lands throughout the unit. The habitat projects are designed to address the specific issues within each project area. Recent past projects have included annual grass control and shrub plantings on the Henefer-Echo WMA.

Habitat projects addressing the encroachment of Juniper are critical to maintaining and increasing winter mule deer habitat. Tools such as chaining, bullhog, lop and scatter and tebuthiron (an herbicide) should be utilized in areas where they would be most beneficial. Planting of browse species such as black (*Artemisia nova*), Wyoming (*Artemisia tridentata Wyomingensis*) and Mountain (*Artemisia tridentata vaseyana*) sagebrush, Antelope Bitterbrush (*Purshia tridentata*) and Mountain Mahogany (*Cercocarpus ledifolious*, *Cercocarpus montanus*) are critical and should be used where the ecological site descriptions dictate their use.

The following are some of the areas that have been targeted for habitat projects within the unit over the next five years.

- Henefer-Echo WMA winter range rehabilitation and enhancements through scalping and hand planting browse species.
- Juniper removal on winter range in Rich county.

PERMANENT RANGE TREND SUMMARIES

Purpose of Range Trend Studies

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 are located on deer and elk winter ranges. Range trend data are used for habitat improvement planning purposes.

Objective

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 and Benefits

Range trend studies are resurveyed every five years, and vegetation condition and trend assessments are made for key areas.

Summary and Excerpts of 2016 Range Trend Result

Unit 4 Morgan/South Rich

Range Trend studies have been sampled within WMU 4 on a regular basis since 1984, with studies being added or suspended as was deemed necessary. Due to changes in sampling methodologies, only data collected following the 1992 sample year is included in this summary. Monitoring studies of WRI projects began in 2004, when possible; WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment. Due to the long-term nature of the studies, many of the Range Trend and WRI studies have had some sort of disturbance or treatment prior to or since study establishment.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Morgan-South Rich Management Unit has continually changed on the sites sampled since 1996. The Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2016 sample year. Shell Hollow improved from very poor-poor to poor condition, Echo Canyon and Tank Canyon remained in poor condition, and Scott Rees Ranch and Wheatgrass Hollow improved from fair to good condition. Heiner's Creek and Chapman Canal remained in good condition, Deseret Main Gate went from good to fair condition, and Woodruff Creek South went from fair to poor. Finally, the Owen's Canyon, Deseret Burn, Harris Canyon, and Above Toon Ranch studies are considered to be in very poor-poor condition generally due to the lack of browse cover, sagebrush diversity, and the presence of annual grasses. The treated study sites range from very poor to good. The treated sites have generally improved as time since treatment has increased; the exception to this is the Claypit South Slope study which has remained in very poor condition. Tank Canyon, Owen's Canyon, and Deseret Burn are also considered to be Range Trend sites and are discussed above. Harris Canyon Dixie was sampled prior to treatment and was in very poor condition. Claypit North Slope improved from fair-good to good and Croydon Cemetery remained in fair condition. It is possible given more time and continual monitoring that these sites will (continue to) improve.

Desirable Components Index: The desirable components index (DCI) for deer was created as a tool to address condition and/or value of winter ranges for mule deer. 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 cover 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 a 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 a 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 grasses cover, 5% perennial forb cover, and less than 5% annual grass cover.

Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 4, Morgan-South Rich.

	1996	2001	2006	2011	2016
■ Excellent	0	0	1	0	0
■ Good	2	5	2	3	4
■ Fair-Good	1	0	1	0	0
■ Fair	3	4	1	3	1
■ Poor-Fair	2	2	1	0	0
■ Poor	2	1	4	4	4
■ Very Poor-Poor	1	0	2	1	2
■ Very Poor	3	2	1	2	2

Number of Study Sites

More detailed information regarding Range Trend data, results, trends, tables and summaries can be found at the Utah's Big Game Range trend Studies web site at <https://wildlife.utah.gov/range-trend.html>

CURRENT POPULATION STATUS

Year	Buck Harvest	Post-Season F/100 D	Post-Season Buck/100 D	Post-Season Population	Population Objective	% of Objective
2013	815	50	27	15,300	18,000	85%
2014	888	67	33	15,500	18,000	86%
2015	923	62	42	18,100	18,000	101%
2016	997	61	33	15,900	18,000	88%

Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 6
(Chalk Creek)
October 2017

BOUNDARY DESCRIPTION

Summit and **Duchesne** counties - Boundary begins at the junction of Interstates 84 and 80 near Echo; then northeast on I-80 to the Utah-Wyoming state line; south and east along this state line to Highway SR-150; south on SR-150 to Pass Lake and the Weber River Trail; west on this trail to Holiday Park and the Weber River road; west on this road to Highway SR-32; north and west on SR-32 to I-80 and Wanship; north on I-80 to I-84 near Echo.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP*

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
U.S Forest Service	0	--	33,719	11%	91	.1%
U.S. Bureau of Land Management	0	--	507	.2%	324	.4%
Utah School and Institutional Trust Lands Administration	0	--	363	.1%	259	.3%
Native American Trust Lands	0	--	0	0%	0	0%
Private	0	--	271,558	88.7%	71,612	96%
U.S. Department of Defense	0	--	0	0%	0	0%
USFWS Refuge	0	--	0	0%	0	0%
National Park Service	0	--	0	0%	0	0%
Utah Division of Parks and Recreation	0	--	0	0%	131	.2%
Utah Division of Wildlife Resources	0	--	0	15%	2,044	3%
TOTAL	0	--	306,147	100%	139,907	100%

UNIT MANAGEMENT GOALS

Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing. Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies. Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- < Target Winter Herd Size – Maintain a target population size of 12,000 wintering deer. This population objective remains for both the short-term (5 year life of this plan) and long term, barring significant changes in range conditions.
- < Herd Composition – Maintain a minimum 3-year average postseason buck to doe ratio of 18-20:100 in accordance with the statewide plan.

Unit 6

1994-2005 Objective:	11,500
2006-2013 Objective:	10,500
2013-2018 Objective:	10,500
2018-2013 Objective:	10,500
<u>2020-2023 Objective:</u>	<u>12,000</u>

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size - Utilizing harvest data, postseason and spring classifications and mortality estimates, a computer model will be used to estimate winter population size. Annual mortality will be estimated based on survival of radio-collared animals on a nearby representative unit.

Buck Age Structure - Estimates of the age class structure of the buck population will be determined primarily (directly) through the use of hunter harvested bucks at checking stations and field bag checks, and secondarily (indirectly) using post-season classification observations.

Harvest - The primary technique used to estimate harvest over the unit is the statewide uniform harvest surveys.

Limiting Factors (May prevent the unit from achieving management objectives)

Crop Depredation - Address depredation issues as prescribed by state law and DWR policy. Some geographic populations may be maintained at lower levels than the range can support due to conflicts with crop production and private landscapes.

Habitat – Winter range condition is the major limiting factor on the Chalk Creek Unit. Winter and summer forage conditions, private land range availability and landowner acceptance will ultimately determine herd size. One factor that is potentially limiting is the increasing population and density of elk on the limited winter range. Elk numbers continue to increase on the unit and occupy and dominate what was once mule deer winter range. Excessive habitat utilization will be addressed by antlerless harvests.

Predation - Consistently high fawn/doe ratios seem to indicate that predation is not a primary limiting factor for deer on the Chalk Creek WMU. Coyote removal through a bounty system is currently underway and future fawn/doe ratios will be used to determine if the removal was effective.

Highway Mortality - UDWR has been working closely with the Utah Department of Transportation to prevent WVC's (wildlife vehicle collisions) in this unit. Several areas have been previously identified as having high WVC's: the I-80 and SR-32 area (especially around Rockport Reservoir and the agricultural fields surrounding I-80 and the Weber River); the I-80 area around the Echo Junction and several miles to the north-east; and Hwy. 150. This agency cooperation has resulted the installation of 8' wildlife exclusion fences, the construction of wildlife escape ramps (along I-80), and the inclusion of wildlife paths under the I-80 Weber River bridge. In addition, a consultant firm completed a wildlife mortality study for UDOT for I-

80 from Salt Lake City to Echo Junction. This study identified additional fencing, escape ramp, and wildlife passage needs throughout the I-80 corridor.

Illegal Harvest, Crippling Loss, Disease and Parasites - Although poaching losses appear insignificant on the Chalk Creek Unit, due primarily to a highly visible law enforcement effort, crippling losses are a concern, especially under buck-only hunting. If illegal kills be identified as a significant source of mortality, specific preventative measures will be developed within the context of an Action Plan. This plan will be developed in cooperation with the Law Enforcement section.

Disease is very difficult to evaluate, but high mortality in the spring is often associated with disease and malnutrition. The animal disease diagnostic facility associated with Utah State University acts as the laboratory to identify disease problems. Chronic Wasting disease is of further concern although it has not yet been detected on the unit. Surveillance will continue to be implemented by testing hunter harvested animals as well as targeted surveillance of symptomatic animals.

Urban Deer - Continued development across this Unit has lead to an increase in nuisance deer complaints. The Urban Deer Control Rule, R657-65, will be used to help municipalities address urban deer issues. Additional hunting opportunities outside of municipal boundaries will also be used to address nuisance complaints.

HABITAT

Habitat Description

The Chalk Creek Management Unit has an estimated 74,461 acres of winter habitat and 306,147 acres of summer habitat for mule deer range. The majority of the range is privately owned (96% of the winter range, 89% of summer range). Widespread private ownership leads to numerous management complications. Development and loss of habitat due to other land disturbances are some of the biggest concerns to mule deer winter range. The discovery, development, and removal of oil throughout the unit, especially the Chalk Creek area, has led to increased road densities and scattered housing developments. New agricultural projects on crucial winter range also continue to increase depredation problems and further decrease the available big game habitat. Because of the preponderance of private land and the establishment of Cooperative Wildlife Management Areas (CWMU's) access is severely restricted for public hunting on large areas.

The topography of the unit is influenced mainly by the Uinta Mountains to the east, with their drainages flowing through long, gradual slopes down into the Weber River Valley. Other major drainages include Crandall Canyon, Chalk Creek, Echo Canyon, Hixon Canyon, Pecks Canyon, and Grass Creek. The southern exposures of these canyons are especially important winter ranges. The rest of the winter range is found in the low rolling foothills of the western and central areas of the unit. The upper limits of the winter range vary between approximately 6,800 and 7,200 feet (Giunta 1979).

Towns located in the valley along the Weber River include: Oakley, Peoa, Wanship, Hoytsville, and Coalville. Echo and Rockport Reservoirs, located on the west side of the unit on the Weber River, are both significant barriers to big game movement. Additionally, I-80 through Echo Canyon discourages big game movement and many deer deaths occur there during winter and spring.

Habitat Concerns

Mule deer habitat on the Chalk Creek Unit is divided between summer range and winter range. The summer range is mostly at higher elevations with the majority of the summer range being on private property. Due to the loss of habitat and the increasing number of elk on the unit, overuse on remaining winter range is a serious threat to the health and productivity of the winter browse species contained in the heavily utilized ranges.

Lower elevation winter range is the major limiting factor for mule deer populations on the Chalk Creek

Unit. The winter range areas are also those areas that are most at risk. Threats to mule deer habitat on the Chalk Creek Unit include the continued loss of acres and the reduction in habitat quality due to the loss of critical browse species (sagebrush, bitterbrush etc). The loss of habitat can be attributed to different factors and may be specific to specific areas. One factor is the expansion of juniper across the winter range particularly from Echo south to Oakley. Other concerns are the direct loss of crucial winter range acres due to development and urbanization. Most of the increase in home building is occurring on the foothills in what was historic deer winter range.

The increasing abundance of weedy annual grass species, and the increase of the exotic, weedy, perennial grass bulbous bluegrass are also contributing factors of sagebrush decline. These weedy species can form dense mats of cover that compete with seedling and young sagebrush plants, which limits establishment of new sagebrush plants into the population. As the sagebrush population matures, decadence increases and density decreases as old plants begin to die. Annual grass species such as cheatgrass can also increase fuel loads and increase the chance of a catastrophic fire event.

Habitat Management

Loss of critical winter ranges to development is the highest cause of loss of mule deer habitat in the Chalk Creek unit. The habitat quality of the sagebrush and other browse species on the remaining winter range is important to protect.

To address the direct loss of habitat, efforts will be made towards the protection and conservation of remaining mule deer habitat. Efforts must be made to work with counties, cities, private landowners, non-governmental organizations (NGO's), state and federal agencies to maintain and protect critical and existing winter range from future losses. Through existing partnerships and developing new conservation partners, efforts are being made to identify and prioritize critical habitat areas. Conservation easements will continue to be an important part of this effort. Other conservation efforts are ongoing throughout the unit.

To address habitat quality and degradation, habitat improvement projects have been and will continue to be planned throughout the unit. Habitat projects have been and are being done on UDWR Wildlife Management Areas, and private lands throughout the unit. The habitat projects are designed to address the specific issues within each project area. The major issues are Juniper encroachment and annual grass competition reducing the amount of browse species available to wintering wildlife. This in turn causes over-utilization of remaining browse, causing degeneration of existing plants. Recruitment of browse plants is also a concern due to annual grasses and over utilization by removing immature plants. Areas such as Crandall Canyon and the surrounding drainages are very dense in Juniper and are prime areas for Juniper removal projects, utilizing chaining, lop and scatter, bullhog and other accepted methods for thinning and removing Juniper.

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 709 acres of land have been treated within the Chalk Creek unit since the WRI was implemented in 2004; 1,168 acres are currently undergoing treatment projects. Treatments frequently overlap one another bringing the total completed treatment acres to 709 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

The following are some of the areas that have been targeted for habitat projects within the unit over the next five years.

- Crandall Canyon winter range rehabilitation and pinyon/juniper (PJ) tree removal.
- South Fork PJ thinning and winter range enhancement.
- A particular focus of treatment area is the expanding juniper that dominates the crucial winter ranges from Echo south to Oakley. Those areas of Phase I and II juniper will be targeted. The challenge is to find multiple cooperative landowners in a given area, where larger projects can be done.

PERMANENT RANGE TREND SUMMARIES

Purpose of Range Trend Studies

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.

Statewide, the majority of the permanent range trend transects are located on deer and elk winter ranges. The range trend data resulting from these studies are used for habitat improvement and planning purposes.

Objective

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 and Benefits

Range trend transects are resurveyed every five years, and vegetation condition and trend assessments are made for key areas.

Summary and Excerpts of 2016 Range Trend Result

Unit 6 Chalk Creek

Range Trend studies have been sampled within WMU 6 on a regular basis since 1984, with studies being added or suspended as was deemed necessary. Due to changes in sampling methodologies, only data collected following the 1992 sample year is included in this summary. Monitoring studies of WRI projects began in 2004, when possible; WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment. Due to the long-term nature of the studies, many of the Range Trend and WRI studies have had some sort of disturbance or treatment prior to or since study establishment.

The condition of deer winter range within the Chalk Creek management unit has continually changed on the sites sampled since 1996. The Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the most recent sample years. Crandall Canyon, North Oakley Bench, and Mahogany Hills improved from fair or fair-good to good condition. Anshutz Ranch went from good to fair condition, and Stag Canyon remained in poor condition. The Echo Canyon Rest Area, Spring Hollow Burn, and Spring Canyon studies are considered to be in very poor or very poor-poor condition generally due to the lack of preferred browse cover and sagebrush diversity. The treated study sites range from very poor-poor to poor condition; Echo Canyon Rest Area is also considered to be a Range Trend site and is therefore discussed above. Lower Crandall Canyon was not sampled prior to treatment, but is in very poor condition upon the first post-treatment sampling due to lack of preferred browse cover and sagebrush diversity. It is possible given more time and continual monitoring that these sites will continue to improve.

Desirable Components Index:

The desirable components index (DCI) for deer was created as a tool to address condition and/or value of winter ranges for mule deer. 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 cover 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 a 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 a 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 grasses cover, 5% perennial forb cover, and less than 5% annual grass cover.

Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 6, Chalk Creek.

	1996	2001	2006	2011	2016
■ Good	4	1	1	3	1
■ Fair-Good	0	0	1	0	0
■ Fair	2	4	4	2	1
■ Poor-Fair	0	1	0	0	0
■ Poor	0	0	0	1	1
■ Very Poor-Poor	0	1	1	1	2
■ Very Poor	3	2	3	2	0

Number of Study Sites

More detailed information regarding Range Trend data, results, trends, tables and summaries can be found at the Utah's Big Game Range trend Studies web site at <https://wildlife.utah.gov/range-trend.html>

Current Population Status

Year	Buck Harvest	Post-Season F/100 D	Post-Season Buck/100 D	Post-Season Population	Population Objective	% of Objective
2014	957	68	36	15,000	10,500	143%
2015	1,038	65	42	18,300	10,500	174%
2016	1,175	60	30	15,700	10,500	150%

Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 8
North Slope
October 2020

BOUNDARY DESCRIPTION

Daggett and Summit counties--Boundary begins SR-150 and the Summit-Duchesne county line at Hayden Pass (summit of the Uinta Mountains); north on SR-150 to the Utah-Wyoming state line; east on this state line to the Utah-Colorado state line; south on this state line to the Green River; west along this river to Flaming Gorge Reservoir; west along the south shoreline of this reservoir to Cart Creek; south along this creek to US-191; south on US-191 to the Uintah-Daggett County line (summit of the Uinta Mountains); west along the summit of the Uinta mountains to SR-150 at Hayden Pass.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP – August 2016

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	4780	65	494914	87	76070	42
Bureau of Land Management	0	0	20033	4	43202	24
Utah State Institutional Trust Lands	302	4	7819	1	19276	11
Native American Trust Lands	0	0	0	0	0	0
Private	2249	31	45825	8	37188	21
Department of Defense	0	0	0	0	0	0
Utah State Parks	0	0	0	0	0	0
Utah Department of Transportation	0	0	0	0	9	<1
Utah Forestry, Fire & State Lands	0	0	0	0	2	<1
Utah Division of Wildlife Resources	7	<1	989	<1	4627	2
TOTAL	7338	100	569580	100	180374	100

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Expand and improve mule deer populations within the carrying capacity of available habitats and in consideration of other land uses.
- Conserve and improve mule deer habitat throughout the unit with emphasis on crucial ranges.

POPULATION MANAGEMENT OBJECTIVES

Manage for a target population of 10,000 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range trend data coupled with annual browse monitoring will be used to assess habitat condition. Biologists will continue to carefully monitor winter ranges and make recommendations to improve and protect winter habitat. Should over-utilization and range damage by deer occur, recommendations will be made to reduce deer populations to sustainable levels in localized areas. When available, annual Body Condition Scores (BCS) based on body fat measurements for deer on the unit or adjacent/representative units will be used to assess herd health. The need for antlerless harvest will be based on BCS and range condition.

- < **Target Winter Herd Size** – The objective is 10,000 wintering deer.
- < **Herd Composition** - Buck:doe ratios will follow the statewide mule deer management plan, which is currently set at 18 to 20 bucks per 100 does for the North Slope Unit.
- < **Harvest** - Continue general season unit by unit buck deer hunt management, using archery, any weapon, and muzzleloader hunts. Buck permits will be adjusted to maintain buck:doe ratio objectives.

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size – The population size will be estimated utilizing harvest data, postseason and spring classifications, and radio-collar based survival estimates.

- < **Harvest** - The primary means of monitoring harvest will be through the statewide uniform harvest survey. Antlerless hunts will be used to reduce deer densities in areas where habitat damage is occurring due to overpopulation and in areas where depredation is an issue. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck to doe ratios.

Strategies to address Limiting Factors:

- < **Crop Depredation** – Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- < **Deer Distribution** – Targeted antlerless hunts, mitigation permits/vouchers, and agency removal and/or trap and cull operations may be used to address unnaturally high concentrations of deer in the city of Manilla. DWR will continue to work with Manilla city leadership to address this issue.
- < **Habitat** – Winter range forage conditions, public land range availability and landowner acceptance will determine herd size. Excessive habitat utilization will be addressed with antlerless hunting.
- < **Predation** – DWR will follow the strategies outlined in the predator management policy.
- < **Highway Mortality** – Highway mortality is a significant factor in reduced population growth in deer. DWR will work with UDOT, Summit and Daggett counties, Universities, local conservation groups, and landowners to minimize highway mortality by identifying locations of high deer-vehicle collisions and erecting sufficient wildlife crossing structures in those locations. DWR will evaluate the effectiveness of the crossing structures over time and implement new technologies to improve future wildlife crossing structures.

- < Disease – The impact of disease on deer herds is difficult to assess. Monitoring will continue for diseases that have been found in the state including bluetongue, epizootic hemorrhagic disease (EHD), pneumonia, enterotoxemia, and chronic wasting disease (CWD). CWD has been documented on the North Slope Unit. DWR will Continue surveillance through check stations and other methods to document prevalence, and location of positive animals in accordance with the statewide CWD plan.
- < Illegal Harvest - Support law enforcement efforts to educate the public concerning poaching and reduce illegal taking of deer.

HABITAT MANAGEMENT OBJECTIVES

- < Protect, maintain and/or enhance forage production through direct range improvements throughout the unit to achieve herd population management objectives. Minimize and mitigate impacts from energy development activities. Minimize deer vehicle collisions along highways on the unit.
- < Work with private landowner and federal, state and local government agencies to maintain and protect critical and existing winter range from future losses and degradation through grazing management and OHV and Travel Plan modifications.
- < Work with federal, private, and state partners to improve crucial deer habitats through the Watershed Restoration Initiative (WRI) process. Also work with federal and state partners in fire rehabilitation on crucial deer habitat through the WRI process.
- < Maintain and protect critical winter range from future losses. Preserve, protect and/or acquire critical winter range when the opportunity arises.
- < Provide improved habitat security and escapement opportunities for deer.

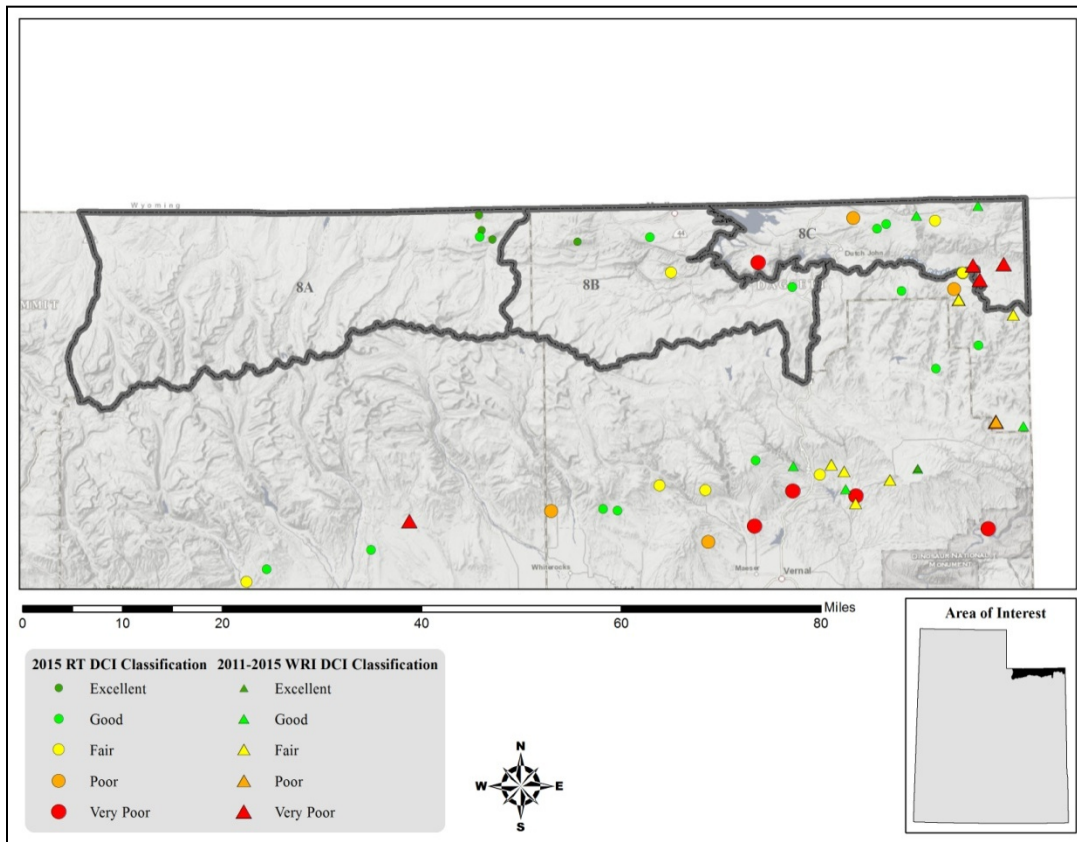
HABITAT MANAGEMENT STRATEGIES

- < The Richard Mountain fire burned approximately 7,633 acres in 2020, about half of that in Utah. It burned in crucial summer and winter habitats for deer. Working with land managers to restore and improve these burned areas will be a top priority.
- < Continue to improve, protect, and restore sagebrush steppe habitats critical to deer. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, grazing management, water developments, etc. on public and private lands. Habitat improvement projects will occur on both winter ranges as well as summer range.
- < Continue to monitor permanent range trend studies located throughout the herd unit.
- < Conduct cooperative seasonal range rides and surveys to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.
- < Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of conservation easements on private lands.
- < Work with land management agencies, conservation organizations, private landowners, and local leaders through the regional WRI working groups to identify and prioritize mule deer habitats that are in need of enhancement or restoration.

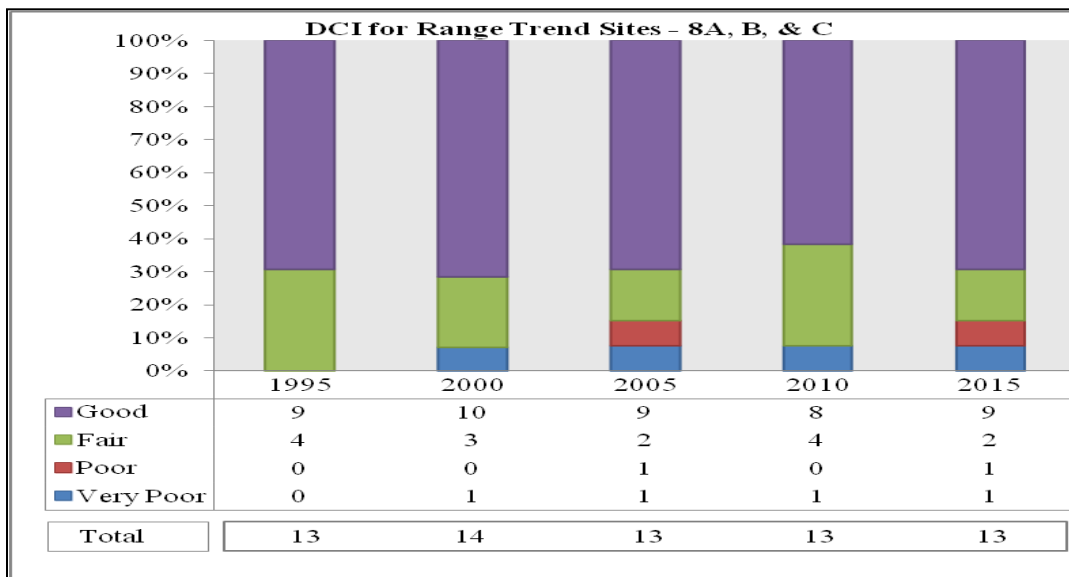
- < Utilize antlerless deer harvest to improve or protect forage conditions if and when vegetative declines are attributed to deer over utilization.
- < Initiate broad scale vegetative treatment projects to improve mule deer habitat with emphasis on drought or fire damaged sagebrush winter ranges, ranges that are being taken over by invasive annual grass species, and ranges being diminished by encroachment of conifers into sagebrush or aspen habitats.
- < Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.
- < Manage vehicle access on DWR lands to limit human disturbance during times of high stress, such as winter and fawning.
- < Manage riparian areas in critical fawning habitat to furnish water, cover, and succulent forage from mid to late summer.
- < Properly manage elk populations to minimize competition with mule deer on crucial ranges.
- < Cooperate with partners to maintain, improve and expand availability of water for deer on the unit using guzzlers, improved springs, and/or other water systems.
- < Reduce expansion of pinion-juniper and other woodlands into sagebrush habitats and improve habitats dominated by pinion-juniper woodlands by completing habitat restoration projects like lop and scatter, bullhog, and chaining.
- < Manage conifer encroachment on important summer ranges by utilizing prescribed fire. Seek opportunities to increase browse in burned areas of critical winter range.
- < Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheat grass with desirable perennial vegetation.
- < Work with state and federal land management agencies to properly manage livestock to enhance crucial mule deer ranges
- < Minimize impacts and mitigate for losses of crucial habitat due to human impacts and energy development. Oil and gas specific habitat biologists will lead this effort.
- < Work with county, state, and federal agencies to limit the negative effects of roads by reclaiming unused roads, properly planning new roads, and installing fencing and highway passage structures where roads disrupt normal mule deer migration patterns.

PERMANENT RANGE TREND SUMMARIES

Distribution of Range Trend study sites in the North Slope Unit:



Trend of deer winter range condition on Unit 8 as indicated by DWR permanent Big Game Range Trend studies:



Condition of deer winter range on Unit 8 as indicated by DWR range trend surveys:

8bc (West Daggett & Three Corners)

Year	Mean DCI Score for Unit	Classification	Unit-specific DCI Score Range: Low	Unit-specific DCI Score Range: Mid	Unit-specific DCI Score Range: High
1995	74	Good	65	76	76
2000	70	Good	57	74	81
2005	64	Good	54	60	85
2010	68	Good	52	63	87
2015	66	Good	21	75	90

8a (Summit)

Year	Mean DCI Score for Unit	Classification	Unit-specific DCI Score Range: Low	Unit-specific DCI Score Range: Mid	Unit-specific DCI Score Range: High
1995	90	Good	-	-	90
2000	93	Excellent	-	-	93
2005	88	Good	-	-	88
2010	93	Excellent	-	-	93
2015	94	Excellent	-	-	94

APPENDIX

Unit 8bc, North Slope, Daggett and Three Corners subunits

Overall range trend within these subunits is good. Some areas within this subunit suffered a sagebrush die-off, primarily due to the extensive seven-year drought. This is reflected in the DCI rating for these sites.

There are ten permanent winter range trend study sites on this portion of the unit. In 2010, two sites had a higher Desired Components Index figure showing an improvement in habitat quality. Study sites in the low ecological potential had a slight decrease in their DCI rating, while the mid potential was up slightly. The overall DCI rating is "Good" at 66 for 2015, which is down from 68 found in the year 2010.

The Utah Division of Wildlife Resources Big Game Range Inventory crew read a total of 10 range trend study sites during 2015. Three sites had improving browse trend, 4 were stable and 3 had declining trends due to drought conditions and/or increases in annual grasses. Overall, the majority of the sites are in good condition. The key browse species are principally Wyoming big sagebrush, mountain big sagebrush and mountain browse species such as true mountain mahogany. Areas where sagebrush is the key species have remained stable, but recruitment of young plants has generally remained low. The perennial forb understories associated with mountain big sagebrush and Wyoming big sagebrush have stayed low, but have shown stable to upward trends for perennial grasses. Annual grasses, namely cheatgrass, have increased across sites, placing sites at increased risk for fire.

Two additional range trend sites located in Brown's Park, south of the Green River, are technically in the South Slope Diamond Mountain subunit, but can be used to show range trend on the Three Corners Subunit. They both show fair DCI ratings, and both have low potential ecological potential.

Essential vegetation types monitored include Mountain big sagebrush, Wyoming big sagebrush and mountain brush (which includes bitterbrush, mountain mahogany, curleaf mahogany and service berry).

Unit 8a, North Slope, Summit Subunit

The steep slopes on the study sites have high erosion potential. However, the understory, especially the bunch grasses, is dense and vigorous and provides adequate soil stabilization. Browse trends on the unit for the key browse species, mountain mahogany, are stable to slightly up. The sites in this area all show a stable to slightly increasing trend. The slight upward trend in the last 5 years is probably a result of increased precipitation. The overall DCI rating is excellent.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 9
South Slope
October, 2020

BOUNDARY DESCRIPTION

Wasatch, Summit, Daggett, Uintah, Duchesne counties - Boundary begins at the Junction of US-40 and SR-87 in Duchesne; north on SR-87 to SR-35; northwest on SR-35 to the Provo River; north along the Provo River to the North Fork Provo River; north along the North Fork Provo River to SR-150; north along SR-150 to the Summit/Duchesne county line (summit of the Uinta Mountains); east along the summit of the Uinta Mountains to US-191; north along US-191 to Cart Creek; north along Cart Creek to Flaming Gorge Reservoir; east along Flaming Gorge Reservoir to the Green River; east along the Green River to the Utah-Colorado state line; south along the Utah-Colorado state line to the White River; west along the White River to the Green River; north along the Green River to the Duchesne River; west along the Duchesne River to US-40 at Myton; west along US-40 to SR-87 in Duchesne.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	69	0%	873,235	76%	39,946	7%
Bureau of Land Management	33,042	6%	94,873	8%	183,516	31%
Utah State Institutional Trust Lands	16,195	3%	8,848	1%	36,543	6%
Native American Trust Lands	102,738	20%	35,291	3%	200,458	34%
Private	342,288	66%	108,133	9%	107,791	18%
USFWS Refuge	5,737	1%	0	0%	0	0%
National Parks	9,576	2%	7,925	1%	11,706	2%
Utah State Parks	346	<1%	0	0%	4,050	1%
Utah State Lands & Forestry	69	<1%	0	0%	0	0%
US Bureau of Reclamation	659	<1%	0	0%	0	0%
Utah Division of Wildlife Resources	897	<1%	13,716	1%	2,994	1%
TOTAL	950,681	100%	1,140,008	100%	731,950	100%

UNIT MANAGEMENT GOALS

Manage the deer population at a level capable of providing a broad range of recreational opportunities, including hunting and viewing.

Balance deer herd goals and objectives with impacts on human needs, such as private property rights, agricultural crops and local economies.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Manage for a target population of 24,000 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range trend data coupled with annual browse monitoring will be used to assess habitat condition. Biologists will continue to carefully monitor winter ranges and make recommendations to improve and protect winter habitat. Should over-utilization and range damage by deer occur, recommendations will be made to reduce deer populations to sustainable levels in localized areas. When available, annual Body Condition Scores (BCS) based on body fat measurements for deer on the unit or adjacent/representative units will be used to assess herd health. The need for antlerless harvest will be based on BCS and range condition.

Long Term Target Winter Herd Size – population size of 24,000 wintering deer (modeled number) distributed in the following subpopulations:

- 9a	Yellowstone subpopulation:	11,000
- 9b,c&d	Vernal/Bonanza and Diamond Mountain subpopulations:	13,000

- **Herd Composition** – The Yellowstone and Vernal/Bonanza subunits are General Season subunits and will be managed for a 3-year average postseason buck to doe ratio in accordance to the statewide deer plan. 9a is managed for 18-20 bucks per 100 does. 9b,d is managed for 15-17 bucks per 100 does).

The Diamond Mountain subunit 9c will be managed as a Limited Entry hunting unit, with a 3 year average postseason buck to doe ratio objective ranging from 25 to 35 bucks per 100 does.

Harvest – Continue general season unit by unit buck deer hunt management, using archery, any weapon and muzzleloader hunts. Buck permits will be adjusted to maintain buck-doe ratio objectives. Antlerless permits will be issued to address specific localized range degradation concerns or crop depredation.

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size - Winter population size will be estimated using a model that was developed to utilize harvest data, postseason and spring classifications and radio-collar based survival estimates. Annual survival rates for adult does and doe fawns will be monitored by capturing and radio collaring at least 20 doe fawns each December across the unit and monitoring survival rates into adult hood. A minimum of 50 collared adult females will be maintained across the unit to monitor adult survival.

Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey. We recognize that buck harvest may be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck:doe ratios.

Strategies to address Limiting Factors:

Crop Depredation - Minimize depredation as prescribed by state law and DWR policy.

Habitat - Public land winter range availability, landowner acceptance and winter range forage conditions will determine herd size. Excessive habitat utilization will be addressed with antlerless deer hunts to lower populations in localized areas.

Predation - DWR will follow the strategies outlined in the predator management policy.

Highway Mortality - Highway mortality is a significant factor in reduced population growth in deer. Work should continue in cooperation with UDOT, Uintah and Duchesne counties, universities, local conservation groups, and landowners to minimize highway mortality by identifying locations of high deer-vehicle collisions and erecting sufficient wildlife crossing structures in those locations. Evaluate the effectiveness of the crossing structures over time and implement new technologies to improve future wildlife crossing structures.

Disease - The impact of disease on deer herds is difficult to assess. Monitoring will continue for diseases that have been found in the state including bluetongue, epizootic hemorrhagic disease (EHD), pneumonia, enterotoxemia and chronic wasting disease (CWD). CWD has been documented on the South Slope, Yellowstone subunit. The DWR will continue surveillance through check stations and other methods to document prevalence, and location of positive animals. Targeted hunts in localized areas may be developed to accomplish additional CWD sampling, to reduce localized deer densities and/or buck-to-doe ratios in an effort to address disease hotspots in accordance with the statewide CWD plan.

Illegal Harvest - Support law enforcement efforts to educate the public concerning poaching and reduce illegal taking of deer.

HABITAT MANAGEMENT OBJECTIVES

Protect, maintain, and/or improve deer habitat through direct range improvements to support and maintain herd population management objectives.

Work with private landowners and federal, state, and local governments to maintain and protect critical and existing ranges from future losses and degradation through grazing management and OHV and Travel Plan modifications.

Work with federal, private, and state partners to improve crucial deer habitats through the Watershed Restoration Initiative (WRI) process. Priority will be given to areas affected by the 2003 sagebrush die off and burned areas that are now dominated by cheat grass.

Work with federal and state partners in fire rehabilitation on crucial deer habitat through the WRI process.

Maintain and protect critical winter range from future losses. Preserve, protect and/or acquire critical winter range when the opportunity arises.

Minimize and mitigate impacts from energy development activities. Minimize deer vehicle collisions along highways on the unit.

HABITAT MANAGEMENT STRATEGIES

The East Fork fire burned approximately 86,000 acres on the Yellowstone sub-unit in 2020, making it one of the largest fires in Utah in modern history. It burned in both crucial summer and winter habitats for deer. Working with land managers to control weeds, restore desired plant communities

and improve these burned areas will be a top priority.

Continue to improve, protect, and restore sagebrush steppe habitats critical to deer. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, grazing management, water developments, etc. on public and private lands. Habitat improvement projects will occur on both winter ranges as well as summer range. Priority will be given to areas affected by the 2003 sagebrush die off and burned areas that are now dominated or threatened by cheat grass.

Continue to monitor permanent range trend studies located throughout the unit.

Conduct cooperative seasonal range assessments to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.

Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of conservation easements on private lands.

Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.

Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities. Oil and gas specific habitat biologists will lead this effort. Continue to monitor deer survival on this unit through radio telemetry studies. Use telemetry data to determine potential habitat improvement projects.

Manage vehicle access on DWR lands to limit human disturbance during times of high stress, such as winter and fawning.

Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid to late summer.

Cooperate with partners to maintain, improve and expand availability of water for deer on the unit using guzzlers, improved springs, and/or other water systems.

Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheat grass with desirable perennial vegetation.

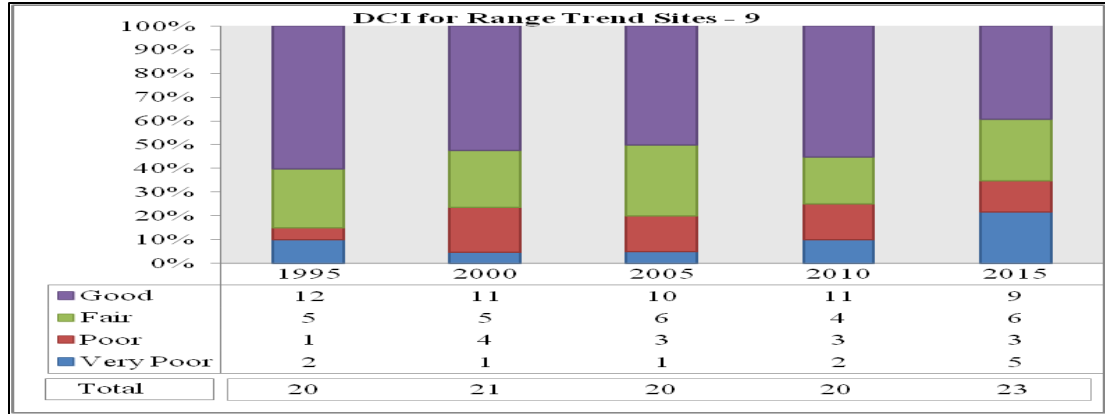
Reduce expansion of pinion-juniper and other woodlands into sagebrush habitats and improve habitats dominated by pinion-juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.

Manage conifer encroachment on important summer ranges by utilizing prescribed fire. Seek opportunities to increase browse in burned areas of critical winter range.

Utilize antlerless deer harvest to improve or protect forage conditions when vegetative declines are attributed to deer over utilization.

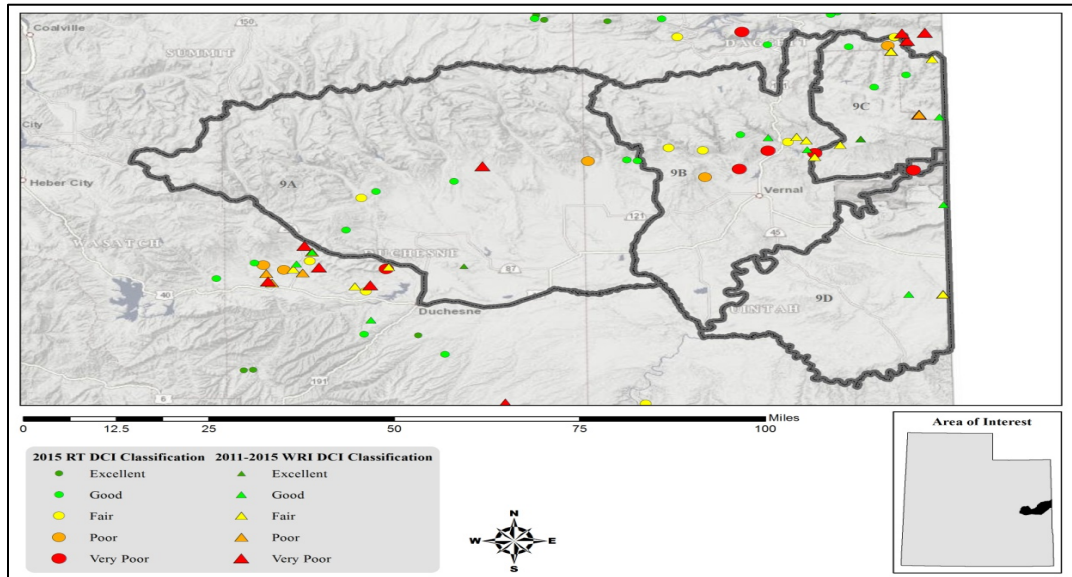
PERMANENT RANGE TREND SUMMARIES

The following graph shows the trend of deer winter range condition on Unit 9, as indicated by DWR permanent Big Game Range Trend studies:



Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for Unit 9, South Slope.

Based upon the 2015 range trend studies the overall condition of the South Slope deer unit is currently considered to be declining slightly. The most critical winter range areas are the Wyoming Big Sagebrush areas which are currently only in Fair-Poor condition. These are the areas with the lowest potential and are reflective of the sagebrush die-off that occurred in 2003. These low potential sites are located on the most critical winter range where deer are pushed to on hard winters. Serious range condition problems exist in some of this zone, particularly on the South Slope, Vernal Subunit (9b). This map shows the distribution of the poor rated range trend monitoring sites across the South Slope in red.



2015 Desirable Components Index (DCI) ranking distribution by study site for WMU 9, South Slope. Triangle shaped points indicate Watershed Initiative treatment sites.

Those areas where the range condition is currently in the Poor or Very Poor condition need to be addressed and utilization minimized until range condition can be improved.

APPENDIX

Subunit Boundary descriptions:

Unit 9a South Slope, Yellowstone Subunit

Wasatch, Summit, Duchesne, Uintah counties -- Boundary begins at SR-87 and US-40 in Duchesne; north on SR-87 to SR-35; northwest on SR-35 to the Provo River; north along this river to North Fork Provo River; north along this river to SR-150; east and north on SR-150 to the Summit-Duchesne county line (summit of the Uinta Mountains) at Hayden Pass; east along the summit of the Uinta Mountains to the Dry Fork-Whiterocks drainage divide; south atop this divide to USFS Trail #025; southwest on this trail to Whiterocks Lake and the East Fork of the Whiterocks River; south along this river to the Whiterocks River; south along this river to the Uinta River; south along this river to the Duchesne River; west along this river to US-40 at Myton; west on US-40 to SR-87 in Duchesne.

Unit 9b South Slope, Vernal Subunit

Daggett and Uintah counties -- Boundary begins at the Dry Fork-Whiterocks drainage divide and the Daggett-Uintah county line (summit of the Uinta Mountains); east along the summit of the Uinta Mountains to US-191; north along US-191 to Cart Creek; north along Cart Creek to Flaming Gorge Reservoir; east along Flaming Gorge Reservoir to the Green River; east along the Green River to Gorge Creek; south along Gorge Creek to the summit and the head of Davenport Draw; south along the USFS-Private Land boundary on the west side of Davenport Draw and continuing south along this USFS boundary to the BLM boundary on the Diamond Mountain rim; southeast along the Diamond Mountain rim to the Diamond Mountain road (Jones Hole Road); southwest along this road to the Brush Creek road; south along this road to the Island Park/Rainbow Park road; east along this road to the Dinosaur National Monument boundary; northeast along this boundary to the Utah-Colorado state line; south along this state line to the Green River; south along this river to the Duchesne River; north along this river to the Uinta River; north along this river to Whiterocks river; north along this river to the East Fork of the Whiterocks River; north along this river to Whiterocks Lake and USFS Trail #025; northeast on this trail to the Dry Fork-Whiterocks drainage divide; north atop this divide to the Daggett-Uintah county line (summit of the Uinta Mountains).

Unit 9c South Slope, Diamond Mountain Subunit

Daggett and Uintah counties -- Boundary begins at the Utah-Colorado state line and the Green River at Browns Park; west along this river to Gorge Creek; south along this creek to the summit and the head of Davenport Draw and the USFS boundary; south on this boundary on the west side of Davenport Draw and continuing south on this boundary to the BLM boundary on the Diamond Mountain Rim; east and south along this rim to the Diamond Mountain road (Jones Hole Road); south and west on this road to the Brush Creek road; south on this road to the Island Park/Rainbow Park road; east on this road to the Dinosaur National Monument boundary; north and east on this boundary to the Utah-Colorado state line; north on this state line to the Green River.

Unit 9d South Slope, Bonanza Subunit

Uintah County -- Boundary begins at the Utah-Colorado state line and the White River; west along this river to the Green River; north along this river to the Colorado-Utah state line; south along this state line to the White River.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 10
Book Cliffs
October, 2020

BOUNDARY DESCRIPTION

Grand and Uintah counties—Boundary begins at Exit 164 on I-70 near the town of Green River; east on I-70 to the Utah-Colorado state line; north on this state line to the White River; west along this river to the Green River; south along this river to Swasey's Boat Ramp and the Hastings Road; south on this road to SR-19; south and east on SR-19 to Exit 164 on 1-70 near the town of Green River. **EXCLUDES ALL NATIVE AMERICAN TRUST LAND WITHIN THE BOUNDARY.**

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	0	0%	0	0%
Bureau of Land Management	145453	62%	160399	34%	899786	66%
Utah State Institutional Trust Lands	33770	14%	127776	27%	119242	9%
Native American Trust Lands	51816	22%	161229	35%	253474	19%
Private	4216	2%	9608	2%	90387	7%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	0	0%	6518	1%	1689	0%
TOTAL	235255	100%	465531	100%	1364578	100%

UNIT MANAGEMENT GOALS

Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing. Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies. Maintain the population at a level that is within the long-term capability of the available habitat.

POPULATION MANAGEMENT OBJECTIVES

- < Maintain a healthy mule deer population within the long term carrying capacity of the available habitat. Range trend data coupled with annual browse monitoring will be used to assess habitat condition. Biologists will continue to carefully monitor winter ranges and make recommendations to improve and protect winter habitat. Should over-utilization and range damage by deer occur, recommendations will be made to reduce deer populations to sustainable levels in localized areas. When available, annual Body Condition Scores (BCS) based on body fat measurements for deer on the unit or adjacent/representative units will be used to assess herd health. The need for antlerless harvest will be based on BCS and range condition.
- < Manage the deer population at a level capable of providing a broad range of recreational opportunities, including hunting and viewing.
- < Balance deer herd goals and objectives with impacts on human needs, such as private property rights, agricultural crops and local economies.

Target Winter Herd Size – Manage for a target population size of 9,000 wintering deer (modeled number) distributed in the following subpopulations:

Bitter Creek, Subunit 10A:	6,000
South, Subunit 10B:	3,000
Unit 10 Total:	9,000

(Subunit boundary descriptions are provided in the Appendix)

- < Herd Composition and Harvest – The Book Cliffs will be managed as a Limited Entry buck deer hunting unit, with a 3 year average postseason buck to doe ratio objective ranging from 25 to 35 bucks per 100 does. If buck to doe ratios are significantly different on the northern and southern subunits, hunting permits for the rifle season may be adjusted between subunits to better distribute hunter pressure and buck deer harvest. Furthermore, changes to season dates, hunt boundaries, and implementing creative hunt strategies may be explored to ensure that large disparities in buck to doe ratios on subunits are addressed, while maintaining quality on the unit.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- < Population Size - Utilizing harvest data, postseason & spring classifications, and GPS collar mortality estimates, a model has been developed to estimate winter populations. Wintering populations may be modeled separately for each subunit when appropriate.
- < Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey. Buck harvest strategies are developed through the Statewide Deer Plan process and approved by the Wildlife Board to achieve management objectives for buck/doe ratios. A committee was formed to provide a strategy to harvest more bucks on the South Subunit of the Book Cliffs which had a higher buck/doe ratio than the North. The RAC and Wildlife Board accepted the committee's proposal to split the North and South subunits during the any weapon buck deer hunt.

Strategies to address Limiting Factors:

- < Crop Depredation - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.

- < Habitat Changes - The vast expanse of the Book Cliffs herd unit is public land managed under a “multiple use” directive. In recent years increased energy development activities have and will continue to contribute to substantial habitat losses and increasing habitat fragmentation. Development of mineral resources through traditional well pads and associated drilling and production facilities may negatively impact deer habitat quality and quantity through loss, disturbance and fragmentation. The paving of the Seep Ridge Road has increased habitat fragmentation and deer vehicle collisions. In addition to existing mineral lease activities, future development of tar sands and/or oil shale extraction activities pose a significant additional threat to deer habitat. The Book Cliffs deer herd is summer range limited and exhibits slower herd recovery following significant population declines. Proliferation of nonsystem roads and increasing ATV and OHV use compromises deer security and escape possibilities. Domestic cattle grazing outside of recognized grazing plan utilization levels and seasons may negatively impact deer forage availability and condition. Excessive habitat utilization will be addressed when observed. We will continue habitat improvement projects in critical habitat areas.
- < Predation - DWR will follow the strategies outlined in the predator management policy.
- < Highway Mortality - Cooperate with the Utah Department of Transportation and appropriate county road departments in construction of fences, crossing structures, and warning signs, especially in conjunction with the paving of the Seep Ridge Road.
- < Illegal Harvest - Support law enforcement efforts to educate the public concerning poaching and reduce illegal taking of deer. In cooperation with the Law Enforcement Section, develop specific preventative measures within the context of an Action Plan to prevent illegal harvest.
- < Disease Management - Investigate and manage diseases that threaten mule deer populations and continue monitoring for chronic wasting disease (CWD) as stated in the statewide mule deer plan. The DWR will continue surveillance through check stations and other methods to document prevalence, and location of positive animals in accordance with the statewide CWD plan.

HABITAT MANAGEMENT OBJECTIVES

- < Maintain and/or enhance forage production through direct range improvements to support and maintain herd population management objectives.
- < Work with private landowners and federal, state, local and tribal governments to maintain and protect critical and existing ranges from future losses and degradation.
- < Provide improved habitat security and escapement opportunities for deer.
- < Mitigate impacts from energy development activities.
- < Minimize deer vehicle collisions along the Seep Ridge Road corridor.

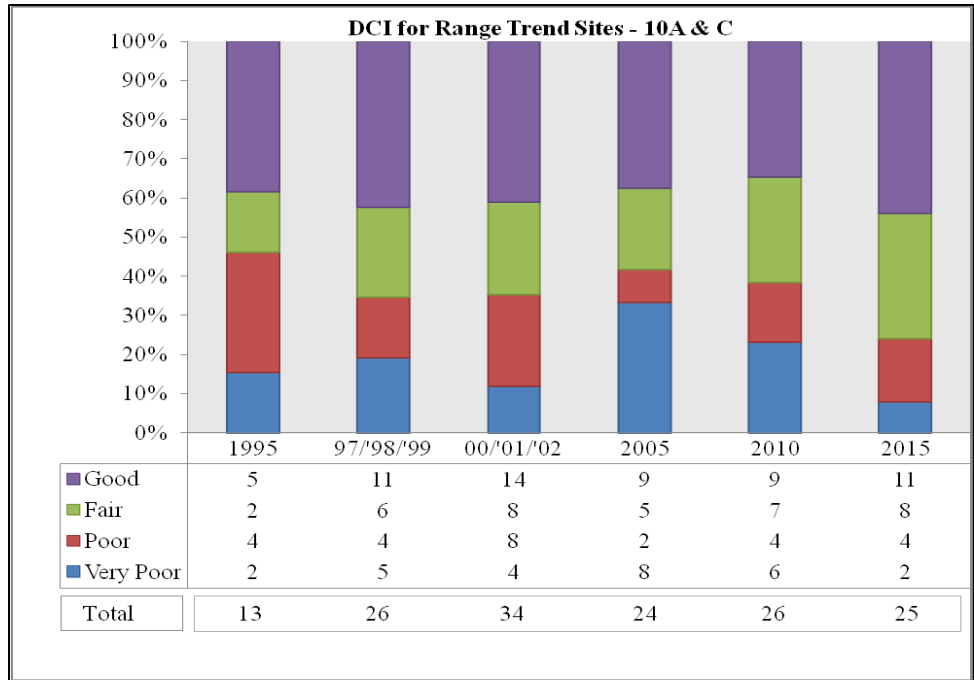
HABITAT MANAGEMENT STRATEGIES

- < In 2020 a Working Group was formed composed of varied parties and interests with a stake in responsible management of natural resources in the Book Cliffs. The action plan produced by this committee and their follow up recommendations will be taken into advisement by the DWR and supported and implemented to every reasonable extent.
- < Continue to monitor permanent range trend studies located throughout the unit.

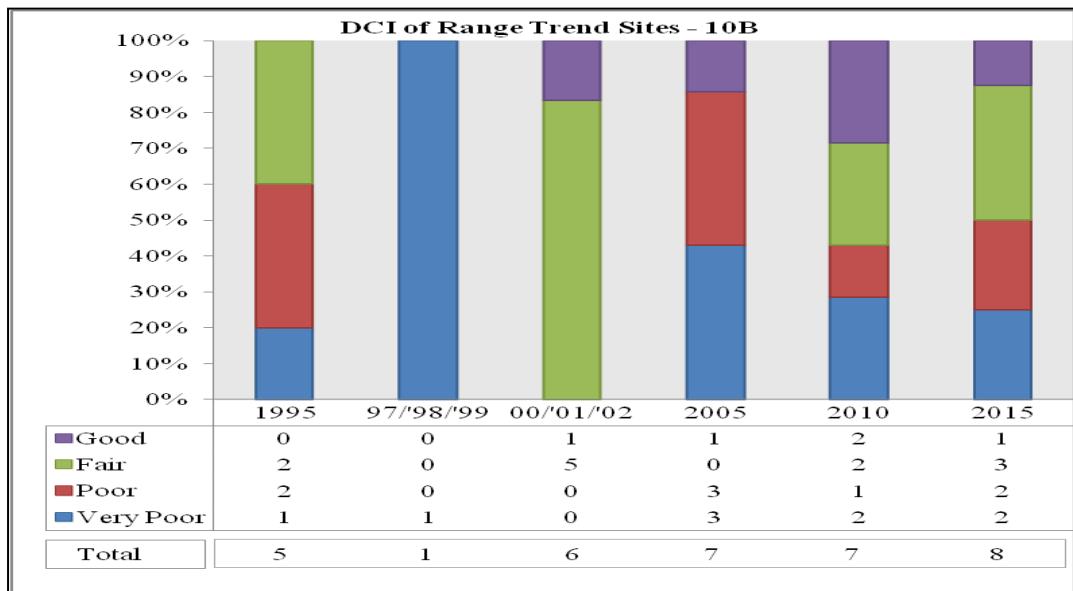
- < Conduct cooperative seasonal range rides and surveys to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys.
- < Work cooperatively to utilize grazing, prescribed burning and other recognized vegetative manipulation techniques to enhance deer forage quantity and quality.
- < Cooperate with and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.
- < Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities. Oil and Gas specific habitat biologists will lead this effort.
- < Continue to monitor deer survival in relation to the paving of the Seep Ridge Road and work to minimize deer vehicle collisions through fencing, crossing structures, signage, etc.
- < Cooperate with partners to maintain, improve and expand availability of water for deer on the unit using guzzlers, improved springs, and/or other water systems.
- < Work with partners to reduce or eliminate stray/abandoned horses and with the BLM to manage wild horses in accordance with the BLM Resource Management Plan.

PERMANENT RANGE TREND SUMMARIES

In 2015 mule deer habitat range trend Desirable Conditions Indices were calculated for 22 permanent range trend sites on the North Book Cliffs and 7 permanent range trend study sites on the South Book Cliffs. On the North Book Cliffs 5 "High Potential" summer range sites were evaluated, 8 "Mid Potential" spring/fall transition range sites were evaluated, and 9 "low potential" winter range sites were evaluated. On the South Book Cliffs 7 "low potential" winter range sites were evaluated. These range trend studies show a general trend of stability over the last 10 years with the exception of browse availability on the South Book Cliffs which has declined. In addition, the forb component has generally declined in all these study sites as it has across much of Utah. Weather patterns are the driving force behind much of the trend in range conditions, but continued efforts to reduce pinion juniper monocultures, diversify plant communities, develop/protect limited water resources, increase vigor of browse communities and promote sustainable livestock grazing practices are critical.



Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 10A & C, North Book Cliffs.



Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 10B, South Book Cliffs.

APPENDIX

Unit 10 Book Cliffs, South subunit

Grand County - Boundary begins at the Utah-Colorado state line and the summit and drainage divide of the Book Cliffs; west along this summit and drainage divide to Diamond Ridge; southwest along Diamond Ridge and the Book Cliffs summit (north-south drainage divide) to the Uintah and Ouray Indian Reservation boundary (Hells Hole/head of Segoe Canyon); west along this boundary to the Green River; south along the Green River to Swasey boat ramp and Hastings Road; south along Hastings Road to SR-19; south and east along SR-19 to exit 164 of I-70;; east along I-70 to the Utah-Colorado state line; north along this state line to the summit and drainage divide of the Book Cliffs.

Unit 10 Book Cliffs, North subunit

Grand and Uintah counties -- Boundary begins at the Utah-Colorado state line and the White River; south along this state line to the Book Cliffs summit (north-south drainage divide); west along this summit and drainage divide to Diamond Ridge; southwest along Diamond Ridge and the Book Cliffs summit (north-south drainage divide) to the Uintah and Ouray Indian Reservation boundary (Hells Hole/head of Segoe Canyon); west along this boundary to the Green River; north along the Green River to the White River; east along this river to the Utah-Colorado state line.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 11
Nine Mile
October, 2020

BOUNDARY DESCRIPTION

Carbon, Duchesne, Emery and Uintah counties—Boundary begins at US-40 and US-191 in Duchesne; southwest on US-191 to US-6; southeast on US-6 to I-70; east on I-70 to Exit 164 and SR-19 near the town of Green River; north and west on SR-19 to Hastings Road; north on this road to the Swasey boat ramp and the Green River; north along this river to the Duchesne River; west along this river to US-40 at Myton; west on US-40 to US-191 in Duchesne.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	7240	1%	35036	10%	57349	11%
Bureau of Land Management	315657	59%	111058	31%	296492	57%
Utah State Institutional Trust Lands	38845	7%	28819	8%	38596	8%
Native American Trust Lands	48508	9%	0	0%	48686	9%
Private	116726	22%	178895	51%	70679	14%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	4890	1%	0	0%	6906	1%
TOTAL	531866	100%	353808	100%	518708	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long term carrying capacity of the available habitat, based on winter range trend studies conducted by the DWR every five years.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size - Manage for a 5-year target population of 8,500 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. Biologists will continue to carefully monitor winter ranges and make recommendations to improve and protect winter habitat. Should over-utilization and range damage by deer occur, recommendations will be made to reduce deer populations to sustainable levels in localized areas. When available, annual Body Condition Scores (BCS) based on body fat measurements for deer on the unit or adjacent/representative units will be used to assess herd health. The need for antlerless harvest will be based on BCS and range condition.

Long Term Objective - Manage for a winter population of 8,500 deer, distributed across the Range Creek and Anthro subunits

Anthro subunit: 2,500
Range Creek subunit: 6,000

- < **Herd Composition** – Manage for a three year average postseason buck to doe ratio of 18 to 20 bucks/100 does in accordance to the statewide plan.
- < **Harvest** – Manage harvest by having General Season unit by unit buck deer hunt regulations, using archery, rifle, and muzzleloader hunts. Buck permits will be adjusted to maintain buck/doe ratio objectives. A late season limited entry muzzleloader hunt will be offered to provide additional opportunity for hunters. Antlerless permits will be issued to address specific localized crop depredation or range degradation.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- **Population Size** - A population estimate will be made based on fall and spring herd composition counts conducted by biologists, harvest surveys, and mortality estimates based on radio collar studies. These data will be used in a population model to determine a winter deer herd population size. The modeled population estimate for the winter of 2015 was 6800 deer with approximately 3/4 of the deer residing on the Range Creek Subunit (5,100 deer) and 1/4 of the deer on the Anthro Subunit (1,700 deer).
- **Harvest** - The primary means of monitoring harvest will be through the statewide uniform harvest survey. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck:doe ratios

Strategies to address Limiting Factors:

- Crop Depredation - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
-
- Habitat - Summer Range is limiting on this unit. Limited portions of the winter range are in poor condition as a result of drought and/or overutilization by wildlife, feral horses, and domestic livestock. Utilization of key shrub species on critical winter ranges will be monitored. This unit has large tracts of private land.
- Predation – We will follow DWR predator management policy.
- Highway Mortality - Work with UDOT, Counties, universities, local conservation groups, and landowners to minimize highway mortality by identifying locations of high deer-vehicle collisions and erecting sufficient wildlife crossing structures in those locations. Evaluate the effectiveness of the crossing structures over time and implement new technologies to improve future wildlife crossing structures.
- Illegal Harvest – Should illegal kill become an identified and significant source of mortality, attempt to develop specific preventive measures within the context of an Action Plan developed in cooperation with the Law Enforcement Section.
- Disease Management - Investigate and manage diseases that threaten mule deer populations and continue monitoring for chronic wasting disease (CWD) as stated in the statewide mule deer plan. The DWR will continue surveillance through check stations and other methods to document prevalence, and location of positive animals. Targeted hunts in localized areas may be developed to accomplish additional CWD sampling, to reduce localized deer densities and/or buck-to-doe ratios in an effort to address disease hotspots in accordance with the statewide CWD plan.

HABITAT MANAGEMENT OBJECTIVES

- < Protect, maintain, and/or improve deer habitat through direct range improvements to support and maintain herd population management objectives.
- < Work with private landowners and federal, state, and local governments to maintain and protect critical and existing ranges from future losses and degradation through grazing management and OHV and Travel Plan modifications.
- < Work with federal, private, and state partners to improve crucial deer habitats through the Watershed Restoration Initiative (WRI) process.
- < Work with federal and state partners in fire rehabilitation on crucial deer habitat through the WRI process
- < Maintain and protect critical winter range from future losses. Acquire critical winter range when the opportunity arises.
- < Minimize and mitigate impacts from energy development activities.
- < Minimize deer vehicle collisions along highways on the unit.

HABITAT MANAGEMENT STRATEGIES

- < Continue to improve, protect, and restore sagebrush steppe habitats critical to deer. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, grazing management, water developments etc. on public and private lands. Habitat improvement projects will occur on both winter ranges and summer range.
- < Continue to monitor permanent range trend studies located throughout the unit.
- < Conduct cooperative seasonal range assessments to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.
- < Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of Conservation Easements etc. on private lands.
- < Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.
- < Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities. Oil and Gas specific habitat biologists will lead this effort.
- < Manage vehicle access on DWR lands to limit human disturbance during times of high stress, such as winter and fawning.
- < Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid to late summer.
- < Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheat grass with desirable perennial vegetation.
- < Reduce expansion of Pinion-Juniper and other woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- < Manage conifer encroachment on important summer ranges by utilizing prescribed fire.
- < Cooperate with partners to maintain, improve and expand availability of water for deer on the unit using guzzlers, improved springs, and/or other water systems.
- < Cooperate with federal agencies in managing wild horse numbers within approved objectives to minimize competition and resource degradation of habitats important to deer.
- < Utilize antlerless deer harvest to improve or protect forage conditions when vegetative declines are attributed to deer over utilization.

PERMANENT RANGE TREND SUMMARIES

Unit 11a, Nine Mile, Anthro Subunit

Deer Winter Range Condition Assessment

The condition of deer winter range Nine Mile, Anthro management subunit has continually changed on the sites sampled since 1995. All of the Range Trend study sites (Cottonwood Canyon and Nutter's Canyon) are considered to be in good condition as of the 2015 sample year (Figure 1). The single treated study site, Big Wash, was sampled before treatment and is in very poor condition. It is possible given a treatment, more time, and continual monitoring that this site will improve.

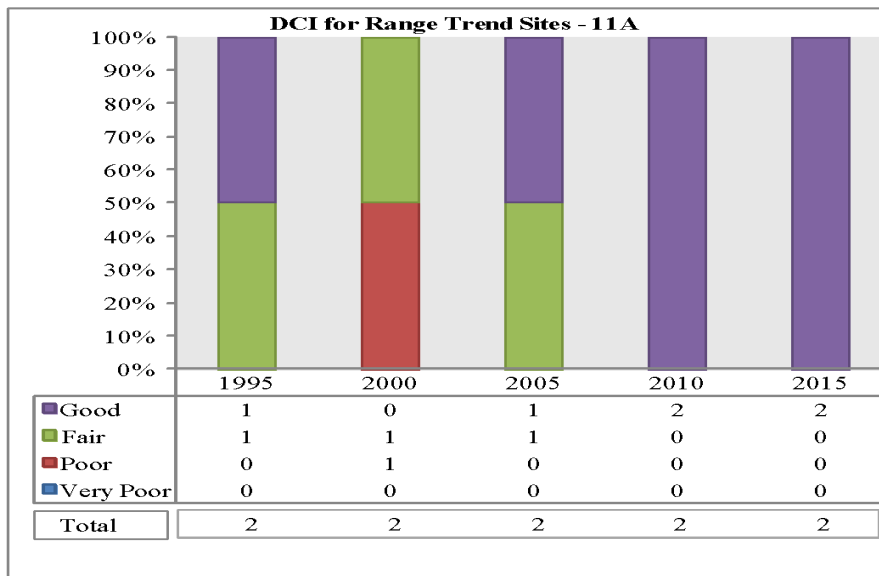


Figure 1. Deer winter range Desirable Components Index (DCI) summary by year of undisturbed sites for WMU 11A, Nine Mile, Anthro.

Unit 11b, Nine Mile, Range Creek Subunit

There are 12 permanent winter range trend sites on the Range Creek Subunit of the Nine Mile Unit that were read in 2015. The overall trend in relative winter range health as noted by the DCI has been slightly improving over the past two decades. Browse cover and density has improved on 11 of the 12 sites measured, whereas the herbaceous component is improving on only 7 of the 12 sites (See Figures 2 and 3). Most range trend sites across the unit show light deer use with a few sites near the town of Price showing extremely high use.

High quality summer range is limiting on the subunit. A relatively small percentage of the unit occurs at high enough elevations to provide good summer range for deer.

Figure 2. Trends in Shrub Cover on 4 Ecological Types Representing the Majority of Mule Deer Winter Ranges

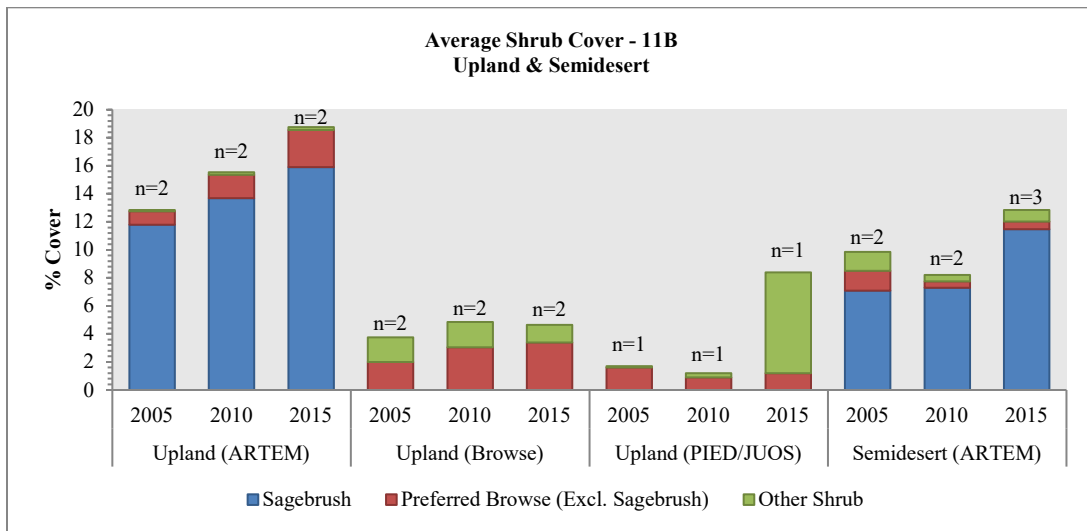
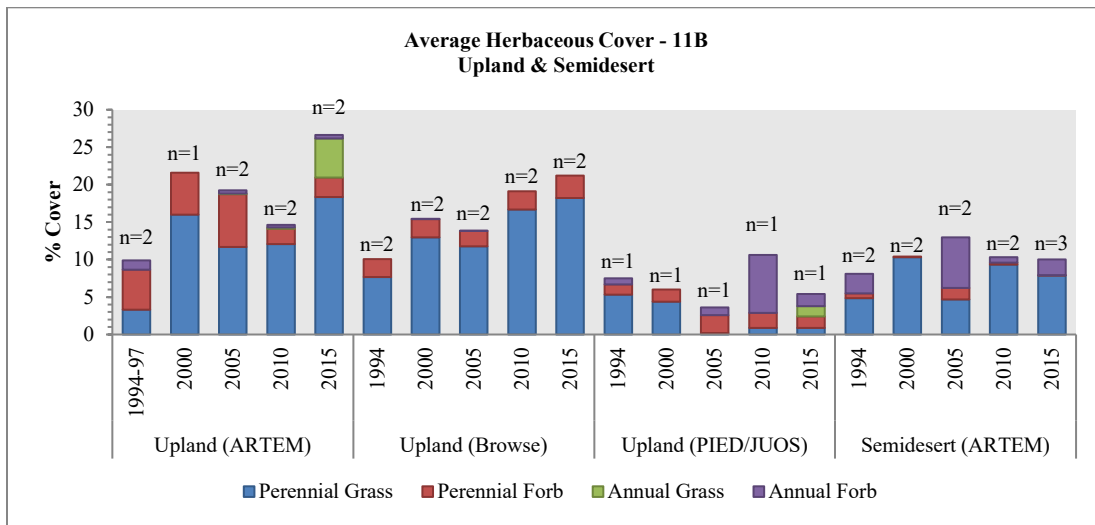


Figure 3. Trends in Herbaceous Cover on 4 Ecological Types Representing the Majority of Mule Deer Winter Range.

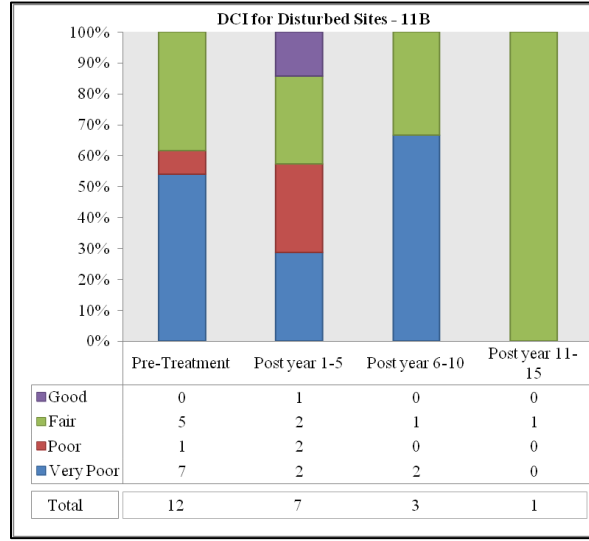
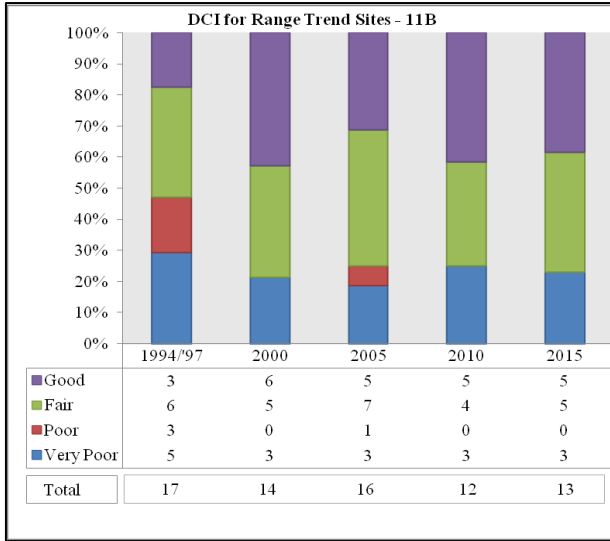


Deer Winter Range Condition Assessment

The condition of deer winter range within the Nine Mile, Range Creek management unit has continually changed on the sites sampled since 1994. Airport, Coal Creek, Cedar Ridge, Twin Hollow, and Steer Ridge remained in good condition. Airport Bench, Cottonwood, Cedar Corral, Dugout Creek PJ Chained, and Deadman Creek are in fair condition. Finally, the Deadman, 'B' Canyon, and Prickly Pear studies are considered to be in very poor condition generally due to the lack of browse cover and sagebrush diversity (Figure 4a). The treated study sites range from very poor to good. The treated sites have generally improved as time since treatment increases; the exceptions to this are the East Carbon Bullhog and Horse Canyon studies, which went from poor to very poor, and Deadman, which remained in very poor condition. Cold Springs WMA, Dugout, Cottonwood, and Cottonwood Ridge were all sampled prior to treatment and were in very poor or fair condition. West Coal Creek Bullhog improved from very poor to

fair, Airport Bench and Dugout Creek PJ Chained remained in fair condition. It is possible given more time and continual monitoring that these sites will continue to improve.

Figures 4a and 4b. DCI Scores for Permanent Range Trend and Disturbed Sties, 1994 - 2015.



DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 17
Wasatch Mountains
October 2020

BOUNDARY DESCRIPTION

Carbon, Duchesne, Salt Lake, Summit, Utah and Wasatch counties—Boundary begins at the junction of I-15 and I-80 in Salt Lake City; east on I-80 to US-40; south on US-40 to SR-32; east on SR-32 to SR-35; southeast on SR-35 to SR-87; south on SR-87 to Duchesne and US-191; south on US-191 to US-6; northwest on US-6 to I-15; north on I-15 to I-80 in Salt Lake City. EXCLUDING ALL NATIVE AMERICAN TRUST LAND WITHIN THIS BOUNDARY.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	YEARLONG RANGE		SUMMER RANGE		WINTER RANGE		TOTAL ACRES
	Area (acres)	%	Area (acres)	%	Area (acres)	%	
Forest Service	17,268	32%	687,185	62%	104,466	22%	808,919
Bureau of Land Management	0	0%	12,105	1%	8,768	2%	20,873
Utah State Institutional Trust Lands	0	0%	34,450	3%	3,939	1%	38,389
Native American Trust Lands	4,732	9%	20,930	2%	51,061	11%	76,723
Private	28,660	52%	297,425	27%	240,366	50%	566,451
Department of Defense	0	0%	0	0%	0	0%	0
USFWS Refuge	0	0%	0	0%	0	0%	0
National Parks	235	1%	0	0%	0	0%	235
Utah State Parks	401	1%	9,153	1%	13,462	3%	23,016
Utah Division of Wildlife Resources	3,433	6%	47,363	4%	58,330	12%	109,126
TOTAL	54,729	100%	1,108,611	100%	480,392	100%	1,643,732

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- Target Winter Herd Size - Achieve a long-term combined target population size of 43,600 wintering deer (modeled number).

Unit 17

17a Wasatch West subpopulation:	22,600
17b Currant Creek subpopulation:	17,000
17c Avintaquin subpopulation:	4,000
Total:	43,600

- 5 year Winter Herd Size – Manage for a target population of 43,600 wintering deer during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. Biologists will continue to carefully monitor winter ranges and make recommendations to improve and protect winter habitat. Should over-utilization and range damage by deer occur, recommendations will be made to reduce deer populations to sustainable levels in localized areas. When available, annual Body Condition Scores (BCS) based on body fat measurements for deer on the unit or adjacent/representative units will be used to assess herd health. The need for antlerless harvest will be based on BCS and range condition.
- Herd Composition – All Wasatch Mountains subunits are General Season subunits and will be managed to maintain a three year average postseason buck to doe ratio according to the statewide plan (17a is managed for 15-17 bucks per 100 does. 17b,c is managed for 18-20 bucks per 100 does).

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and spring classifications, and gps collar survival estimates, a model has been developed to estimate winter population size.
- Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey. We recognize that buck harvest may be above or below what is expected due to climatic and productivity variables, and we will make hunt recommendations to make progress towards approved buck:doe ratio objectives. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck: doe ratios.

Limiting Factors

- Crop Depredation – DWR will take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- Habitat - Public land winter range availability, landowner acceptance and winter range forage conditions will determine herd size. Excessive habitat utilization will be addressed with hunting.
- Predation - DWR will follow the strategies outlined in the predator management policy
- Highway Mortality - Cooperate with the Utah Dept. Of Transportation in construction of highway fences, passage structures, warning signs, etc.
- Illegal Harvest - If illegal harvest is identified as a significant source of mortality, an attempt

to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement section.

- Disease Management - Investigate and manage diseases that threaten mule deer populations and continue monitoring for chronic wasting disease (CWD) as stated in the statewide mule deer plan. The DWR will continue surveillance through check stations and other methods to document prevalence, and location of positive animals in accordance with the statewide CWD plan

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Seek cooperative projects to improve the quality and quantity of deer habitat.
- Provide improved habitat security and escapement opportunities for deer.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and other vegetation data.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements on private lands.

Habitat Improvement

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bull hog and chaining.
- Cooperate with partners to maintain, improve and expand availability of water for deer in arid/limiting area on the unit using guzzlers, improved springs, and/or other water systems.
- Cooperate with federal land management agencies and local governments in developing and

administering access management plans for the purposes of habitat protection and escape or security areas.

- Future habitat work should be concentrated on the following areas.
 - 17a
 - North side of hwy 6 in the Sheep Creek drainage
 - Wallsburg WMA
 - North side of Diamond Fork Canyon
 - Quaking aspen forests unit wide
 - Anywhere along the front that would avert deer from entering cities
 - 17b
 - West Fork of the Duchesne
 - Currant Creek WMA
 - Tabby Mountain WMA
 - Wildcat WMA
 - 17c
 - Dollar Ridge Fire
 - Strawberry River WMA
 - Horse Ridge WMA
 - Reservation Ridge
 - Strawberry Peak area (Slab Canyon, Cow and Calf Hollow, etc.)

PERMANENT RANGE TREND SUMMARIES

Unit 17bc, Wasatch Mountains, Currant Creek, and Avintaquin Subunits 2015

The following tables summarize the condition of deer winter range on Unit 17bc, as indicated by DWR permanent Big Game Range Trend studies:

The condition of deer winter range within the Wasatch Mountains management unit has fluctuated on the sites sampled since 1994. The Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2015 sampling year (Figure 1). Sand Wash went from poor to very poor due to a decrease in browse and perennial forb cover. Grey Wolf Mountain and Lower Santaquin Draw are in poor condition, Rabbit Gulch is in fair condition, Two Bar Ranch went from good to fair, and Santaquins Cabin, Cutoff, Lower Horse Ridge, Emma Park, Little Horse Ridge, Road Hollow, and Emma Park Harrow Grazed sites are all in good to excellent condition. The treated study sites range from very poor to good (Figure 2). In general the treated sites have improved as time since treatment increases. Santaquins Cabin, Lower Horse Ridge, Rabbit Gulch, and Road Hollow are also considered to be Range Trend sites and are discussed above. Tabby Mountain was sampled prior to treatment and is considered to be in very poor condition. Rabbit Gulch Chaining and Golden Stairs Chaining remained in very poor condition, Blacktail Chaining went from poor to very poor, Grey Wolf Chaining went from fair to poor, Two Bar-Blacktail Chaining went from good to poor, and Two Bar-Sand Wash Chaining went from very poor to fair. In addition, East Santaquin Chaining remained in poor condition, Santaquin Chaining improved from poor to good, Santaquin Greasewood and Rabbit Gulch Interseed went from good to fair, and Skitzzy Chaining improved from good to excellent condition. It is possible given more time and continual monitoring that these sites will continue to improve.

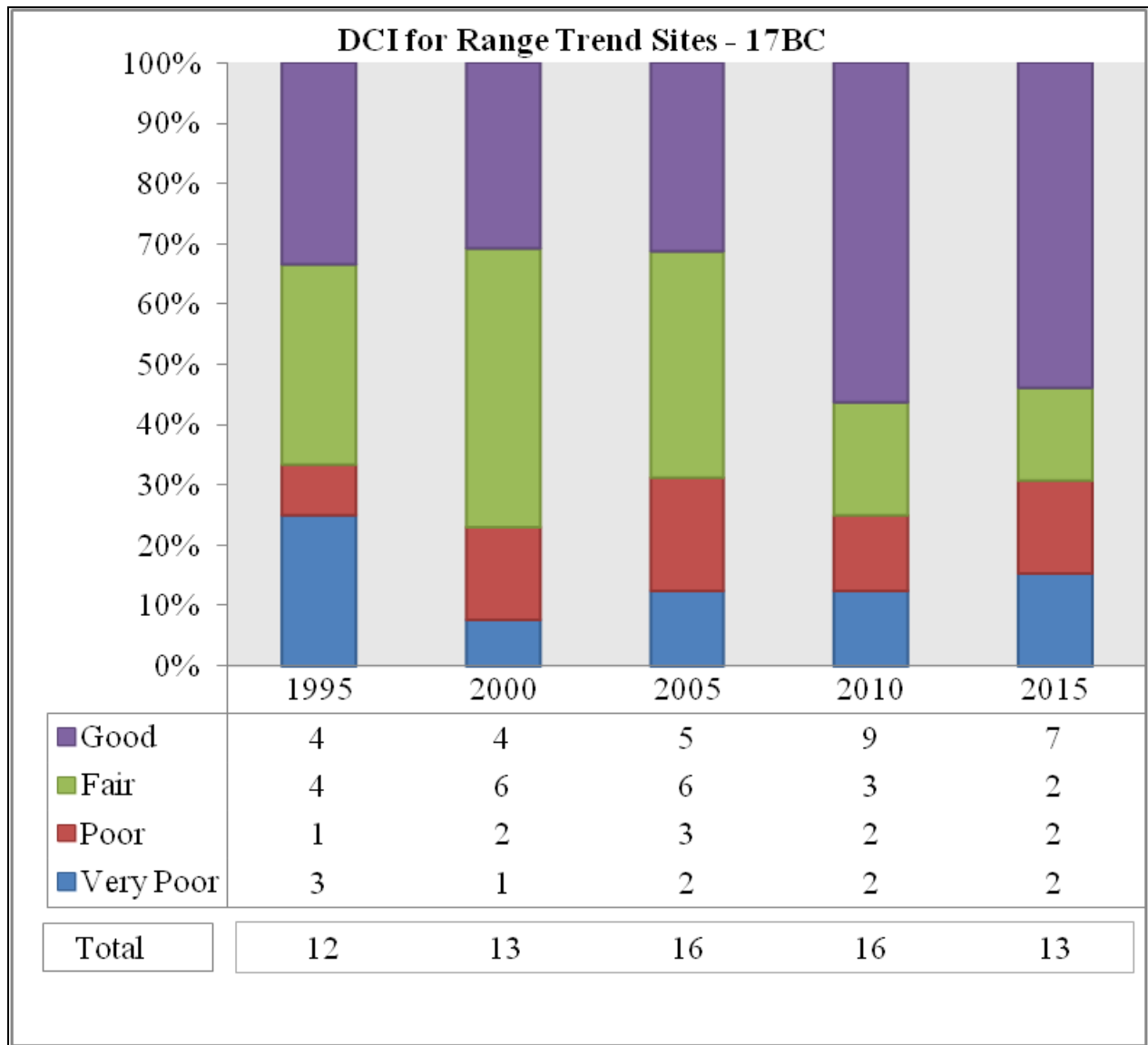


Figure 1. Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 17BC, Wasatch Mountains, Currant Creek-Avintaquin.

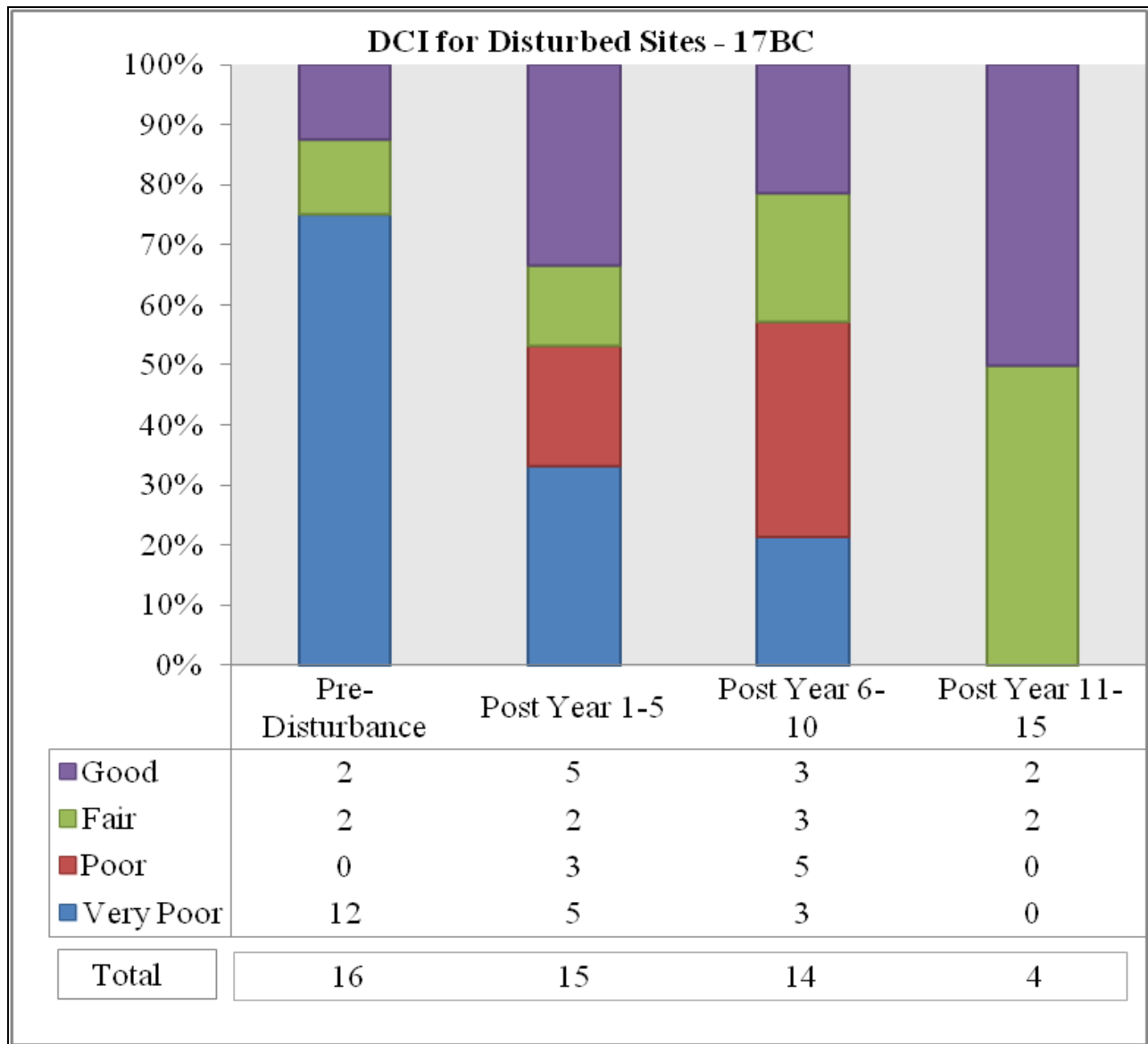


Figure 2. Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 17BC, Wasatch Mountains, Currant Creek-Avintaquin.

Winter range is the critical habitat factor on these subunits. Approximately half of the 200,000 plus acres of winter range is owned and managed by the State while the other half is in private ownership. Most of the privately owned winter range is currently under threat of cabin site & ranchette development.

All 13 range trend study sites on these subunits are located in mule deer winter range. Vegetation varies from Pinyon-Juniper at lower elevations to sagebrush-grass and mountain brush communities at the higher elevations.

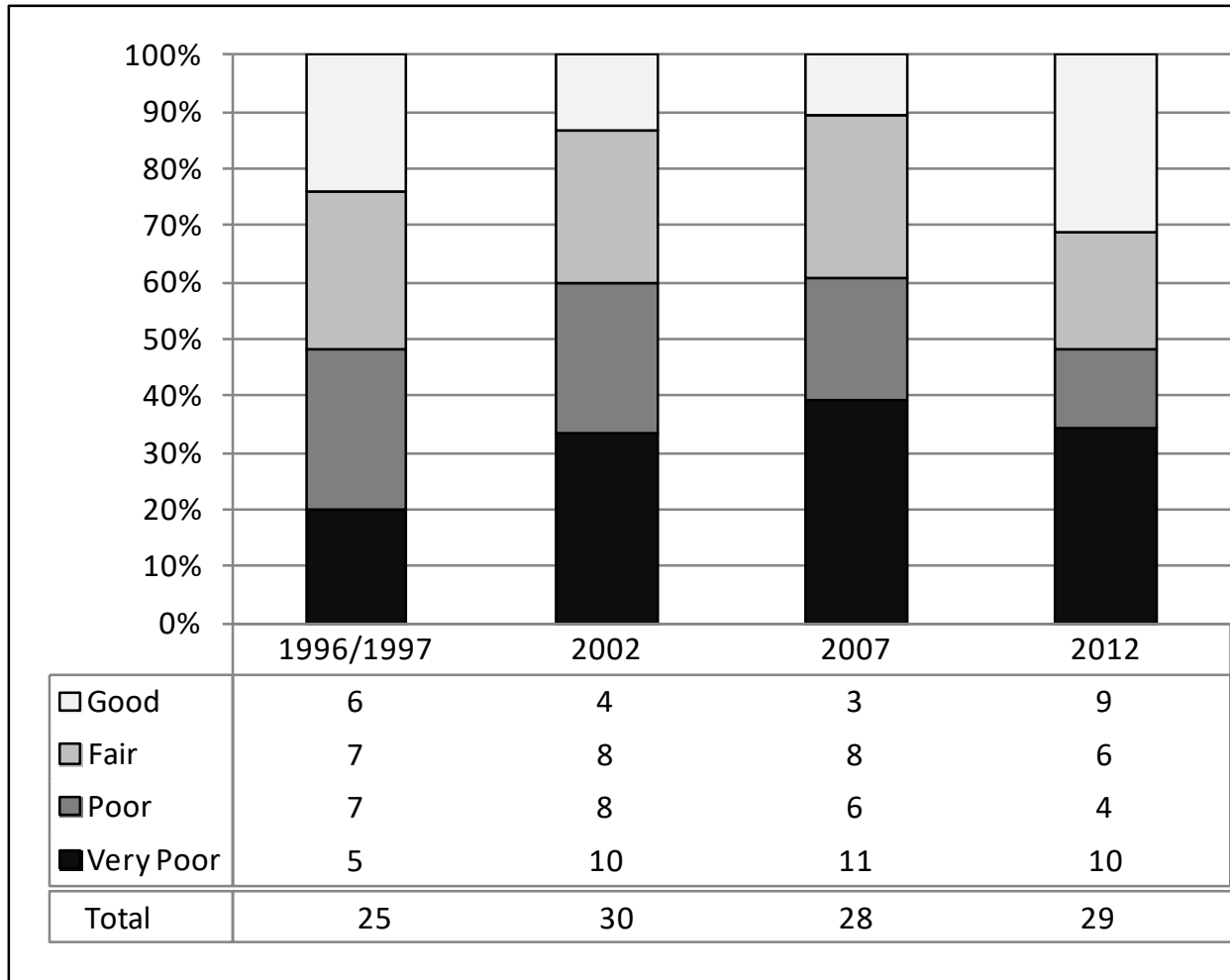


Figure 3. Deer winter range condition trend summary for subunit 17a, Wasatch Mountains, West, as indicated by the deer winter range Desirable Components Index (DCI).

There were 29 permanent range trend study sites sampled on subunit 17a in 2012, all of which are considered to be in deer winter range (see Figure 3). For summary purposes the subunit was divided into three distinct areas; Heber Valley, Bonneville Shoreline, and Spanish Fork Canyon.

Heber Valley: Much of the winter range in the Heber Valley area (50%) is privately owned and development has been a continuing concern. Since the early 2000's development has accelerated and some of the most critical range is being converted to housing. Division of Wildlife Resources, State Parks, and federal lands will likely be the key to the survival of deer into the future on this portion of the unit. Important vegetation types monitored include antelope bitterbrush, mixed mountain browse, mixed oakbrush/sagebrush, and mountain big sagebrush.

There were 11 range trend study sites sampled around the Heber Valley area in 2012. Sites in the area showed a general decrease in sagebrush density, cover, and health in 2007. It is thought that an infestation of the sagebrush defoliator moth (*Aroga websteri*) likely occurred throughout the Heber Valley from 2002 to 2007 affecting many of the studies adversely. The moth was sampled on many of the studies in that area in 2007. The health of these sagebrush populations appears to be improving, but density and cover of sagebrush remained at reduced levels. The abundance of the weedy annual grass species (namely cheatgrass) and bulbous bluegrass is a particular concern on these sites and may inhibit the recovery of sagebrush in the areas.

Bonneville Shoreline: Winter habitat is limited by quality and quantity in this area of the subunit. A large portion of deer winter range is privately owned making it susceptible to development. Housing

developments in recent years have consumed much of this important winter range and will likely continue to do so in the future. Most winter range has been reduced to a narrow bench above the communities of Alpine, Pleasant Grove, Orem, Springville and Mapleton. Important vegetation types monitored include antelope bitterbrush, true mountain mahogany, mixed mountain browse, mixed oakbrush/sagebrush, and Stansbury cliffrose.

There were nine studies sampled along the Bonneville Shoreline area in 2012. The lack of browse species is a primary concern in this area, and is likely an artifact of historic wildfires on many of these studies. The abundance of weedy annual grass species (namely cheatgrass) and bulbous bluegrass is a particular concern on these sites.

Spanish Fork Canyon: The majority of deer winter range is managed by the US Forest Service in this area. These sites are typically higher elevation winter range and may not be used as heavily in more severe winters. Important vegetation types monitored include mixed mountain browse, mixed oakbrush/sagebrush, and sagebrush.

There were nine studies sampled in the Spanish Fork Canyon area in 2012. Browse species do not appear to be limited within this area. The primary concern in this area is the abundance of the weedy grass species bulbous bluegrass. A desirable trend is the increase in perennial grass species on many of the studies in this area.

General Assessment: The winter range within the Heber Valley and Spanish Fork Canyon areas of the subunit appear suitable to support planned deer population objectives. Suitable winter range on the Bonneville Shoreline is more limited due primarily to development and poor quality habitat. Deer will likely be forced to winter in an urban setting during more severe winters in this area. The abundance and increase of bulbous bluegrass is a concern in all of the areas of the subunit because this perennial species can form dense mats of cover that may compete with other more desirable herbaceous species and with seedlings and young shrubs, which potentially limits establishment of new plants into the population. The abundance of cheatgrass in the Heber Valley and Bonneville Shoreline areas of the unit is a concern because this annual species can increase fuel loads and increases the chance of a catastrophic fire event.

Unit 17, Wasatch Mountains/Salt Lake County, East Bench Subunit

Range trend studies have not been done on this subunit since 1983. Lack of access to trend study plots that have not been destroyed by development has resulted in these studies being abandoned. Very little winter range is available on this subunit and deer are forced to winter in an urban setting during more severe winters.

Precipitation

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Precipitation and Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the Northern Mountains division (Division 5). The Northern Mountains division had a historic annual mean precipitation of 19.13 inches from 1895 to 2012. The mean annual PDSI of the Northern Mountains division displays a cycle of several wet years followed by several drought years over the course of study years (Figure 4 and Figure 5) (Time Series Data 2013).

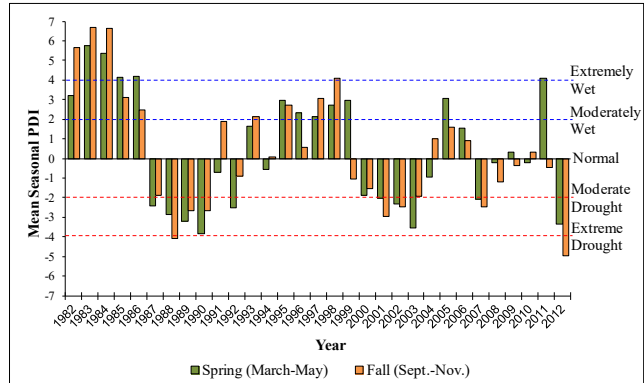
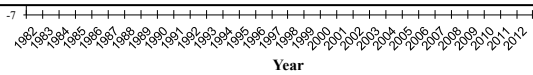


Figure 4. The 31 year mean annual Palmer Drought Severity Index (PDSI) for the Northern Mountains division (Division 5). The PDSI is based on climate data gathered from 1895 to 2012. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought (Time Series Data 2013).

Figure 5. The 31 year mean spring (March-May) and fall (Sept.-Nov.) Palmer Drought Severity Index (PDSI) for the Northern Mountains division (Division 5). The PDSI is based on climate data gathered from 1895 to 2012. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought (Time Series Data 2013).



APPENDIX – subunit hunt boundaries

Unit 17-Wasatch Mountains, Wasatch West subunit

Salt Lake, Summit, Utah and Wasatch counties -- Boundary begins at I-80 and I-15 in Salt Lake City; east on I-80 to US-40; south on US-40 to the Strawberry Bay Marina road; south on this road to USFS Road 042 (Indian Creek road); south and west on this road to USFS Road 051; south on this road to US-6; west on US-6 to US-89; northwest on US-6 to I-15; north on I-15 to I-80 in Salt Lake City.

Unit 17-Wasatch Mountains, Wasatch East subunit

Carbon, Duchesne, Utah and Wasatch counties -- Boundary begins SR-87 and US-40 in Duchesne; north on SR-87 to SR-35; west on SR-35 to SR-32 at Francis; west on SR-32 to US-40; southeast on US-40 to Strawberry Bay Marina Road; south on this road to USFS Road 042 (Indian Creek); south and west on this road to USFS Road 051; south on this road to US-6; southeast on US-6 to US-191; north on US-191 to US-40; east on US-40 to SR-87 in Duchesne. EXCLUDES ALL NATIVE AMERICAN TRUST LANDS WITHIN THIS BOUNDARY.

Unit 17- Wasatch Front Extended Archery

Davis, Salt Lake, and Summit counties -- Boundary begins at I-15 and the Weber/Davis county line; east on this county line to the Davis/Morgan county line; south on this county line to the Morgan/Salt Lake county line; south on this county line to the Salt Lake/Summit county line; south on this county line to I-80; east on I-80 to US-40; south on US-40 to Summit/Wasatch county line; west on this county line to the Wasatch/Salt Lake county line; west on this county line to the Salt Lake/Utah county line; west on this county line Upper Corner Canyon Road; north on this road to Highland Drive; north on this road to Pioneer Road; west on this road to 700 East; north on this road to 12300 South; west on this road to I-15; north on I-15 to the Salt Lake/Davis county line; west on this county line to the 4200ft elevation line; north along this elevation to Weber/Davis county line; east on this county line to I-15. EXCLUDES ALL WATERFOWL MANAGEMENT AREAS.

DEER HERD UNIT MANAGEMENT PLAN

Deer Herd Unit # 16, Central Mtns and Deer Herd Unit #12, San Rafael August, 2018

CENTRAL MOUNTAINS BOUNDARY DESCRIPTION

Utah, Carbon, Emery, Juab, Sevier and Sanpete counties - Boundary begins at the junction of US-6 and I-15 in Spanish Fork; southeast on US-6 to SR-10 in Price; south on SR-10 to I-70; west on I-70 to US-50 at Salina; north on US-50 to I-15 at Scipio; north on I-15 to US-6 in Spanish Fork.

This boundary includes three subunits including;

Central Mountains, Manti Subunit - Carbon, Emery, Sanpete, Sevier and Utah counties—Boundary begins at the junction of US-6 and US-89 in Spanish Fork Canyon; southeast on US-6 to Price and SR-10; south on SR-10 to I-70; west on I-70 to US-89; north on US-89 to US-6 in Spanish Fork Canyon. USGS 1:100,000 Maps: Nephi, Price, Huntington, Manti, Salina.

Central Mountains, Nebo Subunit - Juab, Millard, Sanpete, Sevier and Utah counties—Boundary begins at US-6 and I-15 at Spanish Fork; southeast on US-6 to US-89 near Thistle; south on US-89 to US-50 at Salina; northwest on US-50 to I-15 at Scipio; north on I-15 to US-6 at Spanish Fork. Excludes all CWMUs. USGS 1:100,000 Maps: Maps: Delta, Manti, Nephi, Provo, Salina.

San Rafael Unit - Carbon, Emery, Sanpete, Sevier and Utah counties—Boundary begins US-6 and US-10 in Price; southeast on US-6 to Interstate 70; east on I-70 to the Green River; south along this river to the Colorado River; south along this river (and the west shore of Lake Powell) to SR-95; north on SR-95 to SR-24 (hunters may harvest deer within 2 miles south of SR-24 between SR-95 and the Notom Road); west on SR-24 to Caineville and the Caineville Wash road; north on this road to the Cathedral Valley road; northwest on the Cathedral Valley road to the Capital Reef National Park boundary; north and west on the CRNP boundary back to the Cathedral Valley road; west on this road to Rock Springs Bench and the Last Chance Desert road; north on this road to the Blue Flats road; north and east on this road to the Willow Springs road; north on this road to the Windy Peak road; north and west on this road to I-70; east on I-70 to US-10; north on US-10 to US-6 in Price. Excludes all CWMUs. USGS 1:100,000 Maps: Hanksville, Hite Crossing, Huntington, La Sal, Loa, Manti, Nephi, Price, Salina, San Rafael Desert.

LAND OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	721980	73.8%	300717	28.3%
Bureau of Land Management	24	2.2%	28187	2.9%	224215	21.1%
Utah State Institutional Trust Lands	1039	93.4%	14980	1.5%	110636	10.4%
Private	50	4.5%	198911	20.3%	353779	33.3%
Department of Defense	0	0%	0	0%	200	0%
Utah State Parks	0	0%	23	0%	116	0%
Utah Division of Wildlife Resources	0	0%	14774	1.5%	72704	6.8%
TOTAL	1113	100%	978855	100%	1062367	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long term carrying capacity of the available habitat, based on winter range trend studies conducted by the DWR every five years.

POPULATION MANAGEMENT OBJECTIVES

- Target Winter Herd Size - Manage for a 5-year target population of *42,000 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. Biologists will continue to carefully monitor winter ranges and make recommendations to improve and protect winter habitat. Should over-utilization and range damage by deer occur, recommendations will be made to reduce deer populations to sustainable levels in localized areas.

* Changed from 60,600 to 42,000 (recommended) in 2020

Long Term Objective: (numbers below reflect numbers recommended in 2020, amended from original 2018 plan)

Central Mountains, Manti Subunit - 28,000 deer (amended from 38,000 to 28,000 in 2020)

Central Mountains, Nebo Subunit - 14,000 deer (amended from 22,600 to 14,000 in 2020)

Total Central Mountains Objective - 42,000 deer (amended from 60,600 to 42,000 in 2020)

- Herd Composition - A three year average postseason buck to doe ratio of 15 to 17 bucks/100 does in accordance with the statewide plan.
- Harvest - General Season unit by unit buck deer hunt regulations, using archery, any legal weapon, and muzzleloader hunts. Buck permits will be adjusted to maintain buck/doe ratio objectives. Caution and moderation will be used when adjusting buck permit numbers. Antlerless permits may be issued to address specific localized crop depredation or range degradation concerns.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - A population estimate will be made based on herd composition counts conducted by biologists, harvest surveys, and mortality estimates based on radio collar studies and range rides. These data will be used in a computer model to determine a winter deer herd population estimate.
- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey and the use of checking stations (Table 1a-c).
- Research - Continue to deploy GPS collars to monitor spatial use, survival, reproduction, and cause-specific mortality. Other research such as the statewide effort to collect body condition scores and disease profiles may continue as needed. The Manti subunit will likely be used as a surrogate for the entire central mountains area. Research projects addressing predator-prey dynamics as it pertains to mule deer should also be pursued.

Table 1a. Population Trends and Harvest for the Central Mountains, Manti Deer Subunit.

Year	Buck harvest	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2015	2,215	64	23	25,700	38,000	68%
2016	2,459	64	16	23,300	38,000	61%
2017	2,141	63	13	23,500	38,000	62%
3 Year Avg	2,272	64	17			

Table 1b. Population Trends and Harvest for the Central Mountains, Nebo Deer Subunit.

Year	Buck harvest	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2015	1,238	52	16	14,900	22,600	66%
2016	1,485	66	15	12,900	22,600	57%
2017	1,209	64	17	13,700	22,600	61%
3 Year Avg	1,311	61	16			

Table 1c. Harvest Trends for the San Rafael portion of the Manti subunit.

	2012	2013	2014	2015	2016	2017
Hunters Afield	1649	1264	1463	1531	1492	1558
Harvest	497	338	305	421	341	396

Population Augmentation

- Transplant deer to portions of the Manti subunit with low deer densities, particularly but not restricted to the southeast portions of the subunit. Consider transplant sources from areas with high deer densities and range over-utilization on this and other units as well as areas of urban nuisance populations.

Possible Transplant Locations (north to south; Figure 1)

Emery County: East Mtn, Stump Flat, Danish Bench, Cedar Bench, Horn Mtn/Biddlecome Ridge, Black Dragon, Dry Mtn, Sage Flat, Muddy Creek Cyn, Link Cyn

Sanpete County: McEwen Flat, The Pines/Greens Hollow/Wildcat Knolls

Sevier County: The Pines/Greens Hollow/Wildcat Knolls, Link Cyn, Quichupah Cyn/Water Hollow/Saleratus Benches, Trough and Mill Hollow/Gilson Valley

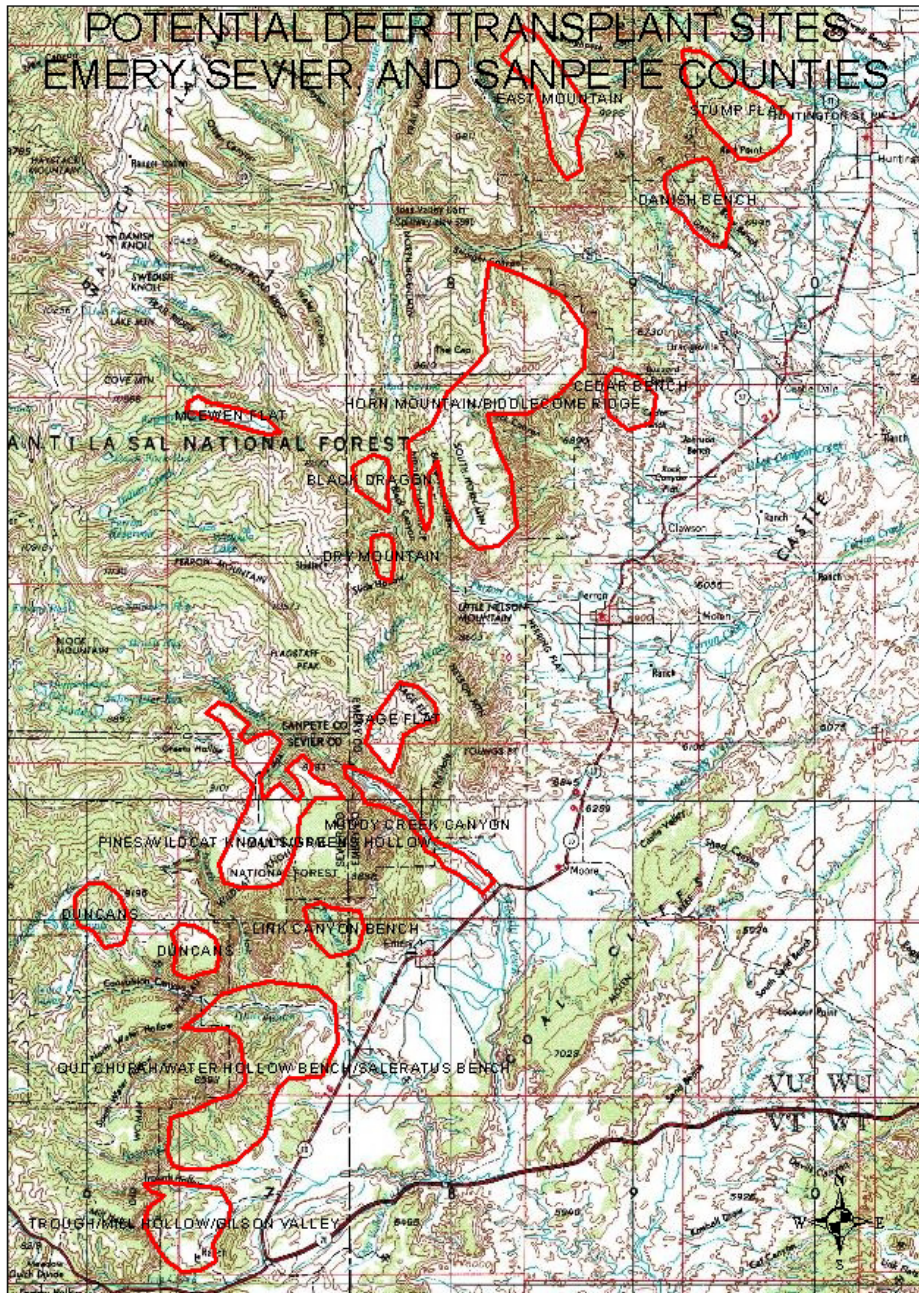


Figure 1. Map of Potential Deer Transplant Sites on the Southeast Manti.

- Transplant deer to portions of the Nebo subunit with low deer densities, particularly but not restricted to the southern portion of the San Pitch Mtns. Consider transplant sources from areas with high deer densities and range over-utilization on this and other units as well as areas of urban nuisance populations.

Possible Transplant Locations (counter-clockwise; Figure 2)

- Deep Creek WMA*
- Chriss Creek*
- Flat Canyon*
- Mellor Canyon*
- Maple Canyon WMA*
- Maple Canyon*
- Wales Canyon*

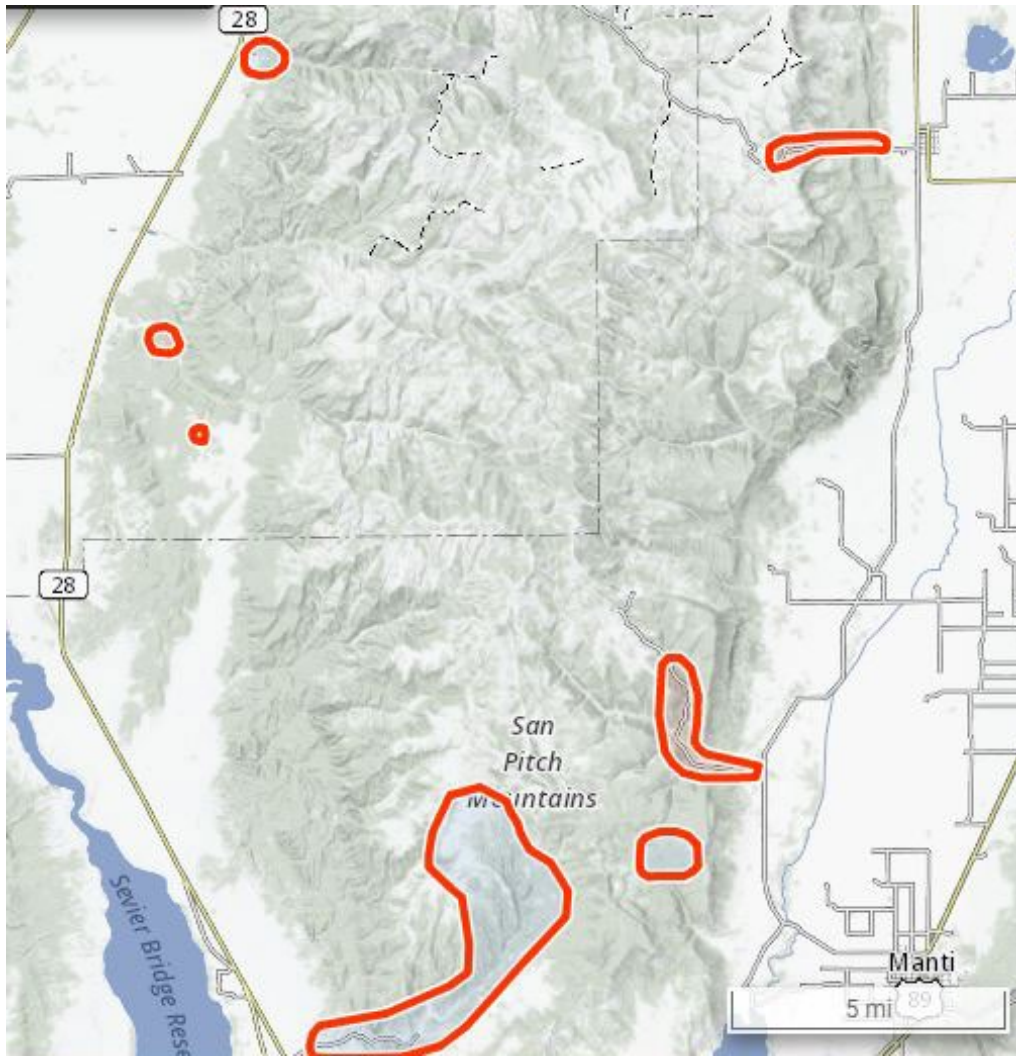


Figure 2. Map of Potential Deer Transplant Sites on the Nebo subunit, San Pitch Mtns.

Disease Management

Investigate and manage diseases that threaten mule deer populations and continue monitoring for chronic wasting disease (CWD) as stated in the statewide plan. This unit is a CWD positive unit. Continue surveillance through check stations and other methods to document prevalence, and location of positive animals.

Limiting Factors (may prevent achieving management objectives)

- Crop Depredation - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- Habitat - Winter range is a limiting factor for deer on this unit. Portions of critical winter ranges are in poor condition (See range trend summary below). Factors contributing to poor range conditions include recent droughts and range use by deer and domestic livestock. This has resulted in a reduction of winter range carrying capacity. Utilization of key shrub species on critical winter ranges will be closely monitored.
- Predation - Follow DWR predator management policy:

-If the population estimate is less than 90% of objective and is stable or decreasing and fawn to doe ratio drops below 70 for 2 of the last 3 years or if the fawn survival rate drops below 50% for one year, then a Predator Management Plan targeting coyotes will be implemented on that subunit. If the population trend is increasing the population must be below 65% of objective and meet the above criteria in order to initiate Predator Management for Coyotes. In 2015, the Central Mountains unit did not qualify for predator management specific to coyotes as the population trend was increasing and was 66% of objective.

- If the population estimate is less than 90% of objective and the doe survival rate drops below 85% for 2 of the last 3 years or below 80% for one year, then a Predator Management Plan targeting cougar would be implemented on that subunit.

- Highway Mortality - Cooperate with the Utah Dept. Of Transportation in construction of highway fences, passage structures and warning signs etc. Collect highway mortality data. A Deer Highway Crossing Study along SR-6 is ongoing. Propose analysis of SR-96, SR-31, and SR-264 to minimize highway mortalities in the future.
- Illegal Harvest - Should illegal kill become an identified and significant source of mortality, attempt to develop specific preventive measures within the context of an Action Plan developed in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Protect, maintain, and/or improve deer habitat through direct range improvements to support and maintain herd population management objectives.
- Work with private landowners and federal, state, and local governments to maintain and protect critical and existing ranges from future losses and degradation through grazing management and OHV and Travel Plan modifications.
- Work with federal, private, and state partners to improve crucial deer habitats through the WRI process.
- Work with federal and state partners in fire rehabilitation on crucial deer habitat through the WRI process.
- Maintain and protect critical winter range from future losses. Acquire critical winter range when the opportunity arises.
- Minimize and mitigate impacts from energy development activities.
- Minimize deer vehicle collisions along highways on the unit.

HABITAT MANAGEMENT STRATEGIES

- Continue to improve, protect, and restore sagebrush steppe habitats critical to deer. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, grazing management, water developments etc. on public and private lands. Habitat improvement projects will occur on both winter ranges as well as summer range.

- Continue to monitor permanent range trend studies located throughout the unit.
- Conduct cooperative seasonal range assessments to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.
- Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of Conservation Easements etc. on private lands.
- Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.
- Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities. Oil and Gas specific habitat biologists will lead this effort.
- Continue to monitor deer survival on this unit through GPS collar studies. Use GPS collar data to determine potential habitat improvement projects.
- Manage vehicle access on Division of Wildlife Resources land to limit human disturbance during times of high stress, such as winter and fawning.
- Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid- to late summer.
- Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by Cheat grass with desirable perennial vegetation.
- Reduce expansion of pinyon-juniper and other woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Manage conifer encroachment on important summer ranges by utilizing prescribed fire.
- Seek opportunities to increase browse in burned areas of critical winter range.
- Utilize antlerless deer harvest to improve or protect forage conditions when vegetative declines are attributed to deer over utilization.

PERMANENT RANGE TREND SUMMARIES – Nebo Subunit

Management Unit Description

This management unit incorporates most of the old North and South Nebo deer herd units and is approximately 943,923 acres in size. Nephi Canyon divides the northern and southern parts of the unit running east to west. A majority of the permanent range trend studies are placed on the western faces of the Wasatch and San Pitch Mountains (Figure 3).

The northern section of the Nebo unit is dominated by high mountains such as Santaquin Peak, Bald Mountain, and Mount Nebo. Mount Nebo represents the southernmost extension of the Wasatch Range. This range

is high and rugged, with steep slopes on the western portion and less steep slopes on the eastern portion of the mountain range. The San Pitch and Valley Mountains make up the majority of the southern portion of the unit. These mountains are lower and less steep than the northern part of the unit with shallow canyons throughout. Towns within this unit include Fountain Green, Moroni, Levan, Fayette, Payson, Chester, Wales and Salem. Towns partially included in the unit include Spanish Fork, Fairview, Mount Pleasant, Ephraim, and Manti.

Limiting Factors to Big Game Habitat

The principal limiting factor and management concern in the Nebo management unit is the lack of winter range in good condition, especially severe winter range on the west side of the unit. In the area from Spanish Fork Canyon south to Nephi, the normal winter range averages two miles or less in width. Severe winter range is even narrower, ranging from a few hundred yards to 1.5 miles in width. However, the winter range on the east and south sides of the unit is more expansive and not nearly as critical.

Some of the major problems related to the limited winter range on the unit (especially low elevation severe winter range) include: restricted access to traditional wintering areas west of I-15, predominantly private ownership of critical ranges (57% of normal winter range), and agricultural depredation. To remedy the situation, the UDWR has acquired approximately 12,800 acres of winter range in the unit (11% of total winter range) and has attempted treatments and rehabilitation projects in these critical areas. The available winter range, especially critical areas on the west side of the unit, remains threatened by urban development and a high fire hazard caused by the presence of significant amounts of cheatgrass (*Bromus tectorum*). As previously mentioned, a major threat to deer winter habitat is the development of winter range on private property. Most of the winter range on the north end of the Nebo unit is privately owned: there is continual expansion of new home construction in the higher elevations of winter range in the communities of Spanish Fork, Salem, Woodland Hills and Elk Ridge. The same is true on the central part of the Nebo Unit, along Water Hollow and Big Hollow; the development there, however, is more for cabin lots and not for residential housing. Both of these areas have historically been very important winter ranges for large populations of mule deer. State- owned WMAs along the east and west side of the unit are important areas of protection. However, these WMAs may prove inadequate to sustain the deer population at the desired objective as private development continues in the future. Therefore, further habitat acquisition and rehabilitation are necessary to adequately maintain the winter range in this management unit.

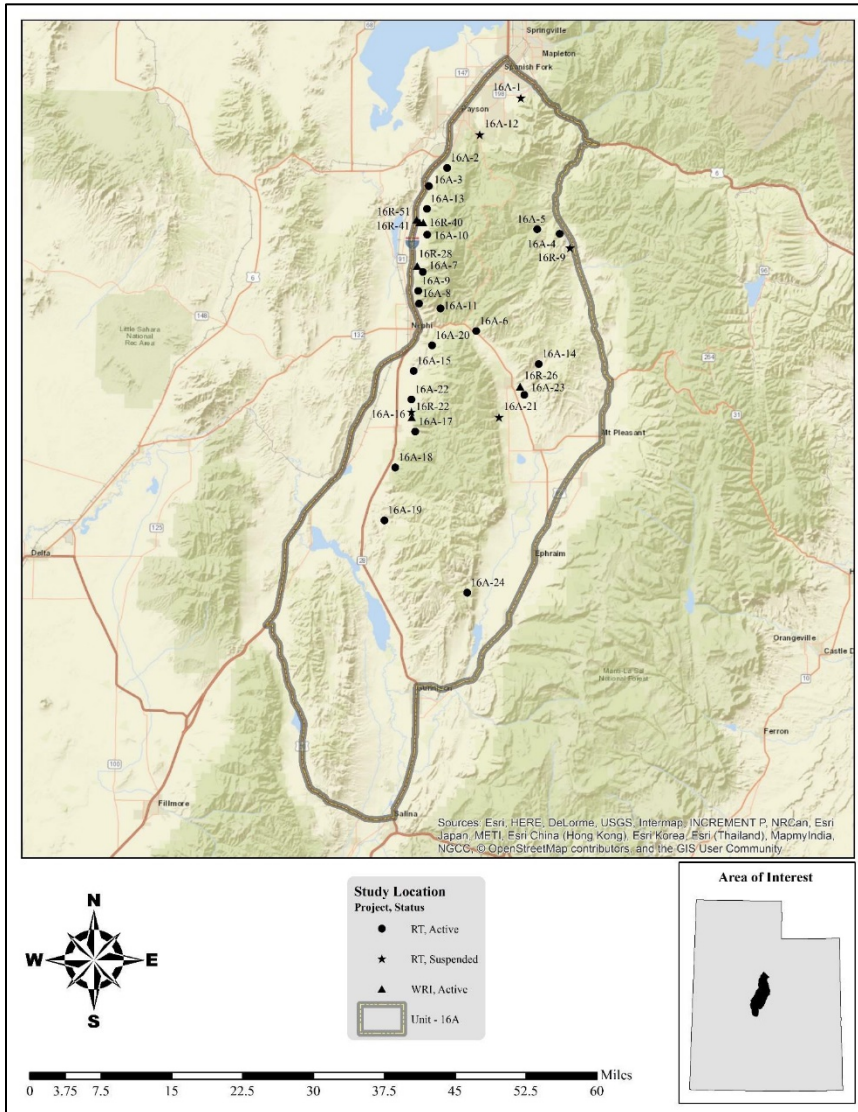


Figure 3. WMU 16A, Nebo, including range trend study sites.

Range Trend Studies

Twenty-one interagency range trend studies were sampled in Unit 16A during the summer of 2017 to establish a Desired Components Index (DCI) ranking for each study site (Figure 4). A total of twenty-four studies have been established within the Unit 16A since 1983. Thirteen studies were established in 1983, and of these studies five sample mixed oak and sagebrush communities, two studies sampled big sagebrush communities, one study samples bitterbrush communities, two studies sample cliffrose communities, and two sample mountain brush communities. Six studies were established in 1989, and of these studies four studies sample big sagebrush communities, one study samples a cliffrose community, and one study samples a mixed oak and sagebrush community. Two studies were established in 2007 and sample Wyoming big sagebrush communities. One study was established in 2012 and samples a pinyon pine and Utah juniper woodland.

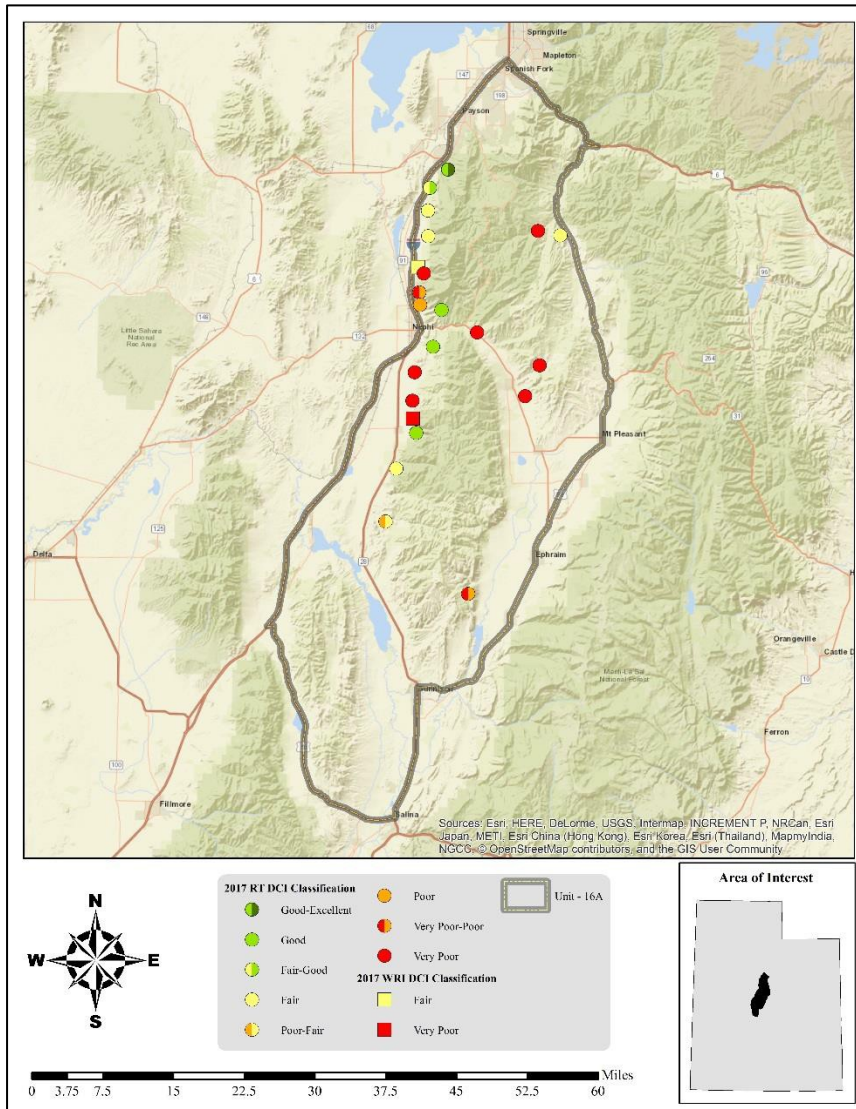


Figure 4. 2017 Desirable Components Index (DCI) ranking distribution by study site for WMU 16A, Nebo.

Discussion and Recommendations

Mountain (Big Sagebrush)

The study sites within the Mountain (Big Sagebrush) ecological type vary in condition from very poor to good for deer winter range habitat. The sagebrush communities support plant populations that provide winter forage for wildlife. Introduced annual grasses are present on all sites in varying amounts. Bulbous bluegrass (*Poa bulbosa*) is also present on all sites within this ecological type and can reduce the ecological integrity and diversity of the plant communities. The Wash Canyon and Triangle Ranch study sites are both in Phase I of woodland encroachment and have potential for future encroachment.

Treatments to reduce the undesirable grasses may become necessary on some sites if these grasses persist on the sites. Areas with conifer encroachment should be treated (e.g. bullhog, chaining, lop and scatter, etc.) where feasible. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Mountain (Oak)

The studies that are considered to be Mountain (Oak) ecological sites vary in condition from very poor to good for deer winter range habitat. The oak communities provide cover and forage for wildlife in winter. Bulbous bluegrass is present on all the sites sampled, and threatens the integrity and diversity of the plant communities. Introduced annual grasses are also present on all sites except Rees Flat: these grasses can increase fuel loads and pose a risk for wildfire. The Santaquin Hill site is currently in Phase I of woodland encroachment and has potential for future encroachment.

Treatments to reduce undesirable grasses may become necessary on some sites if high levels of these grasses persist. Areas with conifer encroachment should be treated (e.g. bullhog, chaining, lop and scatter, etc.) where feasible. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Upland (Big Sagebrush)

The study sites within the Upland (Big Sagebrush) ecological type vary in condition from very poor to very poor-poor for deer winter range habitat on this unit. These lower elevation sagebrush communities support populations that provide winter forage for wildlife. The Old Pinery, Maple Canyon, and Levan North sites are currently in Phase I of woodland encroachment, indicating the potential for future encroachment or infilling. Introduced annual grasses are present on all sites to varying degrees, and can increase fuel loads and pose a risk for wildfire. Bulbous bluegrass is also present on all sites except Maple Canyon: this grass can alter and reduce the diversity of the plant community.

Treatments to reduced undesirable grasses might be necessary if high levels of these grasses persist. It is recommended that areas with significant conifer encroachment be treated (e.g. bullhog, chaining, lop and scatter, etc.) where feasible and maintenance should continue on sites that have already been treated. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Upland (Cliffrose)

Studies that are considered to be Upland (Cliffrose) ecological sites vary in condition from very poor to good for deer winter range habitat on this unit. These cliffrose communities support browse populations that provide good winter forage for wildlife. These communities have the potential for invasion by annual grasses and introduced perennial grasses. Annual grasses, specifically cheatgrass (*Bromus tectorum*), can increase fuel loads and exacerbate the risk for wildfire. The Chicken Creek and Deep Creek study sites are currently in Phase I of conifer encroachment and are at risk for further encroachment.

Treatments to reduce annual grass might be necessary if high levels of these grasses become an issue in these communities. It is recommended that areas with significant conifer encroachment undergo a tree-removing treatment (e.g. bullhog, chaining, lop and scatter, etc.) where feasible. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Treatments/Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 47,250 acres of land have been treated within the Nebo unit since the WRI was implemented in 2004 (Figure 5). An additional 2,636 acres are currently being treated and treatments have been proposed for 1,321 acres. Treatments frequently overlap one another bringing the total completed treatment acres to 51,207 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Anchor chaining to remove pinyon and juniper is the most common management practice in this unit. Bullhog treatments to treat pinyon and juniper are also frequently used. Seeding plants to augment the herbaceous understory is also very common. Other management practices include (but are not limited to): container stock planting, hand crews to remove pinyon and juniper, herbicide application to remove weeds, harrow, and other similar vegetation removal techniques.

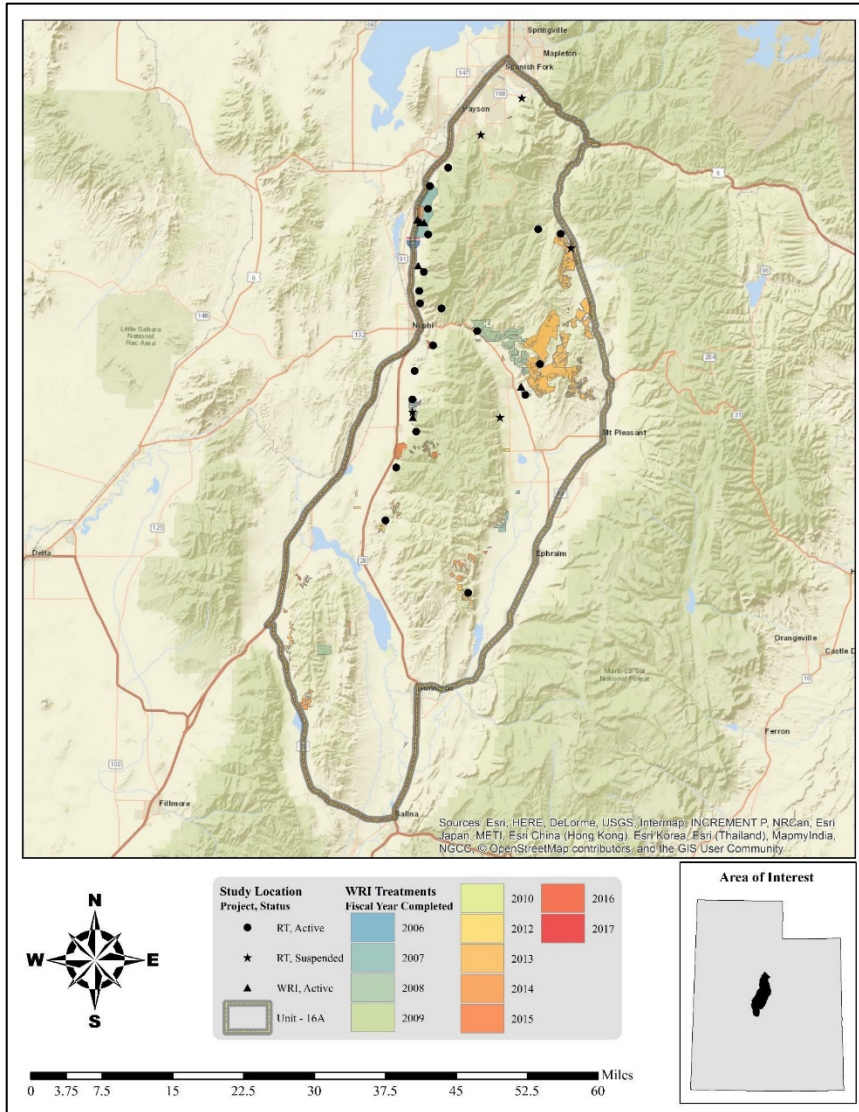


Figure 5. WRI treatments by fiscal year completed for WMU 16A, Nebo

PERMANENT RANGE TREND SUMMARIES - Manti Subunit

Management Unit Description

Geography

Wasatch Plateau

Unit 16B (Figure 6) covers the east and west sides of the Wasatch Plateau. Skyline Drive to Soldiers Summit roughly divides the eastern and western halves of the unit. This unit was previously called the Northeast Manti Deer Herd Unit 30. In the spring of 1998, this unit was incorporated into the much larger Wildlife Management Unit 16. Unit 16C was previously called Deer Herd Unit 31- South East Manti. It was enlarged in the spring of 1998 to include both the east and west sides of the Wasatch Plateau and renamed Wildlife Management Unit 16C. Unit 16C is a subunit of the very large management unit 16, which encompasses areas in Utah, Carbon, Juab, Sevier, and Sanpete Counties.

Wildlife Management Unit 16C (Figure 6) covers the southern portion of the Wasatch Plateau. As with unit 16B, this subunit's western and eastern halves are divided roughly by Skyline Drive. The upper limits of the winter range on 16C generally follows the rim of the plateau and the 9,000 foot level of the south and west exposures of the large canyons and mountain slopes. Many of the plateaus drop steeply to the valley floor below to the very lowest portion of the herd unit that supports a low desert shrub type on unproductive shale hills. This acreage is not considered part of the winter range.

Management unit 16B and 16C is large with deer summer and winter ranges covering nearly 1.4 million acres. The U.S. Forest Service (USFS) administers 81% of the summer range and the BLM 1%. Fifty-one percent of the winter range is on federal land with another 30% on private lands.

Central Mountains Manti North

Most of the winter range in subunit 16B lies on the east side of the Wasatch Plateau which is a broad alluvial fan ranging in elevation from 5500 to 7500 feet. It runs from Price Canyon south to Huntington Canyon. Other important winter ranges include a large section of land along the Price River in the Colton area, and below Scofield Reservoir. The winter range is made up of mountain big sagebrush and wyoming big sagebrush communities with pinyon-juniper woodlands interspersed throughout the area.

Central Mountains Manti South

The key deer wintering areas are the lower end of Muddy Creek and Ferron Creek, Black Dragon, Biddlecome Hollow, Cottonwood Canyon, and Huntington Canyon. Elk winter higher on Trail Mountain, North and South Horn Mountain, Sage Flat and the foot hills along US 89 from salina to Mount Pleasant. Deer also utilize these areas during mild winters. On the Southeast Manti Unit, much of the key winter range is on Forest Service lands. Pinyon-juniper benches become more limited to the south and there are mostly low desert shrub foothills associated with Muddy Creek. Overall, the pinyon-juniper type occupies a fair amount of the winter range at low elevations, but is not critical to the trend monitoring program. However, the chained and seeded portions of this type provide important wintering areas and are monitored for trend. Chaining treatments are sampled in the foothills from Huntington Canyon to south of Dry Wash. Other key areas at Middle and Dry Mountains are also sampled. The big sagebrush/grass range type is found on many key areas, especially on the North East Manti Unit, but also on high elevation elk winter range on Trail, East, and Horn Mountains. Big sagebrush/grass is limited on crucial deer winter range, but key areas are found on Black Dragon and Muddy Creek.

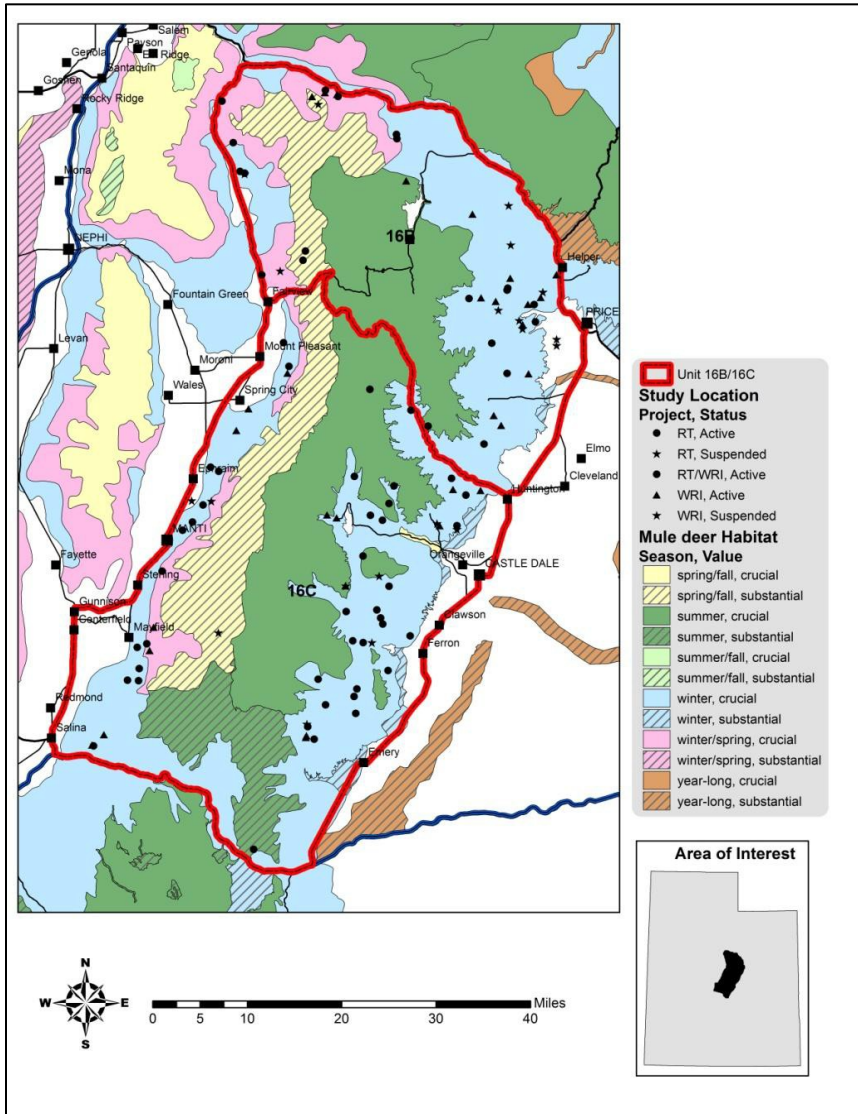


Figure 6. Seasonal Ranges on WMU 16B/16C, Manti Subunit, including range trend study sites.

Limiting Factors to Big Game Habitat

Central Mountains Manti North

The Manti-North area has historically supported a variety of wildlife and outdoor recreation, livestock grazing, ranches and farms, energy developments, and some forest industry. Industrial activities on the unit are associated primarily with coal production, electrical power generation, and oil and gas development. Exploration and development activities for oil and gas have the potential for future increases. Add to this a growing demand for low-sulfur Wasatch coal, and the demands placed upon winter ranges in this area will likely increase. Power plants, pipelines, slack piles, coal load-out facilities, ghost towns, railroads, and agriculture compete for valuable winter range property. An extensive road system provides year-round access to large portions of the winter range. Heavily used access roads to coal mines and gas wells dissect important winter ranges all along the east side of the Wasatch Plateau and are accountable for a large number of the highway deer mortality.

Central Mountains Manti South

The upper portions of the winter range on Forest Service lands are managed primarily for livestock grazing. Widespread watershed rehabilitation through contour trenching and seeding was done on this rangeland in the 1960's. An extensive road system provides access to a large percentage of the winter range. Many roads in crucial areas are open or maintained and used winter long in relation to various activities, namely mining, gas wells, the Horn Mountain TV towers, and for recreation. Access is more restricted further south in the Ferron and Muddy Creek drainages. The lowest foothill ranges are accessible year-round and are usually adjacent to agricultural areas. Coal mining and the power plants are the major economic activities in the area. Other associated impacts include road improvements, truck traffic, and an increased human population. Outdoor recreation is popular in the area. These activities include camping, hunting, fishing, four-wheeling, and snowmobiling and are facilitated by the extensive road system in the mountains and foothills.

Both

Encroachment by pinyon-juniper woodland communities also poses a substantial threat to important sagebrush rangelands. Pinyon-juniper woodlands dominate the vegetation cover within the deer winter range. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease sagebrush and herbaceous cover, and therefore decreases available forage for wildlife.

Range Trend Studies

Range Trend studies have been sampled within WMU 16B and 16C on a regular basis since 1985, with studies being added or suspended as was deemed necessary. Seventy-one interagency range trend studies were sampled in Unit 16B/C during the summer of 2014 to establish a Desired Components Index (DCI) ranking for each study site (Figure 7) Monitoring studies of WRI projects began in 2004. When possible, WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment. Due to the long-term nature of the studies, many of the Range Trend and WRI studies have had some sort of disturbance or treatment prior to or since study establishment.

Range Trend studies that have not had recent disturbance or treatments are summarized in this report by ecological site. Range Trend and WRI studies that have a disturbance or treatment during the reported sample period are summarized in this report by the disturbance or treatment type.

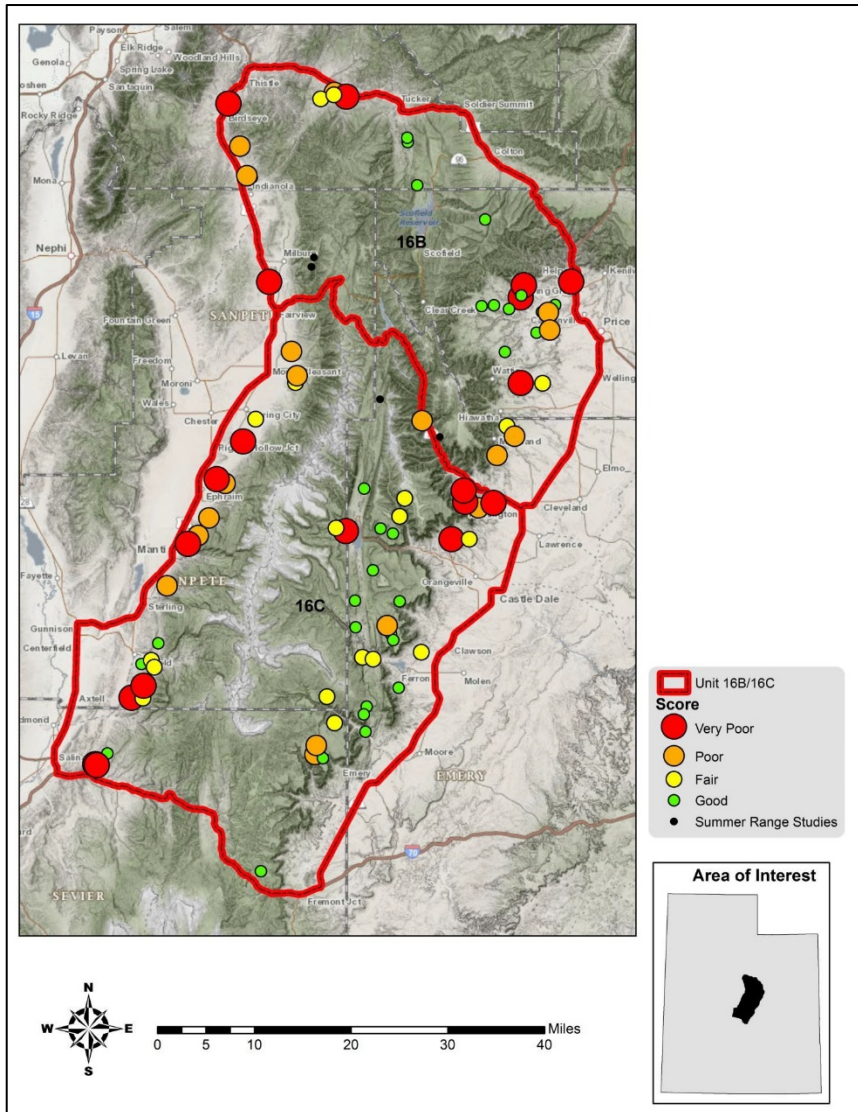


Figure 7. Deer winter range Desirable Components Index (DCI) ranking distribution by study site of most current sample date as of 2014 for WMU 16B/C, Manti North/South.

Discussion and Recommendations

High Mountain (Aspen)

This high mountain ecological site supports an aspen community and is generally considered to be in good condition for deer and elk summer range habitat on the Manti North unit. This community supports a diverse herbaceous understory that provides valuable forage during the summer months. While in generally good condition, introduced perennial grasses are present in the herbaceous understory. While providing valuable forage, these grass species can often be aggressive at higher elevations and can reduce the prevalence and abundance of other more desirable native grass and forb species. Additionally, the presence of noxious weeds, namely hounds tongue, have the potential to expand within the understory and reduce the amount of valuable forb species available to wildlife during summer months.

It is recommended that monitoring of this community continue. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible. Additional actions may be necessary to reduce the presence of noxious weeds within this

community type.

High Mountain (Slender Wheatgrass)

This high mountain ecological site supports grass and forb communities that are generally considered to be in good condition for deer and elk winter range habitat on Manti North unit. This community supports a diverse herbaceous component that provides valuable forage during the summer months. While in generally good condition, introduced perennial grasses are present in the community. Although they provide valuable forage, these grass species can often be aggressive at higher elevations and can reduce the prevalence and abundance of other more desirable native grass and forb species. Additionally, the presence of invasive and noxious weeds, namely tarweed and hounds tongue, have the potential to expand within the herbaceous community and reduce the amount of valuable forb species available to wildlife during summer months.

It is recommended that monitoring of this community continue. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible. Additional actions may be necessary to reduce the presence of noxious weeds within this community type.

High Mountain/Mountain (Mountain Big and Silver Sagebrush Communities)

The higher elevation mountain ecological sites that support sagebrush communities are generally considered to be in good condition for deer winter range habitat on this unit. These communities support robust shrub populations that provide valuable browse in mild and moderate winters. These sites are not prone to encroachment from pinyon-juniper trees or invasion of cheatgrass. As with the ecological potentials mentioned above, introduced perennial grasses are often the dominant herbaceous component on these study sites. While providing valuable forage, these grass species can often be aggressive at higher elevations and can reduce the prevalence and abundance of other more desirable native grass and forb species. Intensive herbivore may also lead to a weakened herbaceous community structure that can result in the introduction of invasive and noxious weeds that reduce the amount of valuable forb species available to wildlife during summer months.

It is recommended that monitoring of this community continue. If habitat rehabilitation is needed in these community types, it is likely not necessary to seed these forb communities due to their high diversity and resilience to disturbance. If reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible. Monitoring should also continue in order to watch for the presence of noxious weeds within this community type.

Upland (Pinyon-Utah Juniper)

The mid elevation upland pinyon and juniper communities are generally considered to be in poor to very poor condition for deer winter range habitat on these units. These communities support small, dispersed shrub populations that provide valuable browse in mild to moderate winters. These communities are prone to increases of pinyon-juniper tree density and cover as community phases climax. Climax community phases have reduced understory diversity and vigor, and shrub populations display high decadence and low densities if the progression is not set back through pinyon and juniper tree removal. As with the high potential mountain sites, these upland mid-potential sites have introduced perennial grasses present in the herbaceous understory. While providing valuable forage, these grass species can often be aggressive at higher elevations of these upland potentials and can reduce the prevalence and abundance of other more desirable native grass and forb species. Annual grass,

primarily cheatgrass, can also be an issue within these communities. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire within these communities. If wildfire occurs within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow.

It is recommended that work to reduce pinyon-juniper should continue in these communities in order to diversify community structure and increase the availability of preferred browse in these crucial winter ranges for when winters are harsh. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible. Care should also be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites. Furthermore, work to diminish fuel loads and create fire breaks should continue in order to reduce the threat of catastrophic fire.

Upland (Shrub Communities)

These mid elevation upland communities are generally variable in deer winter range with many of the communities in poor to very poor condition; however, there are a few communities that are considered to be in good to excellent condition. These communities support many vegetation types including the following: black sagebrush, basin big sagebrush, Wyoming big sagebrush, mountain big sagebrush, antelope bitterbrush, and mahogany species. These communities support large, dense shrub populations that provide valuable browse in mild to moderate winters for deer. These communities are prone to encroachment from pinyon-juniper trees which can reduce understory shrub and herbaceous health if not addressed. As with the high potential mountain sites, these upland mid-potential sites have introduced perennial grasses present in the herbaceous understory. These grass species can often be aggressive at higher elevations of these upland potentials and can reduce the abundance of other more desirable native grass and forb species. Annual grass, primarily cheatgrass, can also be an issue within these communities. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire within these communities. If wildfire occurs within these communities they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow.

Although most of the communities have small populations of pinyon and juniper trees, it is strongly recommended that work to prevent and reduce pinyon-juniper encroachment should continue in these communities. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible. Moreover, care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites. Work to diminish fuel loads and create fire breaks should continue in order to reduce the threat of catastrophic fire that results in the loss of preferred browse. If a treatment to rejuvenate sagebrush occurs, care should be taken in selecting treatment methods that will not increase annual grass loads.

Semidesert (Birchleaf Mahogany, Black Sagebrush, and Shadscale)

The lower elevation semidesert shrub communities are generally considered to be in poor condition for deer winter range habitat on the unit. These communities support shrub populations that provide valuable browse in moderate to severe winters. These communities are susceptible to invasion from annual grasses, primarily cheatgrass. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire on within these communities. If wildfire occurs within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. Encroachment from pinyon-juniper trees is a moderate threat within these communities.

If a treatment to rejuvenate sagebrush occurs, care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites. Treatments to establish and increase browse species more rapidly following wildfire should also be implemented, and treatments to increase browse species on historic fires should be considered.

Treatments/Restoration Work

There has been an active effort to address many of the limitations on these units through the Watershed Restoration Initiative (WRI). A total of 36,336 acres of land have been treated within the Manti North and South units since the WRI was implemented in 2004 (Figure 8). As seen on the map, treatments occasionally overlap one another bringing the total treatment acres to 38,043 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Treatments to reduce pinyon-juniper woodlands such as bullhog, chaining, and lop-and-scatter are common management practices on this unit. Other common management treatments are those to rejuvenate sagebrush stands such as herbicide, disc, and harrow treatments. In addition to these treatments, many have had seeding treatments associated with it to increase desirable species.

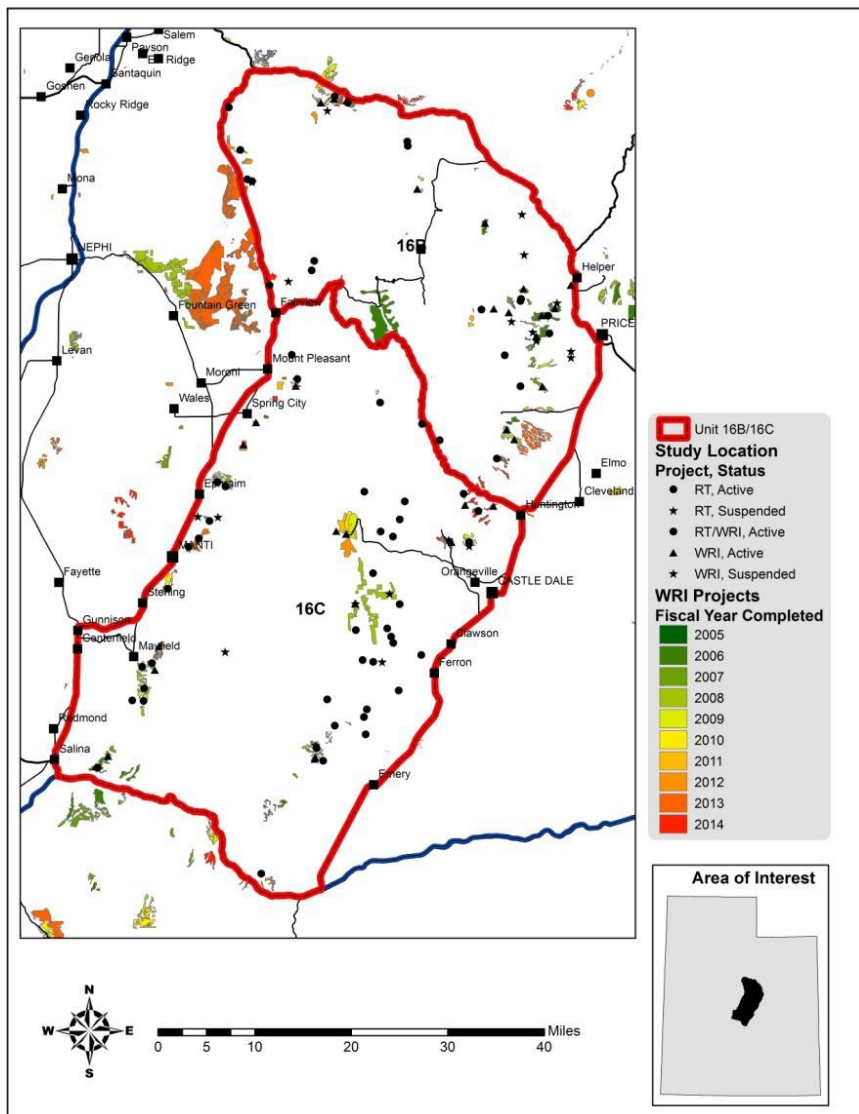


Figure 8. WRI treatments by fiscal year completed for WMU 16B/C,

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 20
Southwest Desert
2020

BOUNDARY DESCRIPTION

Beaver, Iron, and Millard counties - Boundary begins at US-50&6 and the Utah-Nevada state line; east on US-50&6 to SR-257; south on SR-257 to SR-21; south on SR-21 to SR-130; south on SR-130 to I-15; south on I-15 to SR-56; west on SR-56 to the Lund Highway; northwest on the Lund Highway to the Union Pacific railroad tracks at Lund; southwest on the Union Pacific railroad tracks to the Utah-Nevada state line; north on this state line to US-50&6.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Year-long range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	0	0%	0	0%
Bureau of Land Management	132752	95%	711554	84%	167425	85%
Utah State Institutional Trust Lands	6650	5%	92989	11%	16492	8%
Native American Trust Lands	0	0%	0	0%	0	0%
Private	645	<1%	36326	4%	9788	5%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	0	1%	6775	1%	3487	2%
TOTAL	140047	100%	847644	100%	197192	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size - Manage for a 5-year target population of 3,500 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels. Change to the population objective is based on this population's performance, improved range

conditions, the amount of available habitat and the lack of range damage from deer. The population objective is being adjusted to a more realistic and obtainable goal for the next five years.

Unit 20

1994-2001 Objective: 4,000
 2002-2014 Objective: 3,200
 2015-2020 Objective: 4,000
 2021-2025 Objective: 3,500
 Change from last plan -500

- Herd Composition - This is a General Season unit and will be managed to maintain a three-year average postseason buck to doe ratio of 18-20 according to the statewide plan. This unit typically exceeds the 20 bucks per 100 doe threshold post season. It is a difficult unit to obtain a large enough sample size for this analysis. Caution will be use when adjusting permits and trends will be considered.
- Harvest - General Buck Deer hunt regulations, using archery, rifle, and muzzleloader hunts apply.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 post-season model estimates the population at 3,000 deer. The 10-year average population estimate is 2440.
- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey and the use of checking stations. Achieve the target population size by use of antlerless harvest using a variety of harvest methods and seasons. Recognize that buck harvest will be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck:doe ratios

Year	Buck harvest	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2017	232	48.5	23.5	2,900	4,000	72.5%
2018	280	32.1	20.6	3,000	4,000	75%
2019	155	50.0	20.4	3,000	4,000	75%
3 Year Avg	222	43.5	21.5			

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- Habitat - Public land winter range availability, landowner acceptance and forage conditions will determine herd size. Excessive habitat utilization will be addressed with hunting. The Southwest Desert is a summer range limited unit. Winter range is abundant.
- Predation - Follow DWR predator management policy:
 - This unit is currently under a Predator Management Plan. Coyotes are being targeted by Wildlife Services. Cougars are being hunted beginning the fall of 2020 under an unlimited harvest strategy.
- Highway Mortality - Cooperate with the Utah Dept. Of Transportation in construction of highway fences,

passage structures and warning signs etc. Highway mortality is not a limiting factor on this unit.

- **Illegal Harvest** - If illegal harvest is identified as a significant source of mortality, an attempt to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain or enhance forage production through direct range improvements on winter and summer deer range throughout the unit to achieve population management objectives.
- Maintain critical fawning habitat in good condition. Fawn recruitment is a major concern on this unit and may be the single greatest factor limiting the population.
- Work with federal and state partners in fire rehabilitation and prevention on crucial deer habitat using habitat improvements and reseeding efforts.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.
- Continue existing monitoring studies, and coordinate with BLM on additional riparian monitoring.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to oil and gas development, wind energy, solar energy, and transmission line construction.
- Coordinate with federal and state partners in designing projects that will improve fire resiliency and protect areas of crucial habitat.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands. Continue working toward blocking up UDWR properties through land exchange.
- Manage vehicle access on Division of Wildlife Resources land to limit human disturbance during times of high stress, such as winter and fawning.
- Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid- to late summer.
- Work with BLM to support wild horse removals where there are conflicts with Mule Deer.

Habitat Improvement

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by Cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Seek opportunities to increase browse in burned areas of critical winter range.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Seek out opportunities to improve the limited summer range across the unit. Consider summer range habitat improvement projects that remove encroaching trees, improves succulent vegetation and wet meadow habitat, increases aspen recruitment, enhances and/or protects riparian areas, use prescribed fire to promote early succession habitats where appropriate.
- Future habitat work should be concentrated on the following areas.
 - Hamlin Valley and the surrounding areas covered by the BLM's 2014 Habitat Improvement Environmental Assessment
 - Retreatment of older treatments (>10years) to protect investment through maintenance.
 - Habitat improvements in the Indian Peak, Wah Wah, and Mountain Home crucial summer habitats.
 - Look for opportunities to implement habitat improvements for deer in the northern half of the unit.

RANGE TREND SUMMARY

Management Unit Description

Geography

The Southwest Desert management unit encompasses the Indian Peaks and Sevier Desert area; significant amounts of this unit serve as big game range. The permanent range trend studies are primarily located on the Indian Peak Range and the Wah Wah Mountains. Many of these sites are located on the summer range as this unit is summer-limited. Towns located within this unit include Modena, Garrison, Beryl, Milford and Minersville as well as parts of Cedar City, Hinckley, and Enoch.

The topographic features of this unit include the Indian Peak, Needle, House, Confusion, and Mountain Home Ranges as well as the Wah Wah Mountains. The highest peak in the unit is Indian Peak at 9,765 feet.

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 6 inches along portions of upper Wah Wah Valley and Upper Pine Valley to 23 inches on the top of Indian Peak and Twin Peaks. All of the Range Trend and WRI monitoring studies on the unit occur between 13-22 inches of precipitation.

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the Western and South Central Mountains divisions (Divisions 1 and 4).

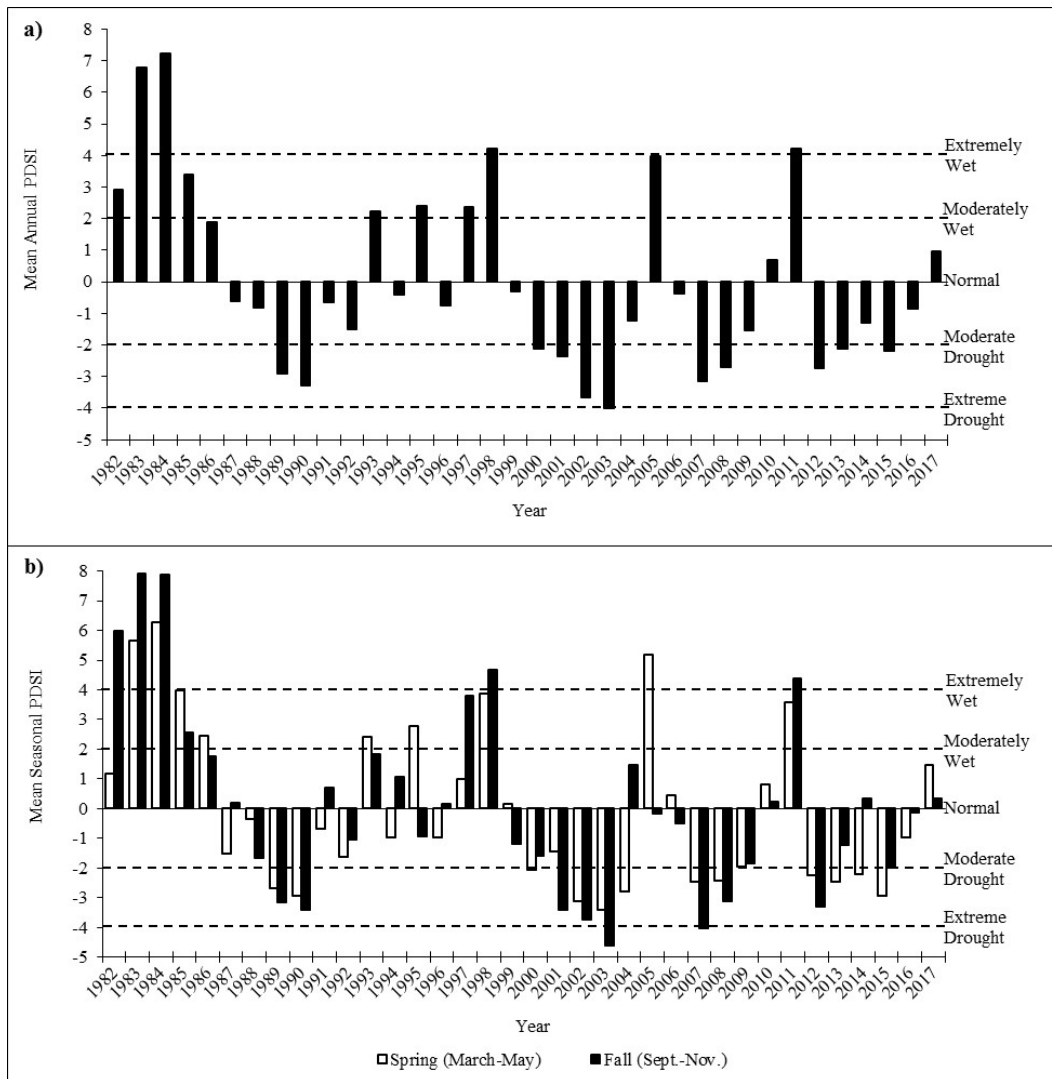


Figure 1.1: The 1982-2017 Palmer Drought Severity Index (PDSI) for the Western division (Division 1). The PDSI is based on climate data gathered from 1895 to 2017. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2018).

Summer Range

Much of the summer range in Indian Peaks is in mixed mountain brush communities and aspen/conifer communities. Some of the rocky upper elevation sites are dominated by curleaf mountain mahogany. Much of the winter range is composed of sagebrush with the shallow sites often being composed of black sagebrush and the deeper soils mostly being mountain big sagebrush. Much of the winter range in the Southwest Desert unit borders the edge of pinyon-juniper communities. These tree communities which provide thermal cover for animals, but also pose a risk for encroachment. This unit is similar to other desert units in that it is primarily limited by the lack of quality summer range for both deer and elk.

Winter Range

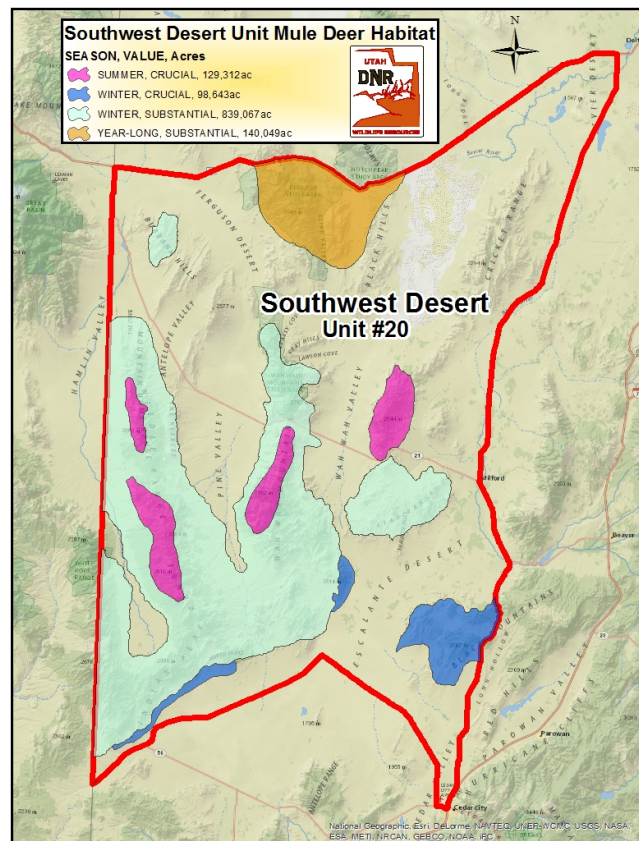
The winter range for deer in this unit consists of the areas around the Indian Peak Range and the Wah Wah Mountains. Elevations for this winter range vary from 5,200 feet to 8,000 feet.

Limiting Factors to Big Game Habitat

Major human activities in the area include grazing, mining, agriculture, and recreation. Habitat degradation and loss, lack of summer habitat, non-game ungulate competition for forage, and winter range conditions limit big game habitat in this unit. Encroachment by pinyon-juniper woodland communities poses a threat to important sagebrush rangelands. According to the current Landfire Existing Vegetation Coverage model, 20.84% of the Southwest Desert unit is comprised of pinyon-juniper woodlands, but in comparison to sagebrush, these woodlands are significant in size. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease sagebrush and herbaceous cover, therefore negatively impacting the availability of wildlife forage (Miller, Svejcar, & Rose, 2000). Feral horses are a significant problem across the unit, with many sites showing extremely high occupancy by horses. In large numbers, horses can degrade range conditions by overutilization and trampling.

Other limiting factors to big game include introduced exotic herbaceous species such as cheatgrass (*Bromus tectorum*). The current Landfire Existing Vegetation Coverage model indicates that 3.99% of the unit is comprised of exotic herbaceous species: this is more troublesome on the lower elevation sites. Increased amounts of cheatgrass can exacerbate the risk for catastrophic wildfire (Balch, D'Antonio, & Gómez-Dans, 2013).

SOUTHWEST DESERT MULE DEER HABITAT



Range Trend Studies

Range Trend studies have been sampled within WMU 20 on a regular basis since 1985, with studies being added or suspended as was deemed necessary (Table 6.7). Due to changes in sampling methodologies, only data collected following the 1992 sample year is included in this summary. Monitoring studies of WRI projects began in 2004; when possible WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment. Due to the long-term nature of the studies, many of the Range Trend and WRI studies have had some sort of disturbance or treatment prior to or since study establishment (Table 6.8).

Range Trend studies that have not had recent disturbance or treatments are summarized in this report by ecological site or potential. Range Trend and WRI studies that have a disturbance or treatment during the reported sample period are summarized by the disturbance or treatment type. For a comprehensive report for each treatment type associated with the range trend site please refer to the full report. The full report can be viewed at the UDWR’s regional office in Cedar City, Utah or at the UDWR Headquarters in Salt Lake City. An online version of the report will become available and currently you can access most of the results online at:

https://wildlife.utah.gov/.../range-trends/.../2017_Central_Region_Unit_Summary_Report.pdf

Deer Winter Range Condition Assessment

The condition of deer winter range within the Southwest Desert management unit has continually changed on the sites sampled since 1998. The active Range Trend sites sampled within the unit are considered to be in very poor to fair-good condition as of the 2017 sample year (**Figure 6.19, Table 1.10**). South Spring improved to fair-good condition, while Lower Indian Peak and Lamerdorf Canyon are considered to be in fair condition. Mountain Home Seeding is classified as being in poor-fair condition and Mustang Spring is considered to be in very poor condition. The poor condition sites are considered as such generally due to a lack of perennial grasses and either a lack of preferred browse cover or decadence of preferred browse. The treated sites have generally shown improvement in condition as time since treatment has increased (**Figure 6.20, Table 1.11**). The exception is Blawn Wash Dixie, which has remained in fair condition. It is possible given more time and continual monitoring that these sites will (continue to) improve.

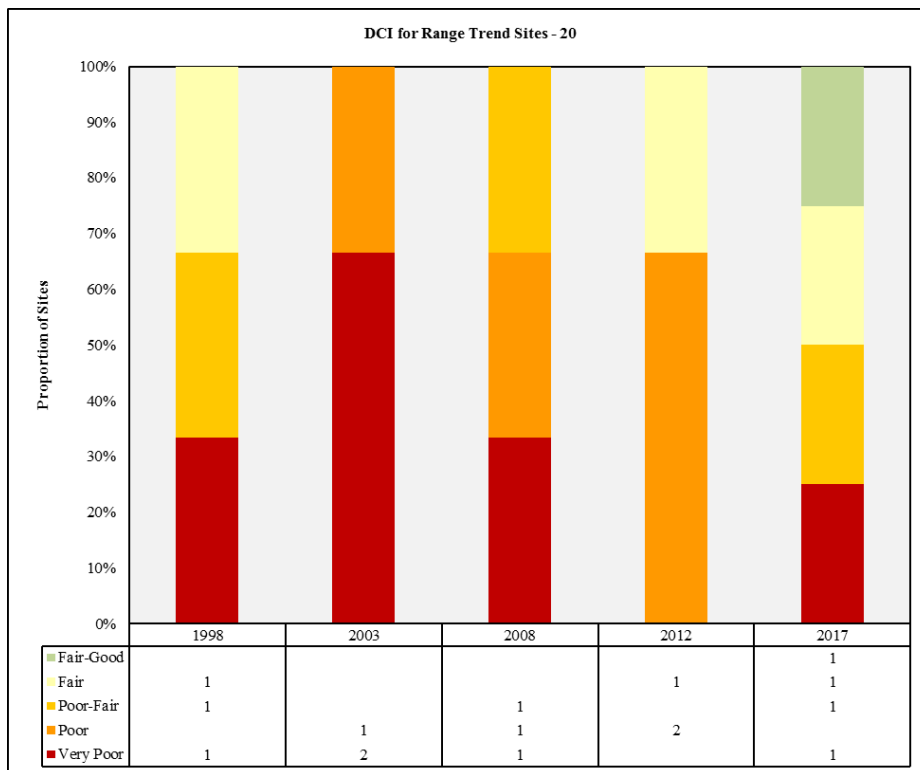
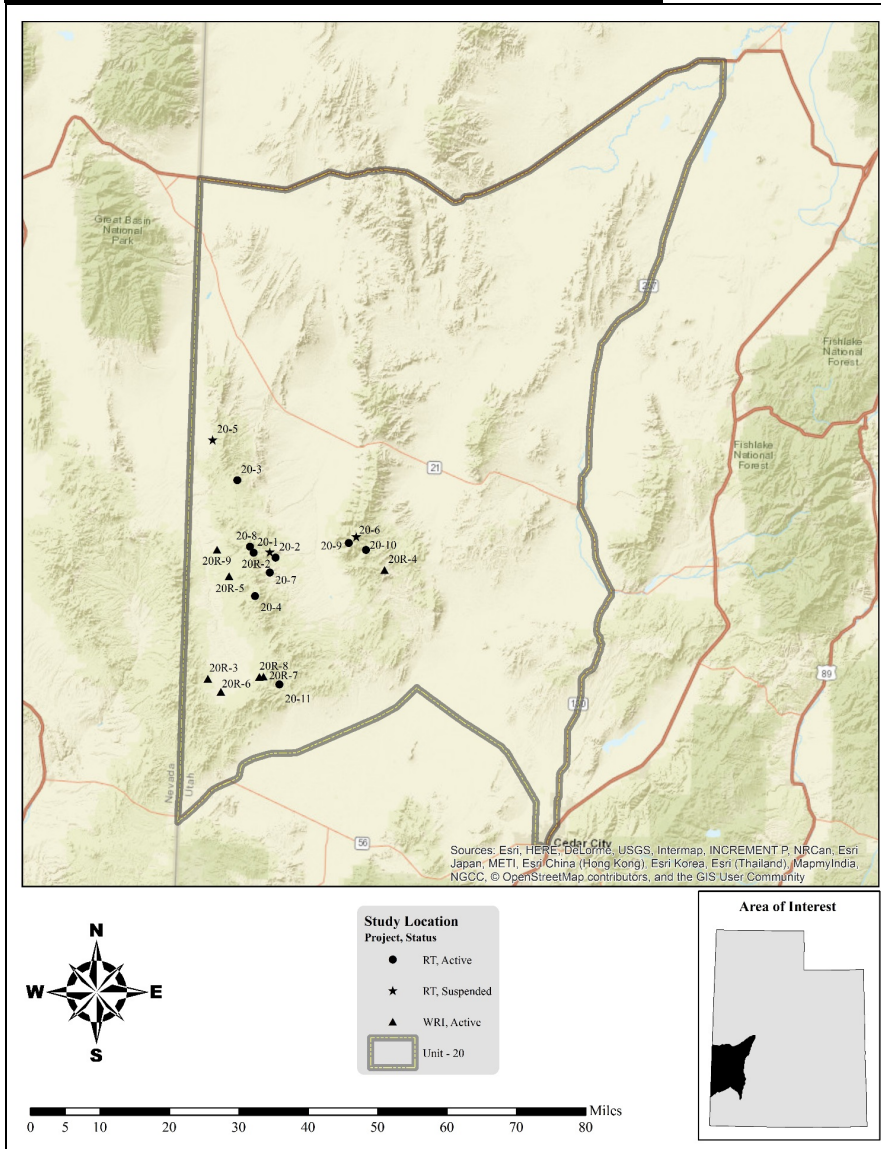


Figure 6.2: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 20, Southwest Desert.

Range Trend Study Locations – Long Term and WRI



Condition and Recommendations

Mountain (Big Sagebrush)

The studies that are considered to be of the Mountain (Big Sagebrush) ecological type are classified as deer winter range. These studies are considered to be in poor-fair to fair-good condition. These communities are host to shrub populations that can support deer and elk during the winter season. Both of these sites have some annual grass present, with more being present on the South Spring study. These sites were treated with prescribed fire in the 1980's and 90's to remove tree cover. However, pinyon-juniper communities are present at the edges of both of these sites, indicating a risk for future encroachment. Due to heavy grazing pressure, feral horse usage is a management issue on these sites.

It is recommended that areas with high levels of conifer encroachment or infill be treated with a tree-removing disturbance (e.g. bullhog, chaining, lop and scatter, etc.). Areas with high cover of annual grass should be monitored and if these levels are sustained, treatments to remove these species are advisable to reduce these species; changes in grazing management or herbicide treatments are possible management tools. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Mountain (Browse)

Most of the studies in the Mountain (Browse) ecological type are not considered to be winter range, with Lamerdorf Canyon being the exception. These communities support robust browse and herbaceous species that provide varied feed for summering animals. Pinyon-juniper communities are present on all the sites and are currently considered to be in Phase I encroachment. Feral horse usage is a significant issue on these sites, due to the heavy grazing pressure that these animals display on sites. Annual grasses are present on some of the sites and Merrill's Camp had high cover of cheatgrass in both years that it was sampled. These grasses can increase fuel loads and raise the risk of wildfire.

It would be recommended to treat areas with conifer encroachment or infill (e.g. bullhog, chaining, lop and scatter, etc.). Areas with high cover of annual grass should be monitored and if these levels are sustained, treatments would be advisable to reduce these species. Changes in grazing management or herbicide treatments are management tools that could be used. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Mountain (Low Sagebrush)

The lone Mountain (Low Sagebrush) ecological site is considered to be summer habitat for deer and year-long habitat for elk. This community supports shrub and herbaceous components that provide a variety of feed for big game. As the Desirable Components Index is based on mule deer winter range, it is not used for this site. The site had good cover of perennial grasses and forbs with no invasive species present. In addition, good cover of preferred browse species has been observed. Feral horse usage associated with heavy grazing is a significant issue on this site.

No specific threats were identified for this study site. However, grazing should be monitored on this site and other areas within this ecological type; overgrazing can cause ecological issues such as erosion, reduced plant vigor, and changes to the plant community as a whole.

Upland (Big Sagebrush)

The study considered to be of the Upland (Big Sagebrush) ecological type is in very poor condition for deer winter range. Lack of preferred browse and low cover of perennial grass are contributing factors to the unsatisfactory condition of this site. Pinyon-juniper communities are present and this site is currently considered to be in Phase I of woodland encroachment. Feral horses are also a concern on this study as they exert heavy grazing pressure. In addition, annual grasses are present and contribute moderate cover: these grasses can increase fuel loads and raise the risk of wildfire.

In areas with conifer encroachment or infill, a tree-removing disturbance is recommended (e.g. bullhog, chaining, lop and scatter, etc.). Areas with high cover of annual grasses should be monitored and if these levels are sustained, treatments are advisable to reduce these species. Changes in grazing management or herbicide treatments are possible treatment tools to manage annual grasses. If reseeding is necessary to restore herbaceous communities, care should be taken in seed selection and preference should be given to native species when possible.

Upland (Black Sagebrush)

Although pinyon and juniper reduction treatments have taken place on this mid-elevation study site, it is likely that encroachment is occurring on other areas within this ecological type. Undesirable annual and perennial grasses have increased within the herbaceous community. These species pose a threat to the resilience of the ecological system as they can shift the dynamics of the plant community, with annual grass monocultures and more frequent wildfires being a concern. Bulbous bluegrass (*Poa bulbosa*) has been sampled on this site: this introduced perennial grass species can create monocultures and outcompete more desirable native species.

It is recommended that treatments for pinyon-juniper (e.g. bullhog, chaining, lop and scatter, etc.) be implemented in areas where it would be beneficial to the habitat. For the herbaceous understory, herbicide treatments and grazing management changes are possible treatments for the undesirable graminoid species. If

reseeding is needed to restore the herbaceous communities on these sites, care should be taken in seed selection and preference should be given to native species when possible.

Treatments/Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 71,306 acres of land have been treated within the Southwest Desert unit since the WRI was implemented in 2004. An additional 21,981 acres are currently being treated and treatments have been proposed for 12,537 acres. Treatments frequently overlap one another bringing the total treated land area to 100,931 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

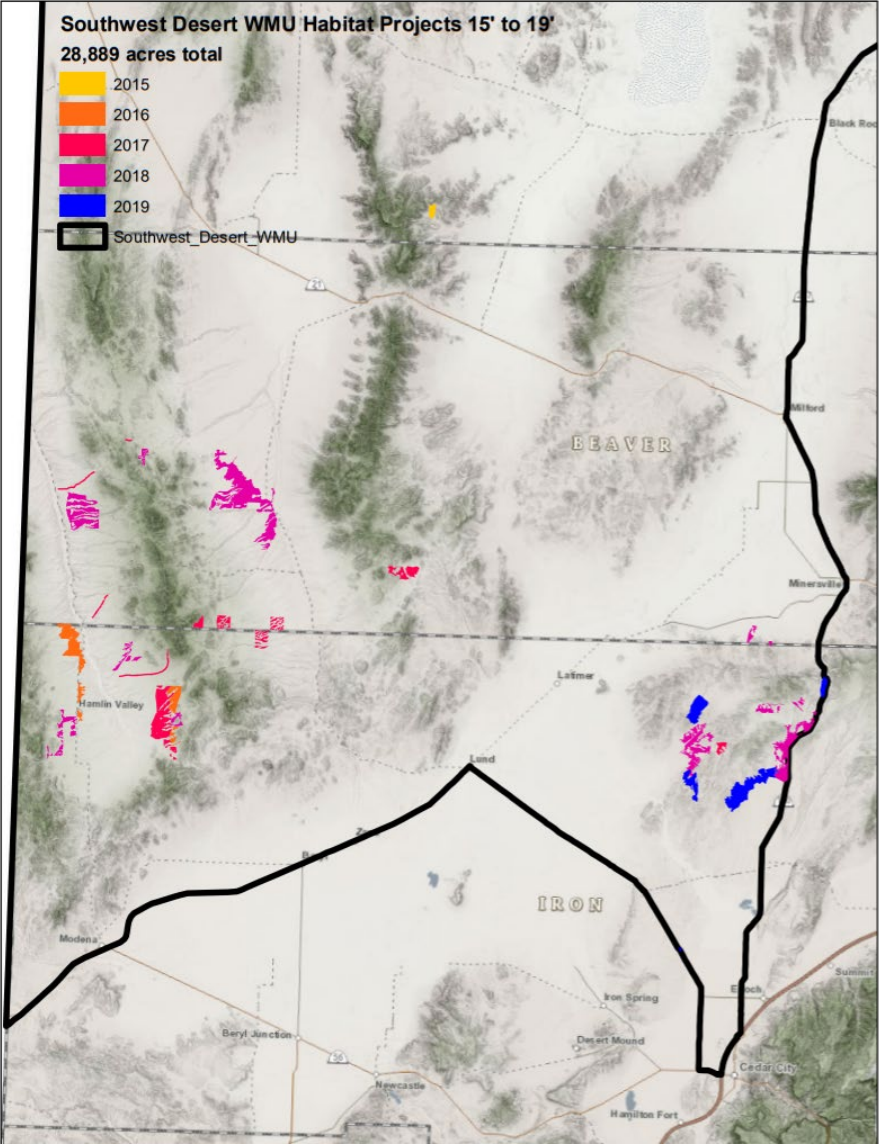
Anchor chaining to remove pinyon and juniper is the most common management practice in this unit. Seeding plants to augment the herbaceous understory is also very common. Other management practices include (but are not limited to): bullhog, lop and scatter, harrowing, discing, herbicide application, interseeding, and mowing.

Type	Completed Acreage	Current Acreage	Proposed Acreage	Total Acreage
Anchor Chain	48,089	5,909	0	53,997
Ely (One-Way)	39,422	0	0	39,422
Ely (Two-Way)	8,666	5,909	0	14,575
Bullhog	3,219	6,274	6,193	15,686
Full Size	3,148	6,274	6,193	15,616
Skid Steer	70	0	0	70
Disk	447	0	0	447
Off-Set (Two-Way)	169	0	0	169
Plow (Two-Way)	278	0	0	278
Harrow	3,400	0	0	3,400
≤ 15 ft. (One-Way)	746	0	0	746
≤ 15 ft. (Two-Way)	1,028	0	0	1,028
> 15 ft. (One-Way)	1,066	0	0	1,066
> 15 ft. (Two-Way)	560	0	0	560
Herbicide Application	1,214	0	0	1,214
Aerial (Fixed-Wing)	1,214	0	0	1,214
Interseeding	0	120	0	120
Mowing	0	25	0	25
Other	0	25	0	25
Seeding (Primary)	8,561	0	0	8,561
Broadcast (Aerial Fixed-Wing)	7,925	0	0	7,925
Drill (Rangeland)	633	0	0	633
Hand Seeding	3	0	0	3
Seeding (Secondary/Shrub)	786	0	0	786
Hand Seeding	786	0	0	786
Vegetation Removal/Hand Crew	5,591	9,654	6,344	21,589
Lop and Scatter	5,591	9,654	6,344	21,589
Total Treatment Acres	71,306	21,981	12,537	105,824
*Total Land Area Treated	67,636	20,758	12,537	100,931

Table 6.1: WRI treatment action size (acres) for completed, current, and proposed projects for WMU 20, Southwest Desert. Data accessed on 02/09/2018.

*Does not include overlapping treatments.

2015 – 2019 Habitat Project Areas



MULE DEER HERD UNIT MANAGEMENT PLAN
Herd Unit #21A
Oak Creek, Limited Entry Unit
2020

BOUNDARY DESCRIPTION

Juab and Millard counties - Boundary begins at SR-50 and I-15 near Holden; north on I-15 to the Mills road; west on this road to the railroad tracks; west on these tracks to the Sevier River; north along this river to SR-132; west on SR-132 to SR-125 (300 East in Leamington); south on SR-125 to McCormick Road (CR-4549); south on this road to Whiskey Creek Road; southeast on this road to SR-50 in Holden; north on SR-50 to I-15. Excludes all CWMUs.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

OWNERSHIP	Year-Long Range		Summer Range		Winter Range	
	AREA (acres)	%	AREA (acres)	%	AREA (acres)	%
Forest Service	0	0%	111,072	86%	0	0%
Bureau of Land Management	3,106	50%	7,283	11%	10,931	25%
Utah State Institutional Trust Lands	42	1%	242	2%	10,839	25%
Native American Trust Lands	0	0%	0	0%	0	0%
Private	2,487	49%	867	2%	29,382	50%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%
TOTALS	5,635	100%	119,462	100%	51,152	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Manage for a 5-year target population of **2,000** wintering deer (modeled number) during the five-year planning period; unless range conditions become unsuitable as evaluated by DWR. This is a decrease from the 2015 plan which was 2,500. The 10-year average is 1,980. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.

Herd Composition – This is a Limited Entry unit and will be managed to maintain a three year average postseason buck to doe ratio of **25-35** according to the statewide plan.

Harvest – Limited Entry Buck Deer hunt regulations will be used to maintain and work towards objectives on this unit. Hunting strategies will include using Archery, Rifle, and Muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason classification and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 model estimates the population at 1,500 deer.
- Buck Age Structure - Monitor age class structure of the buck population through the use of, mandatory reporting requirements, checking stations, postseason classification, statewide harvest survey data and bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide harvest survey and the use of checking stations.

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation – Strategies will be implemented to mitigate crop depredation as prescribed by state law and DWR policy.
- Habitat – The amount and condition of summer habitat on public lands, landowner acceptance and winter forage conditions will determine herd size. Excessive habitat utilization will be addressed through antlerless removal.
- Predation - If predation is determined to be a limiting factor, efforts to limit predation will be taken according to DWR predator management policy.
- Highway Mortality – DWR will cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures and warning signs etc if needed. Currently, highway mortality is not a limiting factor on this unit.
- Illegal Harvest - If illegal harvest is identified as a limiting factor, a unit specific action plan will be develop in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain or enhance forage production through direct range improvements on winter and summer deer range throughout the unit to achieve population management objectives.
- Maintain critical fawning habitat in good condition. Fawn recruitment is a major concern on this unit and may be the single greatest factor limiting the population.

- Work with federal and state partners in fire rehabilitation and prevention on crucial deer habitat through the WRI process

HABITAT MANAGEMENT STRATEGIES

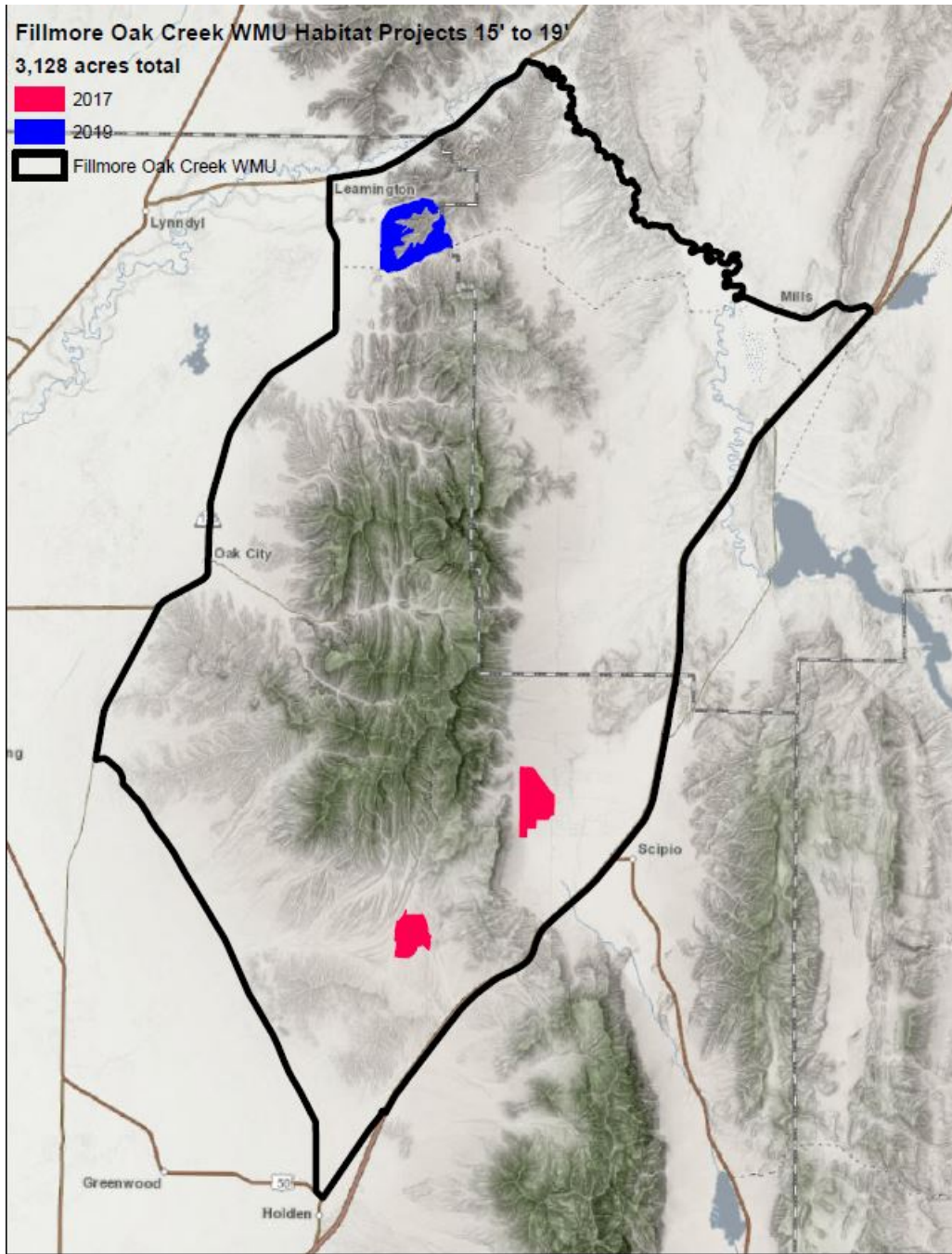
Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range desirable component index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. However, the relationship between DCI and the changes in deer carrying capacity is difficult to quantify.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Coordinate with federal and state partners in designing projects that will improve fire resiliency and protect areas of crucial habitat.
- Work toward long-term habitat protection and preservation through agreements with land management agencies and local governments, the use of conservation easements, etc. on private lands and working toward blocking up UDWR properties through land exchanges with willing partners.
- Manage vehicle access on Division of Wildlife Resources land to limit disturbance critical times such as winter and fawning.
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and to provide refuges.
- Future habitat work should be concentrated on the following areas.
 - Seek to increase browse in burned areas of critical winter range.
 - Summer range improvement and expansion.

Habitat Improvement Projects



PERMANENT RANGE TREND SUMMARIES

DWR Winter Range Trend Assessment

The condition of deer winter range within the Fillmore - Oak Creek management unit has continually changed on the sites sampled since 1997. The active Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2017 sample year. It is possible given more time and continual monitoring that these sites will (continue to) improve.

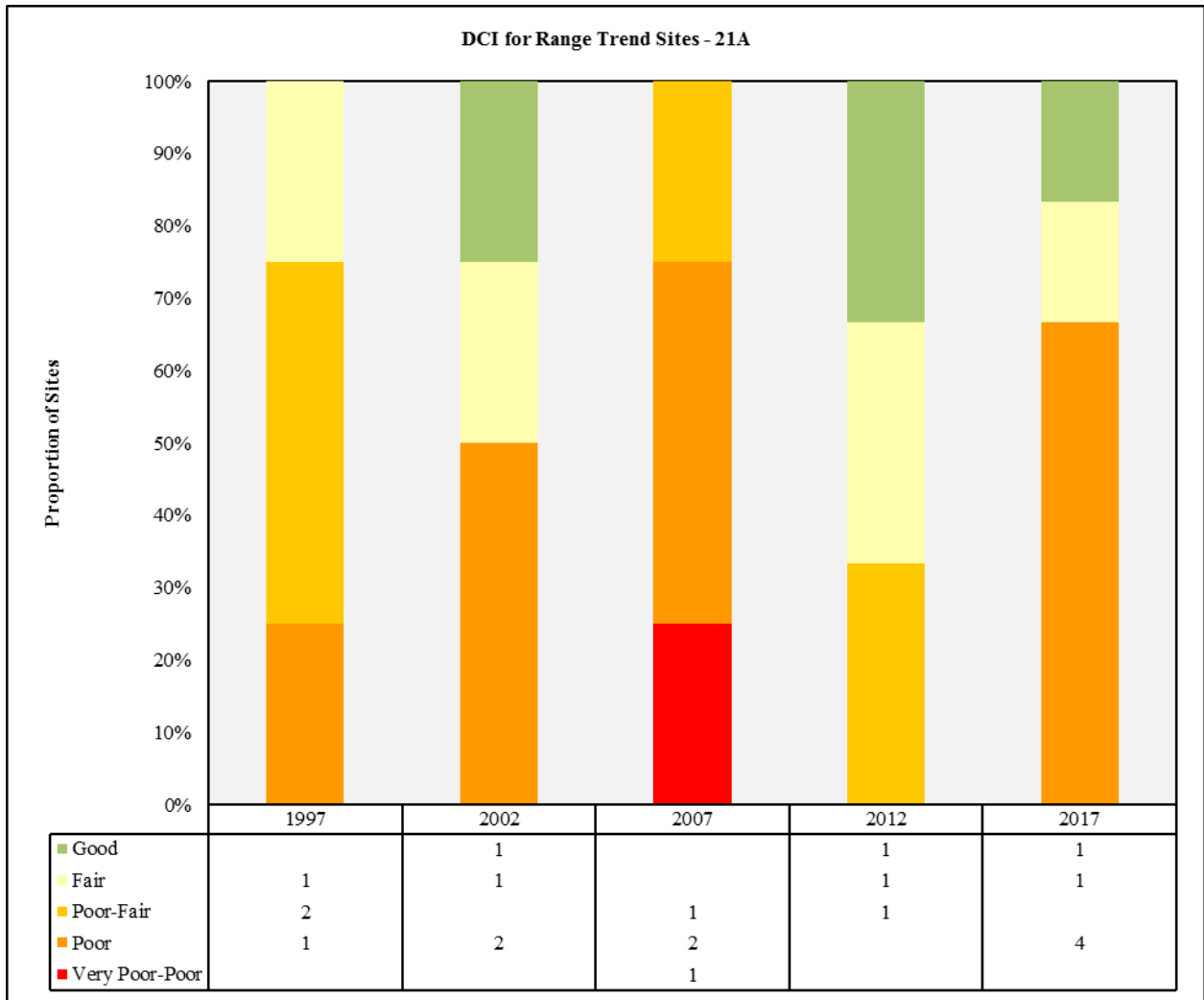


Figure 7.1: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 21A, Fillmore - Oak Creek.

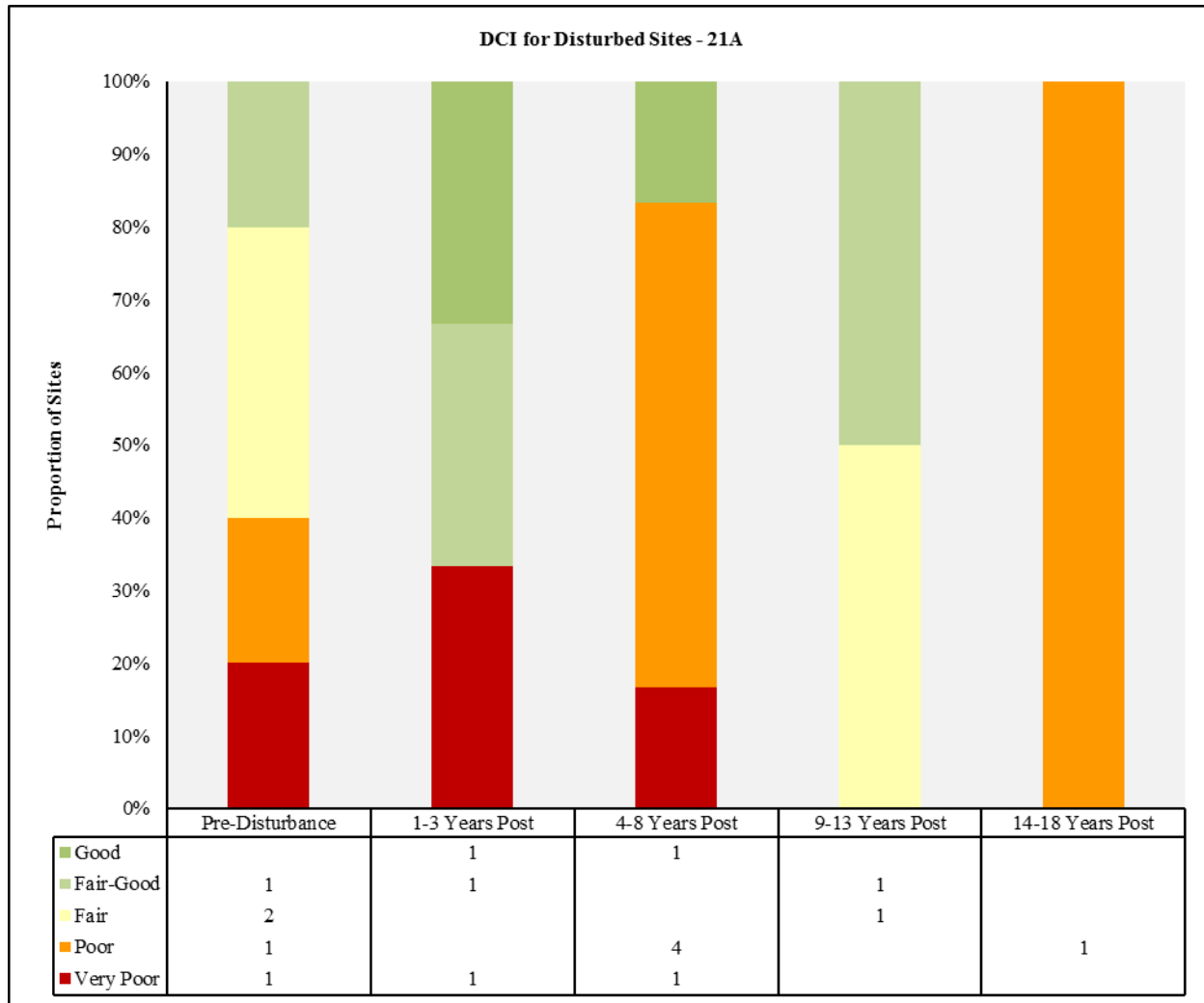


Figure 7.2: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 21A, Fillmore - Oak Creek.

Climate data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches in the Sevier Desert near Delta to 25 inches on the peaks of Blue Mountain and Partridge Mountain. All of the Range Trend and WRI monitoring studies on the unit occur within 9-22 inches of precipitation (**Map 7.1**) (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the Western, South Central and North Central Mountains divisions (Divisions 1, 3, and 4).

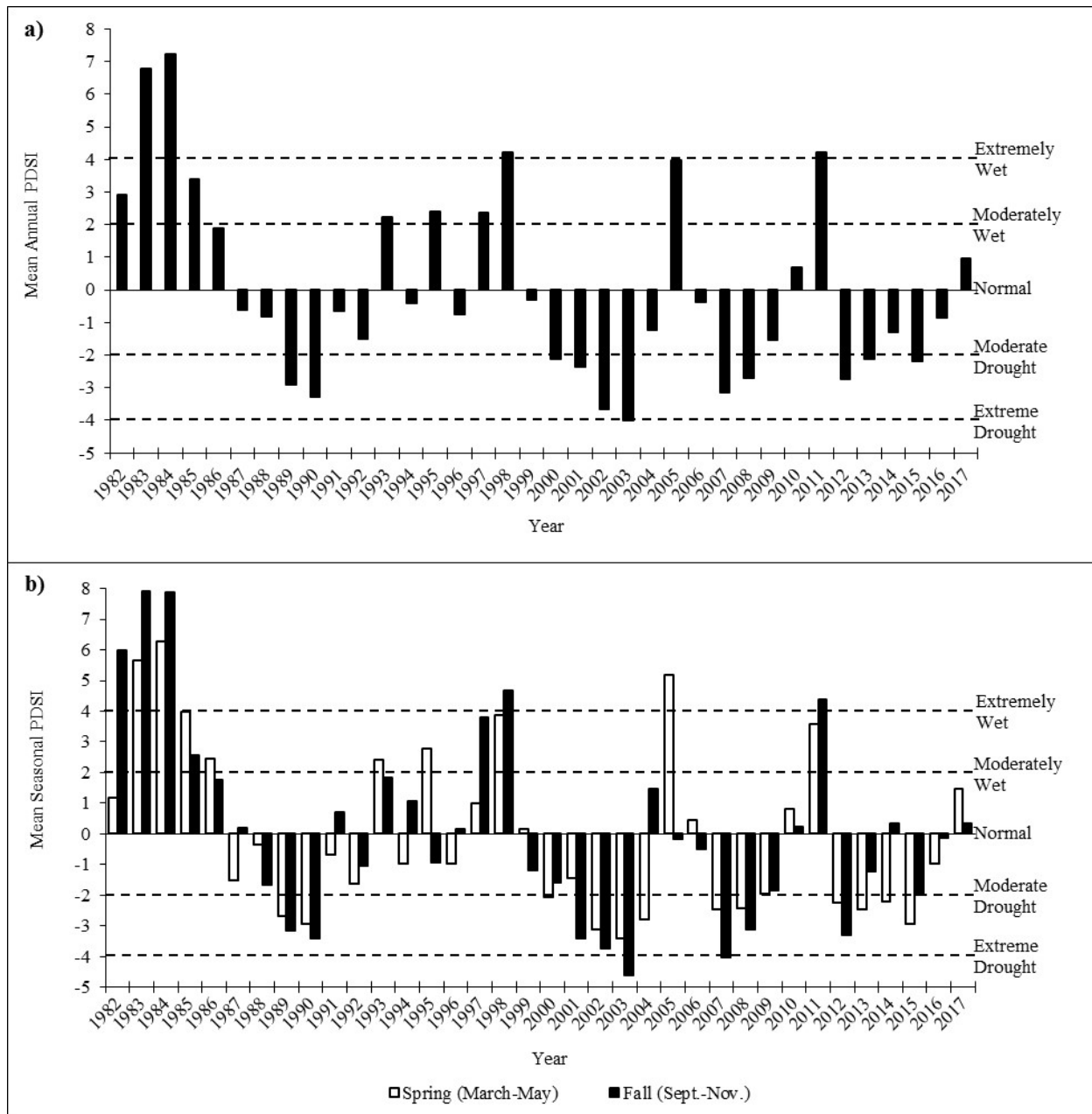
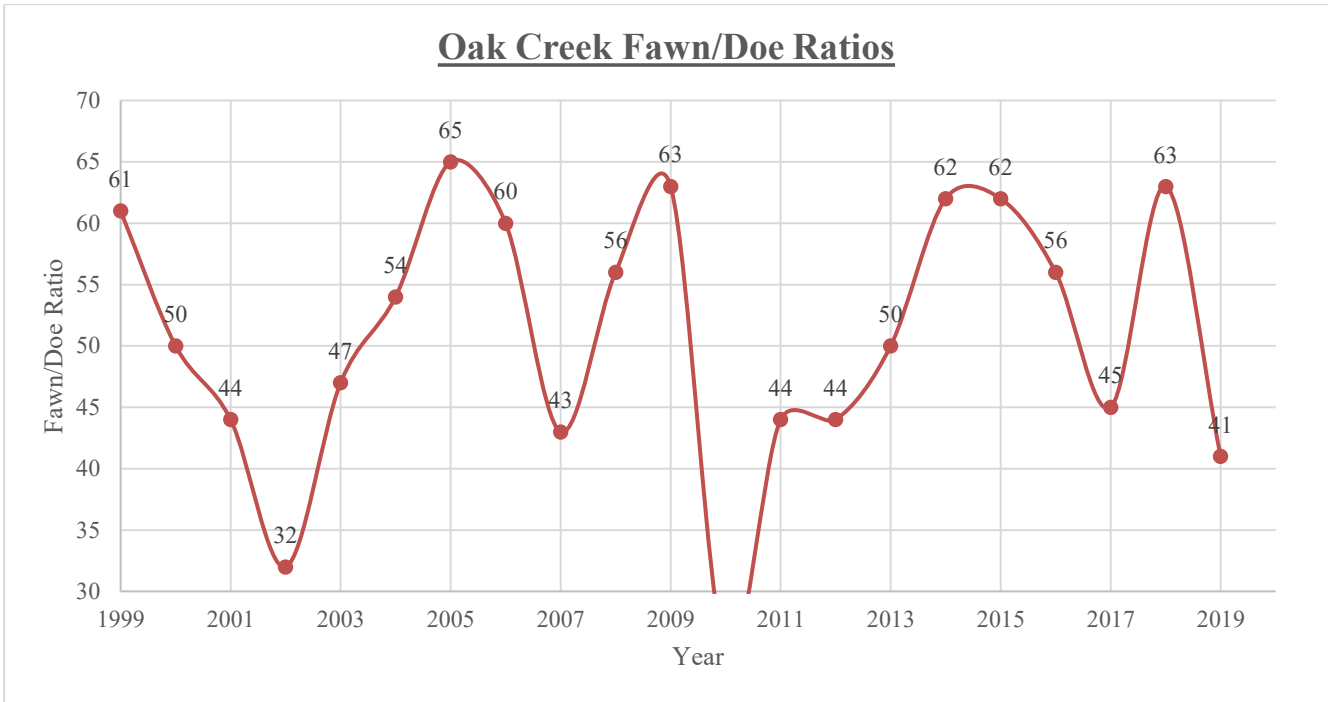
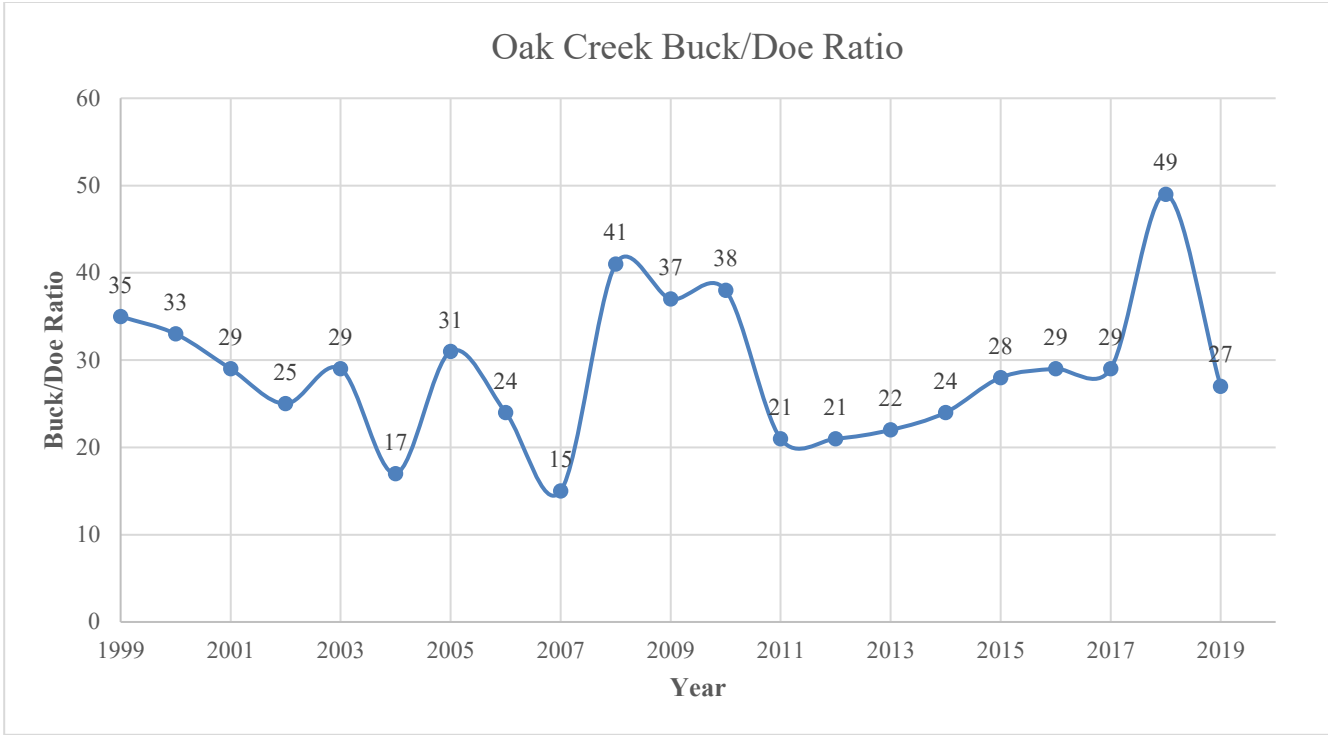


Figure 7.3: The 1982-2017 Palmer Drought Severity Index (PDSI) for the Western division (Division 1). The PDSI is based on climate data gathered from 1895 to 2017. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2018).



Works Cited
 Time Series Data. (2015). *National Oceanic and Atmospheric Administration Earth System Research Laboratory Physical Science Division*. Retrieved January 2015, from <http://www.esrl.noaa.gov/psd/data/timeseries/>

DEER HERD UNIT MANAGEMENT PLAN
Herd Unit #21B
Fillmore, Pahvant
2020

BOUNDARY DESCRIPTION

Juab, Millard and Sevier counties - Boundary begins at SR-132 and SR-125 (300 E in Leamington); west on SR-132 to US-6; south on US-6 to SR-257; south on SR-257 to the Black Rock road; east on this road to I-15; south on I-15 to I-70; east and north on I-70 to US-89; north on US-89 to US-50 in Salina; north on US-50 to I-15 near Scipio; south on I-15 to Exit 178 and US-50; south on US-50 to Whiskey Creek Road; north on this road to McCormick Road (CR-4549); north on this road to SR-125; north on SR-125 to SR-132 in Leamington. Excludes all Native American trust lands within this boundary. Excludes all CWMUs.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

OWNERSHIP	Year-Long Range		Summer Range		Winter Range	
	AREA (acres)	%	AREA (acres)	%	AREA (acres)	%
Forest Service	0	0%	325,288	85%	140,100	24%
Bureau of Land Management	2,995	1%	15,470	4%	188,601	32%
Utah State Institutional Trust Lands	17	82%	2,367	1%	34,616	6%
Native American Trust Lands	0	0%	0	0%	1,357	0%
Private	662	18%	40,623	11%	202,590	35%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	0	0%	119	0%	14977	3%
TOTALS	3,674	100%	383,867	100%	582,241	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.
- Continue to review habitat boundaries and look for ways to improve boundaries that provide for better social and biological needs on the unit.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Manage for a 5-year target population of **7,600** wintering deer (modeled number) during the five-year planning period; unless range conditions become unsuitable as evaluated by DWR. This is a decrease from the 2015 plan which was 12,000. The 10-year population estimate is 6,900. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.

Herd Composition – This is a General Season unit and will be managed to maintain a three year average postseason buck to doe ratio of **18-20** according to the statewide plan

Harvest – General season hunting will be used to maintain and work towards objectives on this unit. Hunting strategies will include using Archery, Rifle, and Muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives.

A Limited Entry muzzleloader hunt will also be offered on this unit in early November. Permits will be recommended up to 0.5% of the general-season draw permit total with a minimum of 5 permits on the unit.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size – Utilizing harvest data, postseason and mortality estimates, a computer model will be used to estimate winter population size. The 2019 model estimates the population at 6,700 deer.
- Buck Age Structure – Monitor age class structure of the buck population through the use of postseason classification, statewide harvest survey data and bag checks.
- Harvest – The primary means of monitoring harvest will be through the statewide harvest survey and the use of checking stations when needed.

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation – Strategies will be implemented to mitigate crop depredation as prescribed by state law and DWR policy.
- Habitat – The amount and condition of summer habitat on public lands, landowner acceptance and winter forage conditions will determine herd size. Excessive habitat utilization will be addressed through antlerless removal.
- Predation – If predation is determined to be a limiting factor, efforts to limit predation will be taken according to DWR predator management policy.
- Highway Mortality – DWR will cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures, warning signs, etc. if needed. Currently, highway mortality is not a limiting factor on this unit.
- Illegal Harvest – If illegal harvest is identified as a limiting factor, a unit specific action plan will be develop in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain or enhance forage production through direct range improvements on winter and summer deer range throughout the unit to achieve population management objectives.
- Maintain critical fawning habitat in good condition. Fawn recruitment is a major concern on this unit and may be the single greatest factor limiting the population.
- Work with federal and state partners in fire rehabilitation and prevention on crucial deer habitat through the WRI process

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range desirable component index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. However, the relationship between DCI and the changes in deer carrying capacity is difficult to quantify.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Coordinate with federal and state partners in designing projects that will improve fire resiliency and protect areas of crucial habitat.
- Work toward long-term habitat protection and preservation through agreements with land management agencies and local governments, the use of conservation easements, etc. on private lands and working toward blocking up UDWR properties through land exchanges with willing partners.
- Manage vehicle access on Division of Wildlife Resources land to limit disturbance critical times such as winter and fawning.
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and to provide refuges.
- Future habitat work should be concentrated on the following areas.
 - WMA's.

- Winter range along east side of unit.
- Quaking Aspen forests unit wide.

Habitat Project Summary

Type	Completed Acreage	Current Acreage	Proposed Acreage	Total Acreage
Anchor Chain	8,792	0	1,047	9,839
Ely (One-Way)	3,031	0	471	3,501
Ely (Two-Way)	5,143	0	577	5,719
Smooth (One-Way)	618	0	0	618
Bullhog	5,223	1,195	0	6,418
Full Size	488	0	0	488
Skid Steer	4,735	1,195	0	5,930
Chain Harrow	0	6,067	0	6,067
> 15 ft. (Two-Way)	0	6,067	0	6,067
Disk	72	0	0	72
Off-Set (One-Way)	72	0	0	72
Harrow	338	0	0	338
> 15 ft. (One-Way)	338	0	0	338
Herbicide Application	2,181	0	0	2,181
Aerial (Fixed-Wing)	1,793	0	0	1,793
Aerial (Helicopter)	359	0	0	359
Ground	29	0	0	29
Prescribed Fire	631	0	0	631
Road Decommissioning	62	0	0	62
Road/Parking Area Improvements	0	0	6	6
Seeding (Primary)	10,972	451	131	11,553
Broadcast (Aerial-Fixed Wing)	8,949	0	0	8,949
Broadcast (Aerial-Helicopter)	651	0	0	651
Drill (Rangeland)	1,372	0	0	1,372
Ground (Mechanical Application)	0	451	131	581
Spring Development	1	0	0	1
Vegetation Removal/Hand Crew	4,214	244	899	5,357
Lop and Scatter	3,979	0	899	4,878
Lop-Pile-Burn	235	244	0	478
Total Treatment Acres	32,484	7,956	2,083	42,524
*Total Land Area Treated	28,525	7,518	2,083	38,126

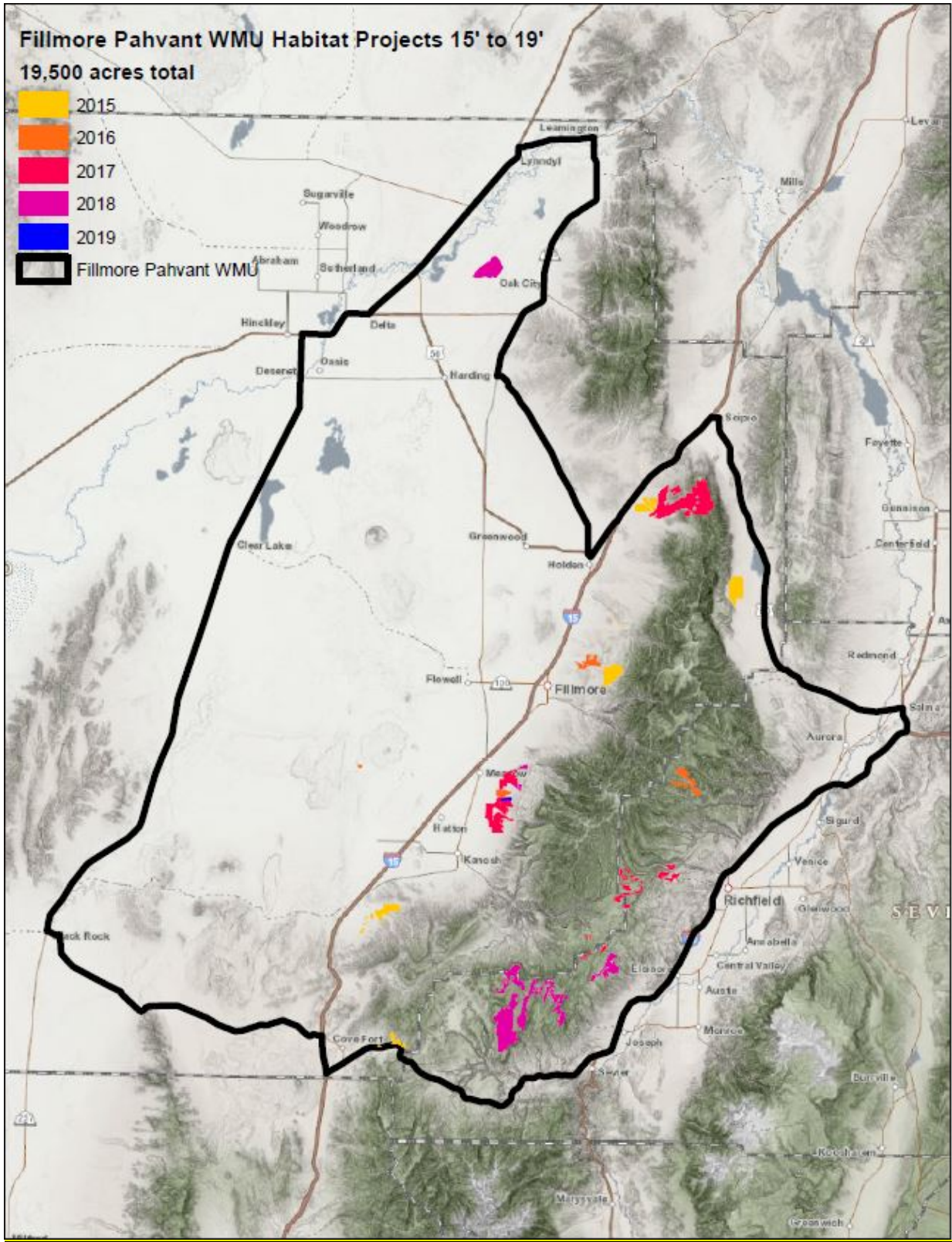
Table 8.1: WRI treatment action size (acres) for completed, current, and proposed projects for WMU 21B, Fillmore – Pahvant. Data accessed on 02/09/2018. *Does not include overlapping treatments.

Fillmore Pahvant WMU Habitat Projects 15' to 19'

19,500 acres total

- 2015
- 2016
- 2017
- 2018
- 2019

Fillmore Pahvant WMU



RANGE TREND SUMMARIES

Units 21, Fillmore Pahvant units

DWR Winter Range Trend Assessment

The condition of deer winter range within the Fillmore - Pahvant management unit has continually changed on the sites sampled since 1998. The active Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2017 sample year (**Figure 8.10**). M Hill has remained in good condition. Smith's Ridge improved from fair to fair-good. Wide Canyon DWR and Dog Valley Creek are considered to be in fair condition, and Fillmore Cemetery East went from fair to poor-fair condition. Wide Canyon BLM remained in poor condition. Walker Creek deteriorated from fair to very poor-poor condition. Bennett Field moved from poor-fair to very poor-poor condition. Meadow Creek went from poor to very poor condition. Finally Dog Valley and Dameron Canyon remained in very poor condition. (**Figure 8.11**) The treated sites have generally shown an improvement or have remained in the same condition as time since treatment increased. The exception to this is Water Canyon, which moved from fair to very poor.

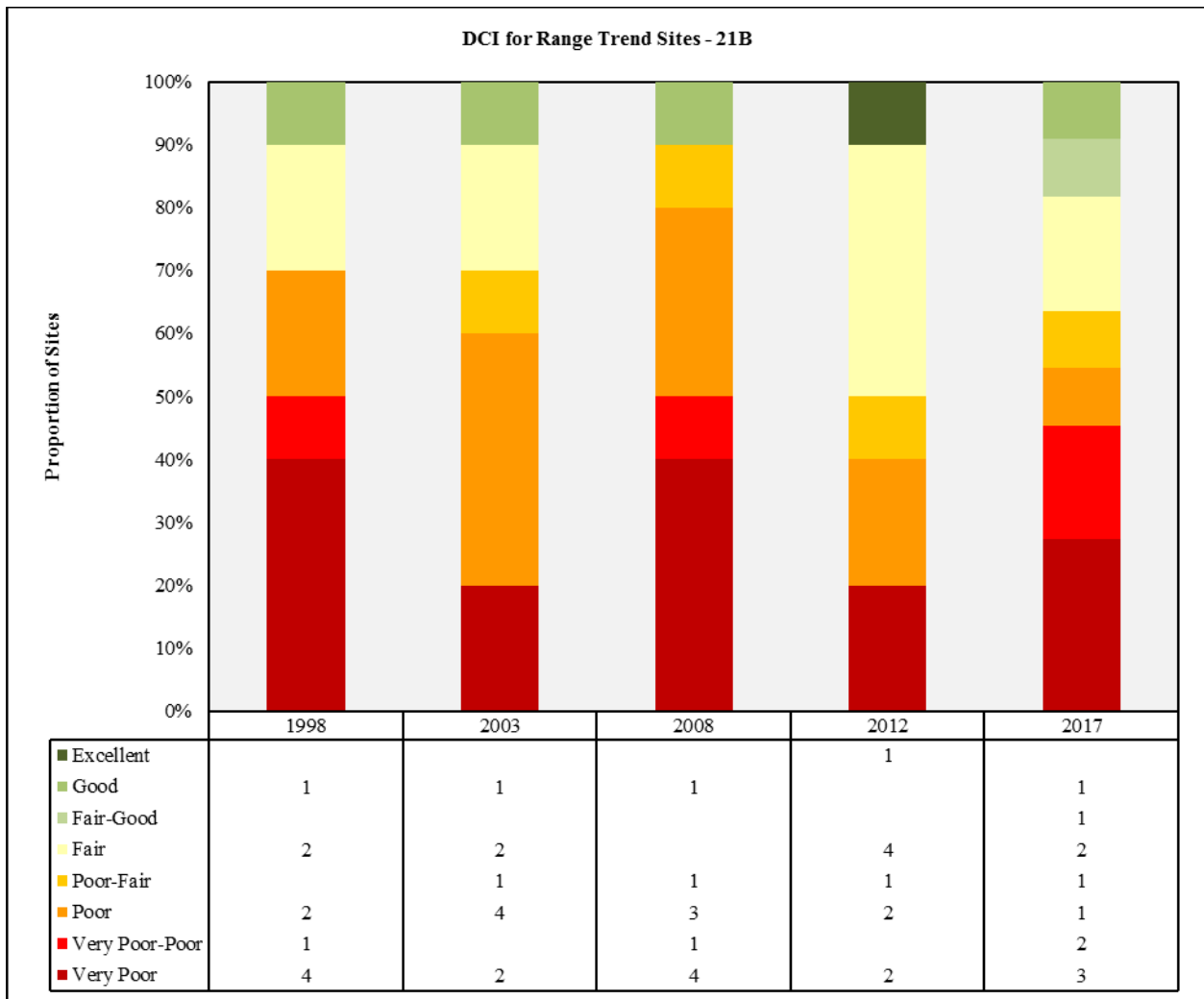


Figure 8.1: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 21B, Fillmore - Pahvant.

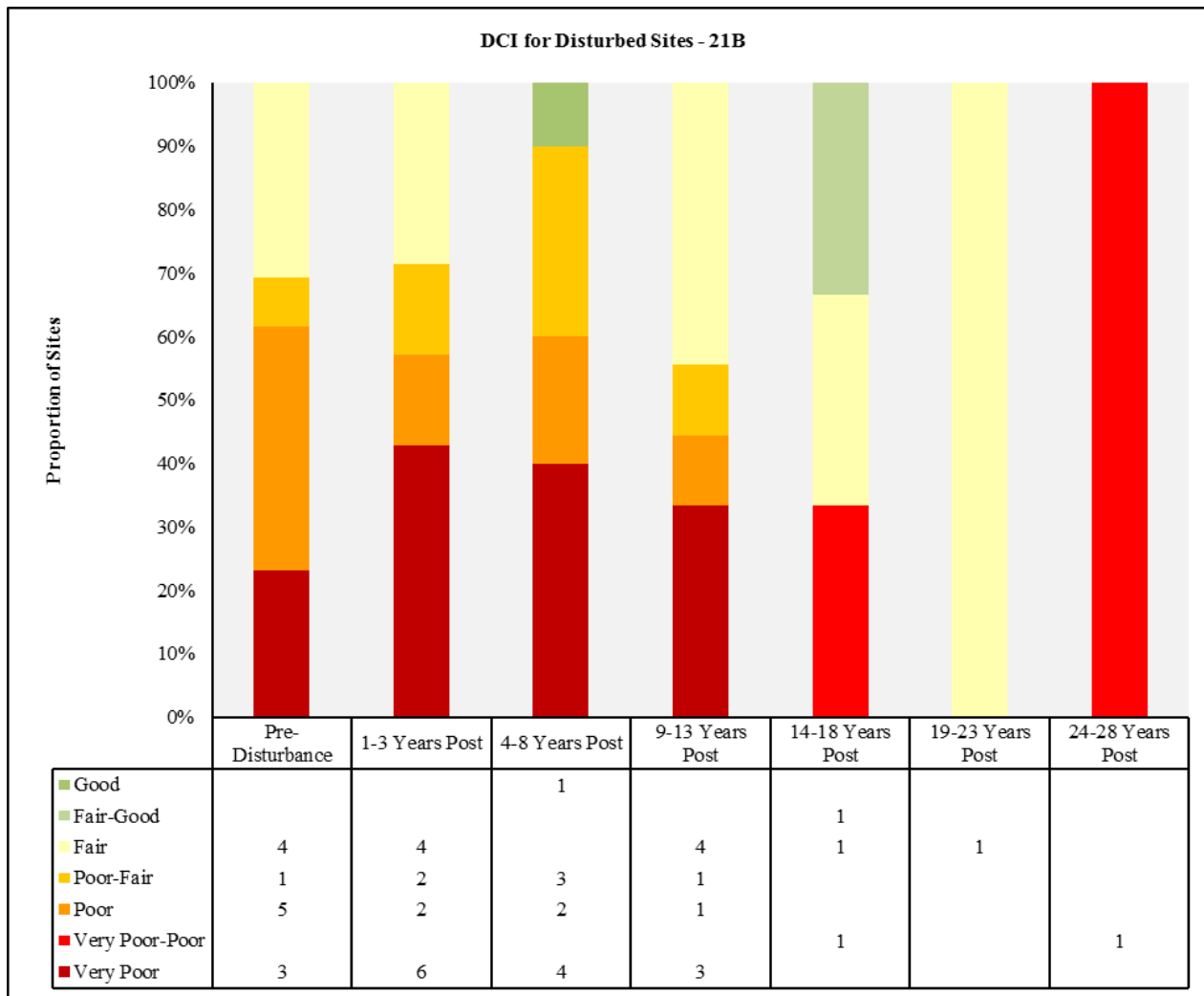


Figure 8.2: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 21B, Fillmore - Pahvant.

Mule Deer Habitat

There are 480,510 acres estimated as mule deer range on Unit 21B with 44% designated as winter range and 56% classified as summer range. The United States Forest Service manages 51% of the winter range, 30% is privately owned, 10% is managed by the Bureau of Land Management, The Utah Division of Wildlife Resources (UDWR) manages 7%, the Utah School and Institutional Trust Lands Administration (SITLA) manages another 2%, Utah Department of Transportation (UDOT) and Utah State Parks (USP) manage <1%, and there is another <1% that is tribally owned. This unit has significant amounts of winter range that are privately owned, which can present management issues with crop depredation.

Deer winter range roughly follows the base of the Pahvant range at elevations between approximately 5100 and 7500 feet. It is bordered on the west by I-15, on the east by I-70, and on the north by US-50. There are still good amounts of winter habitat at the lower elevations of the unit. The Milford Flat fire

burned significant areas of former winter range and I-15 acts as a barrier to migration into previously-used desert wintering areas.

Much of the winter range on this unit is host to shrub communities composed of a mix of Stansbury cliffrose, mountain big sagebrush, and other browse species. While many of the range trend sites show good populations of browse species, many of these sites have depleted understories with both cheatgrass and bulbous bluegrass being very common across the range. On the higher elevation summer sites, there are significant amounts of aspen-timber and subalpine meadow plant communities that are used for summer range.

Precipitation

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches in areas near Joseph up to 35 inches on the top of the Pahvant range. All of the Range Trend and WRI monitoring studies on the unit occur within 13-35 inches of precipitation (**Map 8.1**) (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South-Central division (Division 4).

The mean annual PDSI of the South-Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2014. The mean annual PDSI displayed moderately to extremely wet years from 1983-1985, 1997-1998, 2005, and 2011 (Figure 8.1a). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 2000, 2002-2004, 2007-2008, and 2012-2015; moderately to extremely wet years were displayed in 1983-1986, 1993, 1995, 1998, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009, and 2012; moderately to extremely wet years were displayed in 1982-1985, 1997-1998, 2005, and 2011 (**Figure 8.1b**).

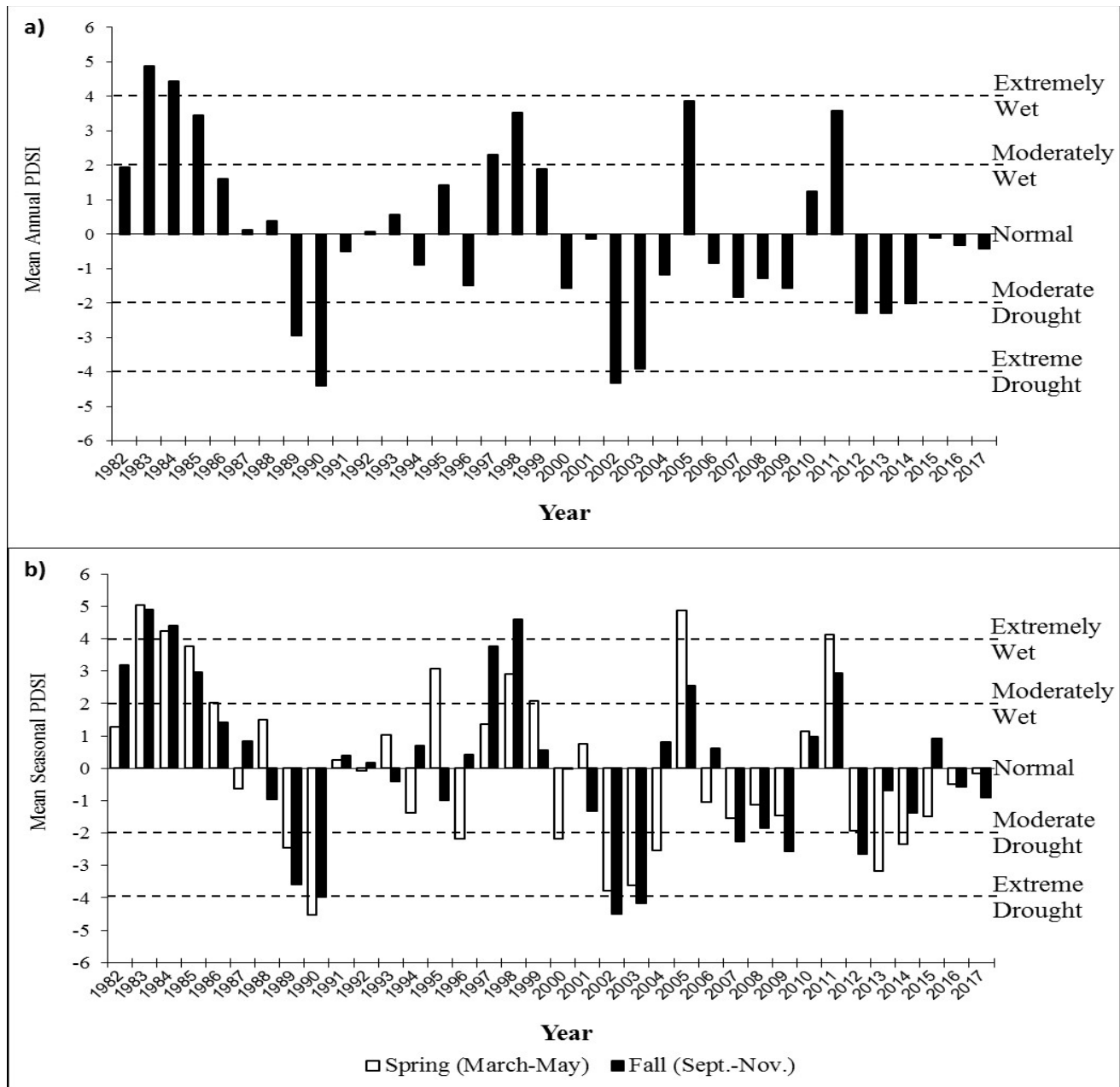
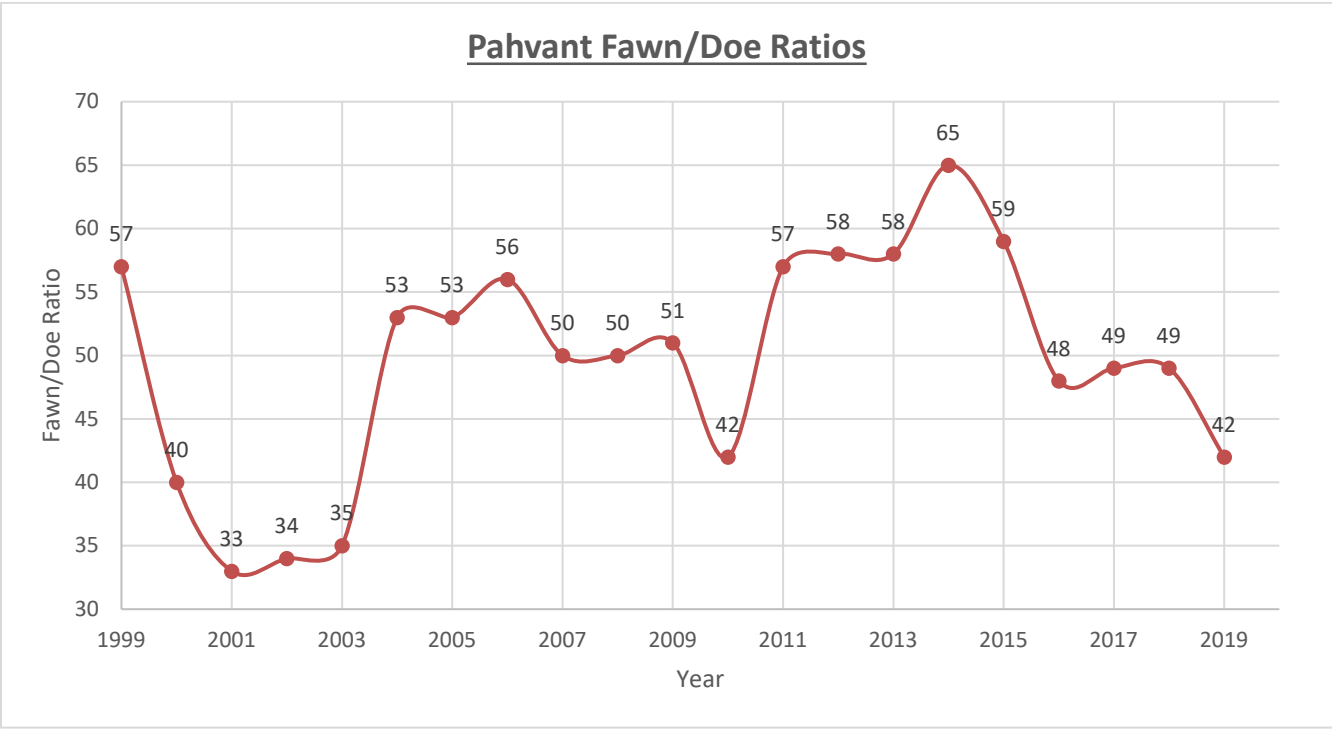
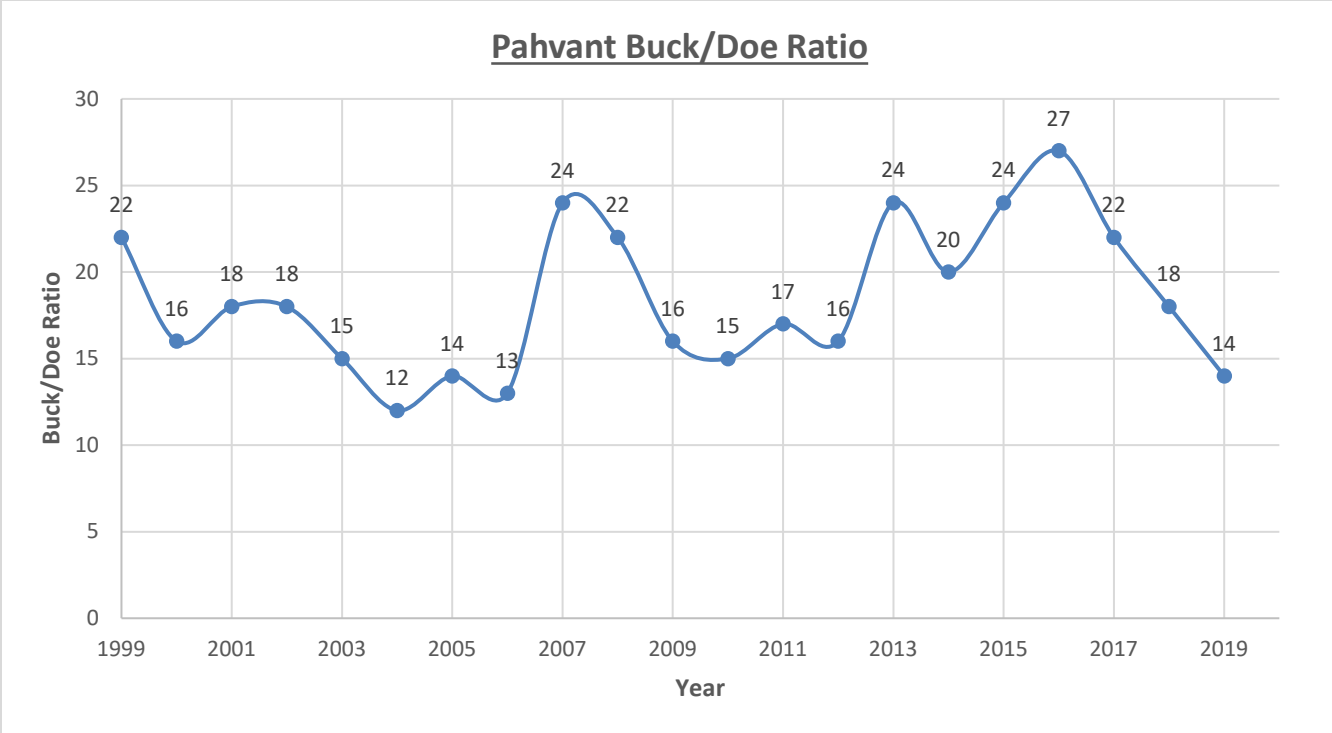


Figure 8.3: The 1982-2017 Palmer Drought Severity Index (PDSI) for the South Central division (Division 5). The PDSI is based on climate data gathered from 1895 to 2017. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2018).



Works Cited

Time Series Data. (2015). *National Oceanic and Atmospheric Administration Earth System Research Laboratory Physical Science Division*. Retrieved January 2015, from <http://www.esrl.noaa.gov/psd/data/timeseries/>

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 22
Beaver
2020

BOUNDARY DESCRIPTION

Iron, Garfield, Piute, Beaver and Millard Counties: Boundary begins at SR-130 and I-15; north on SR-130 to SR-21; north on SR-21 to SR-257; north on SR-257 to the Black Rock road; east of the Black Rock road to I-15; south of I-15 to I-70; east on I-70 to US-89; south on US-89 to SR- 20; west on SR-20 to I-15; south on I-15 to SR-130.

LAND OWNERSHIP

Ownership	Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%
Forest Service	213,318	70%	83,337	14%
Bureau of Land Management	65,991	22%	396,598	68%
Utah State Institutional Trust Lands	7,386	2%	44,367	8%
Native American Trust Lands	0	0%	205	<1%
Private	18,436	6%	53,769	9%
Department of Defense	0	0%	0	0%
USFWS Refuge	0	0%	0	0%
National Parks	0	0%	0	0%
Utah State Parks	0	0%	0	0%
Utah Division of Wildlife Resources	0	0%	2,288	2%
Total	305,201	100%	580,564	100%

RANGE AREA AND APPROXIMATE OWNERSHIP

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Manage for a 5-year target population of **14,000** wintering deer (modeled number) during the five-year planning period; unless range conditions become unsuitable as evaluated by DWR. This is an increase from the 2015 plan which was 13,000. The 10-year average population estimate is 13,200. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.

Herd Composition – This is a General Season unit and will be managed to maintain a three year average postseason buck to doe ratio of **18-20** according to the statewide plan.

Harvest – General season hunting will be used to maintain and work towards objectives on this unit. Hunting strategies will include using Archery, Rifle, and Muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason classification and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 model estimates the population at 12,000 deer.
- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, statewide harvest survey data and bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide harvest survey and the use of checking stations.

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation – Strategies will be implemented to mitigate crop depredation as prescribed by state law and DWR policy.
- Habitat – The amount and condition of summer habitat on public lands, landowner acceptance and winter forage conditions will determine herd size. Excessive habitat utilization will be addressed through antlerless removal. The Southwest Desert is a summer range limited unit. Winter range is abundant. Fawn recruitment is a major concern on this unit and may be the single greatest factor limiting the population
- Predation - If predation is determined to be a limiting factor, efforts to limit predation will be taken according to DWR predator management policy.
- Highway Mortality – DWR will cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures and warning signs etc if needed.
- Illegal Harvest - If illegal harvest is identified as a limiting factor, a unit specific action plan will be develop in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain or enhance forage production through direct range improvements on winter and summer deer range throughout the unit to achieve population management objectives.
- Maintain critical fawning habitat in good condition. Fawn recruitment is a major concern on this unit and may be the single greatest factor limiting the population.
- Work with federal and state partners in fire rehabilitation and prevention on crucial deer habitat through the WRI process

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range desirable component index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. However, the relationship between DCI and the changes in deer carrying capacity is difficult to quantify.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Coordinate with federal and state partners in designing projects that will improve fire resiliency and protect areas of crucial habitat.
- Work toward long-term habitat protection and preservation through agreements with land management agencies and local governments, the use of conservation easements, etc. on private lands and working toward blocking up UDWR properties through land exchanges with willing partners.
- Manage vehicle access on Division of Wildlife Resources land to limit disturbance critical times such as winter and fawning.
- Manage riparian areas in critical fawning habitat to provide water, cover and succulent forage from mid-to late summer.
- Work with BLM to support wild horse removals where there are conflicts with Mule Deer.
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and reseed areas dominated by cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects.
- Seek opportunities to increase browse in burned areas of critical winter range.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and to provide refuges.
- Seek out opportunities to improve the limited summer range across the unit. Develop summer range habitat improvement projects that remove encroaching trees, improves succulent vegetation and wet meadows, increases aspen recruitment, enhances and/or protects riparian areas, and use prescribed fire to promote early succession habitats where appropriate.

- Future habitat work should be concentrated on the following areas.
 - Seek opportunities to increase browse in burned areas of critical winter range.
 - Continue to reduce Pinyon and Juniper encroaching into shrubland in critical winter range. Specifically moving north from Beaver toward I-70 and along the east side of the Tushar slopes in critical winter range.
 - West of I-15 seek opportunities to improve riparian vegetation in fawning habitat to furnish water, cover, and late to mid-summer succulent forage.
 - Quaking Aspen forests unit wide.

Habitat Project Summary

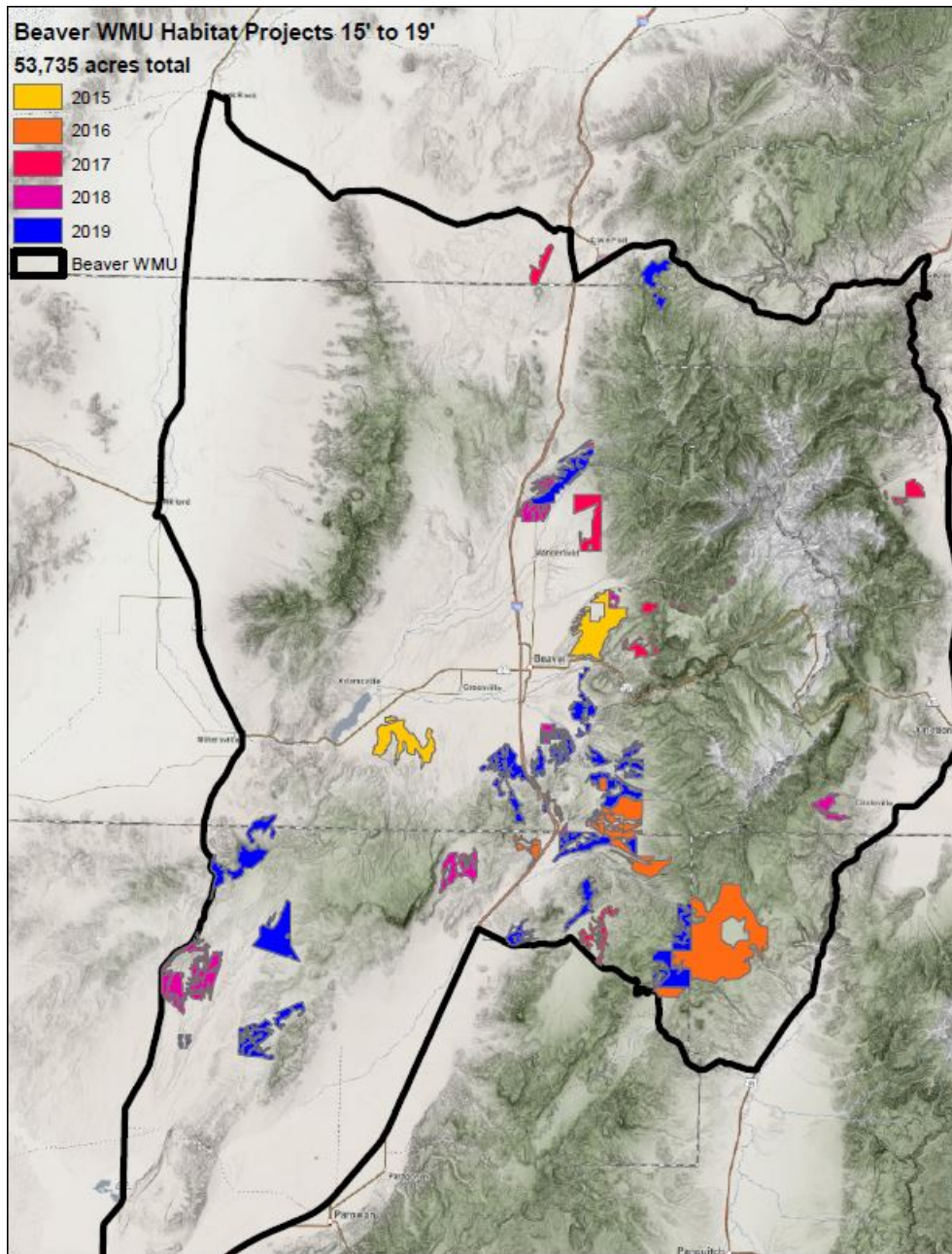
There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 204,704 acres of land have been treated within the Beaver unit since the WRI was implemented in 2004 (Map 1.8). An additional 9,471 acres are pending completion, 15,217 acres are currently being treated, and treatments have been proposed for 25,438 acres. Treatments frequently overlap one another bringing the total completed treatment acres to 254,829 acres for this unit (Table 1.7). Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Seeding plants to augment the herbaceous understory is the most common management practice in this unit. Anchor chaining to remove pinyon and juniper is also frequently used. Other management practices include (but are not limited to): bullhog treatments to treat pinyon and juniper, prescribed fire, hand crews to remove pinyon and juniper, harrow, and other similar vegetation removal techniques (Table 1.7).

Type	Completed Acreage	Current Acreage	Pending Completed Acreage	Proposed Acreage	Total Acreage
Anchor Chain	119,760	2,523	0	2,751	125,034
Ely (One-Way)	109,199	2,523	0	0	111,722
Ely (Two-Way)	9,822	0	0	2,751	12,573
Smooth (One-Way)	740	0	0	0	740
Bullhog	12,423	3,697	0	464	16,584
Full Size	12,038	3,697	0	464	16,199
Skid Steer	385	0	0	0	385
Bulldozing	36	0	0	0	36
Tree Push	36	0	0	0	36
Chain Harrow	514	1,091	0	0	1,605
≤15 ft. (Two-Way)	93	1,091	0	0	1,184
>15 ft. (One-Way)	307	0	0	0	307
>15 ft. (Two-Way)	114	0	0	0	114
Disc	158	0	0	0	158
Off-Set (Two-Way)	158	0	0	0	158
Harrow	4,380	0	0	69	4,449
≤15 ft. (One-Way)	75	0	0	0	75
≤15 ft. (Two-Way)	2,269	0	0	69	2,337
>15 ft. (One-Way)	1,646	0	0	0	1,646
>15 ft. (Two-Way)	391	0	0	0	391
Herbicide Application	1,481	0	0	0	1,481
Aerial (Fixed-Wing)	1,481	0	0	0	1,481
Planting/Transplanting	1,057	0	0	0	1,057
Prescribed Fire	0	0	9,471	79	9,550
Seeding (Primary)	168,983	1,364	0	969	171,316
Broadcast (Aerial-Fixed Wing)	121,807	1,364	0	969	124,140
Drill (Rangeland)	46,016	0	0	0	46,016
Drill (Truax)	1,068	0	0	0	1,068
Ground (Mechanical Application)	92	0	0	0	92
Seeding (Secondary/Shrub)	0	0	0	262	262
Hand Seeding	0	0	0	262	262
Skid-Steer Mounted Tree Cutter	1,750	0	0	0	1,750

Hydraulic Brush Saw	1,750	0	0	0	1,750
Vegetation Removal/Hand Crew	25,917	7,758	0	24,868	58,543
Lop (No Scatter)	5,074	0	0	0	5,074
Lop & Scatter	20,838	7,758	0	24,868	53,464
Lop-Pile-Burn	5	0	0	0	5
Other	852	0	0	0	852
Road Decommissioning	852	0	0	0	852
Grand Total	337,311	16,433	9,471	29,463	392,678
* Total Land Area Treated	204,704	15,217	9,471	25,438	254,829

Table 1.1: WRI treatment action size (acres) for completed, current, and proposed projects for WMU 22, Beaver. Data accessed on 02/18/2019. *Does not include overlapping treatments.



Big Game Habitat

There are an estimated 883,573 acres classified as deer range on Unit 22 with 34% classified as summer range and 66% considered to be winter range (Table 1.1, Map 1.2).

Land managed by the Bureau of Land Management comprises 68% of the winter range, 14% is administered by the United States Forest Service (USFS), 10% is privately owned, 7% is managed by the Utah School and Institutional Trust Lands Administration (SITLA), and less than 1% each is tribally owned or managed by the Utah Department of Transportation (UDOT), Utah State Parks (USP), or Utah Division of Wildlife Resources (UDWR) (Table 1.2, Map 1.2, Map 1.6). Of the elk winter range, 51% is administered by the BLM, 34% by the USFS, 8% is privately owned, 6% is managed by SITLA, 1% is administered by UDWR, and less than 1% is tribally owned (Table 1.3, Map 1.3, Map 1.6).

The Black and Mineral Mountains lack good summer range, but have vegetation similar to most deer wintering areas of southern Utah. Both the Black and Mineral Mountains have relatively steep, rugged slopes with areas of rocky outcrops. However, the Black Mountains are unlike the Mineral Mountains in that the top is dominated by gently rolling sagebrush hills and dry meadows.

The Tushar Mountains are more typical of the high elevation mountains of central and southern Utah and contain good summer range for deer and elk. The Tushars have many small lakes and perennial streams. The western slopes of the Tushar Mountains are more gradual and receive sufficient precipitation to create substantial summer range for deer. On the east side of the Tushar Mountains, the normal winter range boundaries range from 6,200 feet on the valley floor to 8,500 feet in the upper basins. Oak Basin often winters deer up to the 8,600-foot level. The upper limit along the steeper portions of the east face of Tushar Mountains is 7,200 feet. Winter deer concentrations are found on south and southeast facing slopes. Minor migrations from the summer ranges of units 23 - Monroe and 24 - Mt. Dutton onto unit 22 winter ranges occur each year, but the major movement is an elevation movement from summer to winter range within the unit.

PERMANENT RANGE TREND SUMMARIES

The condition of deer winter range within the Beaver management unit has continually changed on the sites sampled since 1998; the active Range Tend sites within the unit are considered to be in very-poor to good condition as of the 2018 sample year (**Figure 1.10, Figure 1.10**). The sites considered to be in good condition are Deer Flat, Rocks Reseeding, and South Creek: high amounts of preferred browse and significant perennial grass cover contribute to the high rankings of these sites. The Marysvale WMA and Piute Reservoir site is considered to be in fair-good and fair condition, and the Beaver Table study is classified as being in poor-fair condition. The Wades Canyon and Minersville Reservoir studies were classified as being in poor condition. The Sheep Rock, B Hill, and Above Fremont Wash study sites are considered to be in very poor to poor condition. Finally, the sites considered to be in very poor condition are Bone Hollow, Big Cedar Cove, and Antelope Mountain. The lack of preferred browse and high annual grass cover are primary reasons that these sites were categorized as being in very poor condition.

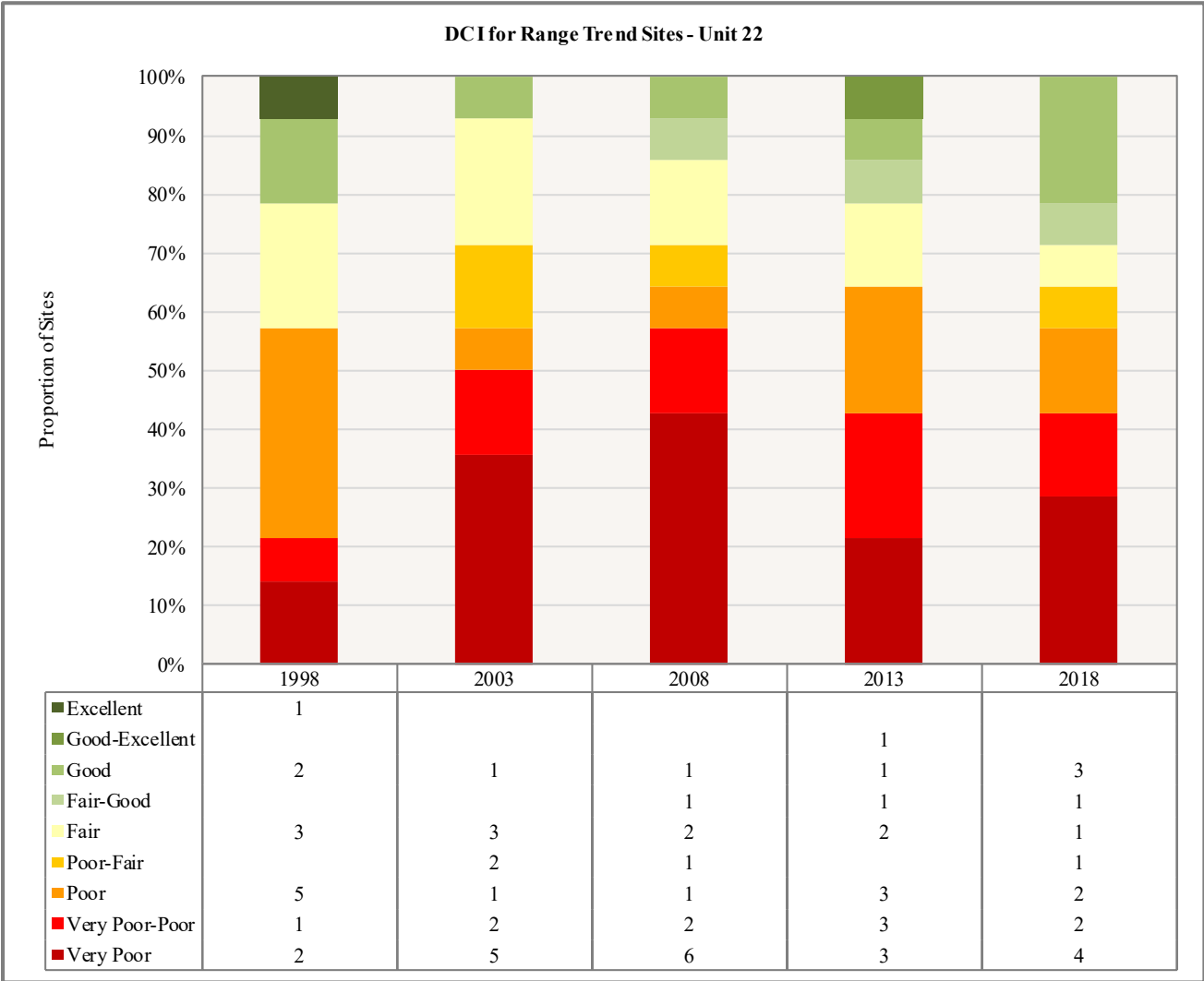


Figure 1.1: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 22, Beaver.

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches near Marysville to 43 inches on Mount Baldy. All of the Range Trend and WRI monitoring studies on the unit occur between 9 and 22 inches of precipitation (Map 1.1) (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4).

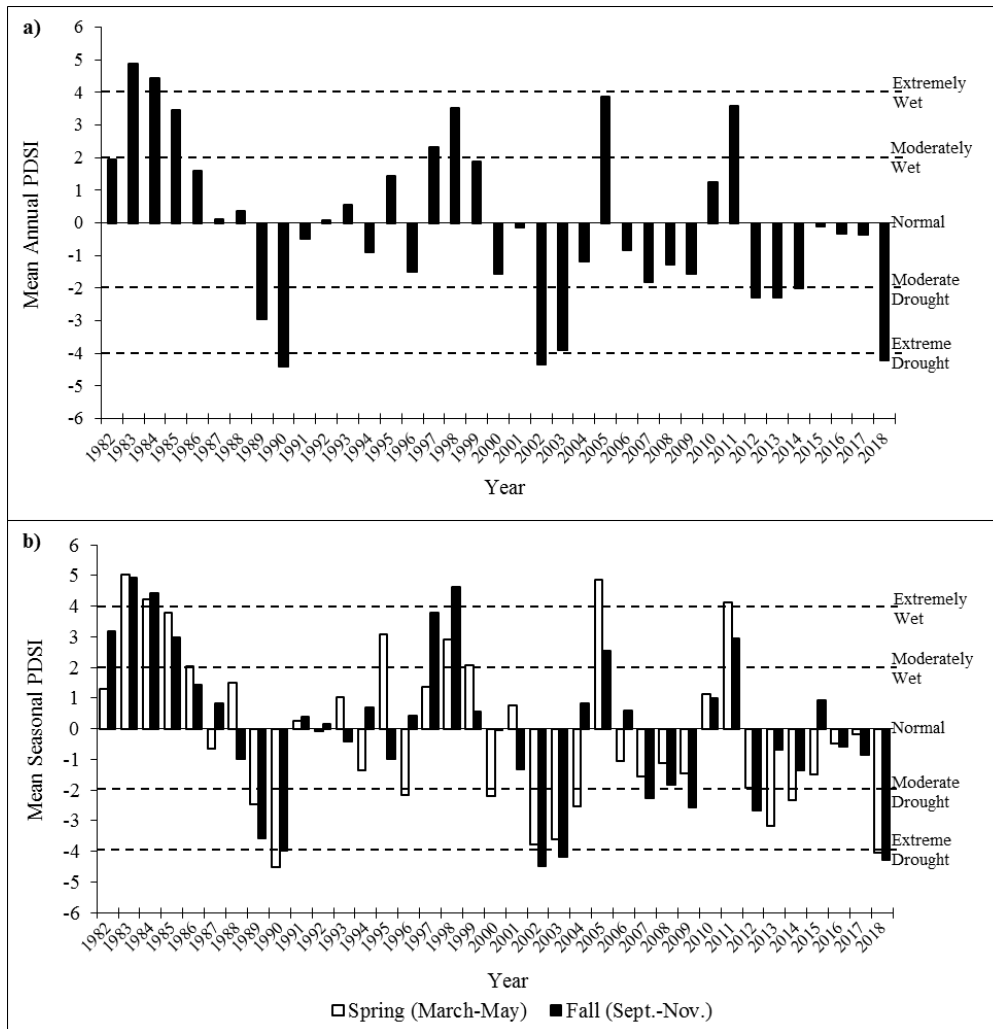
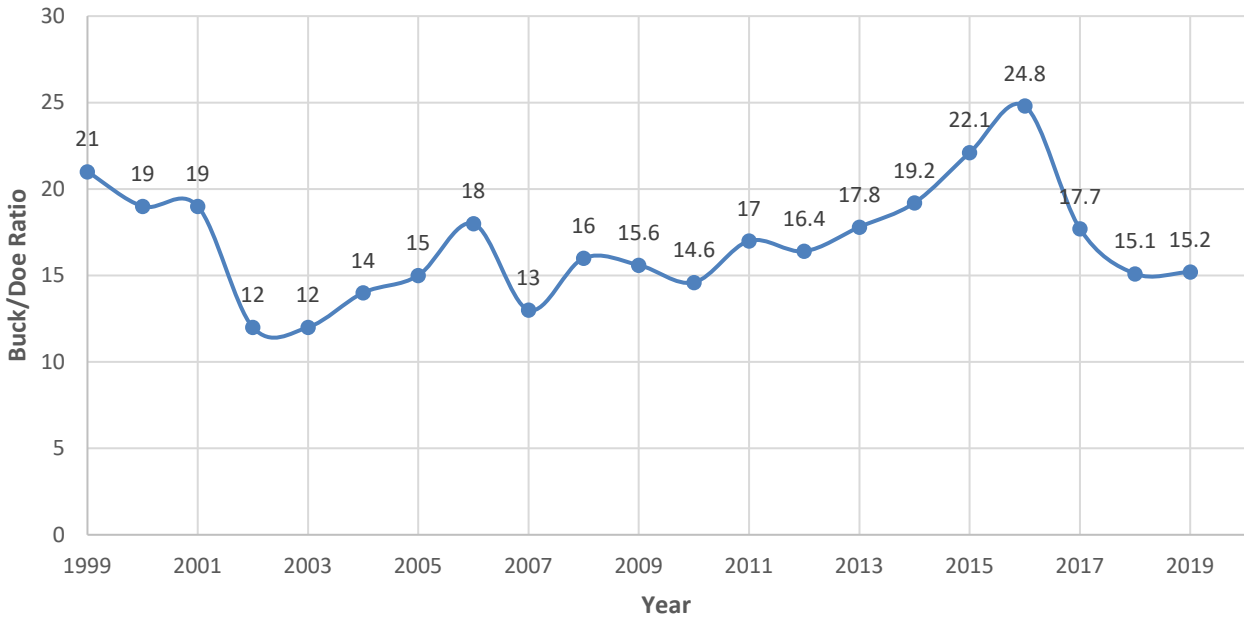
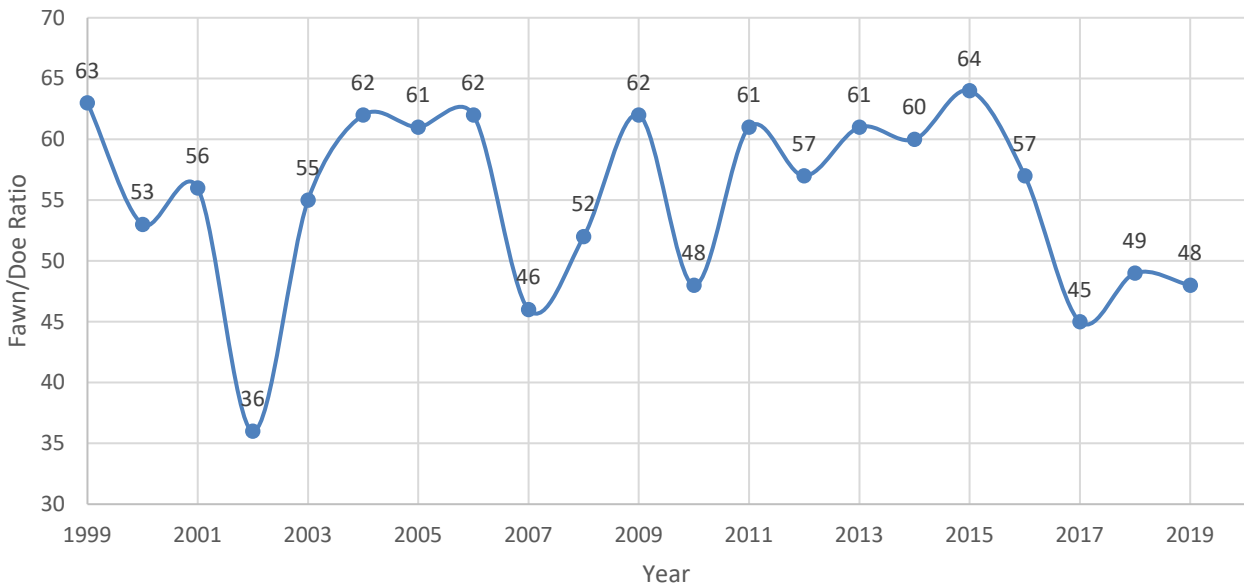


Figure 1.2: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).

Beaver Buck/Doe Ratio



Beaver Fawn/Doe Ratios



DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit #23
Monroe
2020

BOUNDARY DESCRIPTION

Piute and Sevier counties - Boundary begins at I-70 and US-89 north of Sigurd; south on US-89 to SR-24; south on SR-24 to SR-62; south and west on SR-62 to US-89; north on US-89 to I-70 near Sevier; north on I-70 to US-89 north of Sigurd.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Year-long range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0		112284	75%	43465	24%
Bureau of Land Management	0		8724	6%	99873	56%
Utah State Institutional Trust Lands	0		9942	7%	15034	9%
Native American Trust Lands	0		0	0%	640	0%
Private	0		18382	12%	15283	9%
Department of Defense	0		0	0%	0	0%
USFWS Refuge	0		0	0%	0	0%
National Parks	0		0	0%	0	0%
Utah State Parks	0		0	0%	0	0%
Utah Division of Wildlife Resources	0		0	0%	3753	2%
TOTAL	0		149332	100%	178048	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts with human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- Target Winter Herd Size - Achieve a target population size of 7,000 wintering deer (modeled number). Permit the population to exceed the objective only if habitat and depredation conditions allow. This is a decrease from the 2015 plan, which was 7,500. Monitoring of this herd has shown that when the population nears 7,500 animals that herd productivity, fawn/doe ratios, adult body condition, and survival decline. This indicates that to have a thriving and productive herd that we should manage for slightly fewer deer.
- Herd Composition – Maintain a unit three-year average postseason buck to doe ratio in accordance with the statewide plan. Currently this unit is being managed for an 18-20 buck/doe ratio and it is recommended be continue managing for that objective. Recent public input shows that the public prefers managing this unit for an 18-20 buck/doe ratio vs a 15-17 ratio.

	Objective from past plan (2015)	Long-term Objective	2021-2025 Objective	Change
Monroe	7,500	7,500	7,000	-7%

POPULATION MANAGEMENT STRATEGIES

Year	Buck Permits	Buck harvest	*Antlerless Harvest	Post-Season F/100 doe	Post-Season B/100 doe	**Post-Season Population Estimate	Objective
2010	1,500	252	150	38	12	5,600	7,500
2011	1,400	432	97	66	14	5,200	7,500
2012	1,000	519	81	69	18	6,800	7,500
2013	1,200	630	117	70	23	7,800	7,500
2014	1,400	711	219	66	22	7,200	7,500
2015	1,500	743	247	64	22	6,900	7,500
2016	1,550	793	282	50	19	6,700	7,500
2017	1,550	760	343	51.5	13.6	6,000	7,500
2018	1,200	592	134	51.5	17.4	6,300	7,500
2019	1,100	427	80	43.1	16.8	5,400	7,500
2020	900						
10 yr Avg	1,300	586	175	56.9	17.8	6,390	

*Antlerless harvest targets deer living on agricultural ground year-round.

**Population estimates are modeled population estimates.

Monitoring

- **Population Size** - Herd composition and population size will be monitored through post season and spring classification, hunter check stations, harvest surveys computer modeling and radio collar survival studies. The 2019 model estimates the population at 5,400 deer wintering deer with a decreasing trend. Monitor adult doe and fawn survival through radio collar research studies on the unit. Use survival estimates gained from this research on surrounding units.
- **Buck Age Structure** - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- **Harvest** - The primary means of monitoring harvest will be through the statewide uniform harvest survey. Achieve the target population size by use of antlerless harvest using a variety of harvest methods and seasons. Recognize that buck harvest will be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck: doe ratios.

Limiting Factors (May prevent achieving management objectives)

- **Crop Depredation** - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy. Closely monitor Sevier Valley and Grass Valley agricultural areas. Work with landowners to increase tolerance for deer. Where necessary antlerless deer removal may be used to control damage to agricultural crops.
- **Habitat** – Habitat is often the driving force in a deer population. Habitat will be monitored for excessive use by deer. If needed to protect critical range, removal of antlerless deer through localized hunts may be implemented. Excessive habitat utilization will be addressed. Please see detailed habitat section of this plan.
- **Predation** - Follow DWR predator management policy.
 - Assess need for control by species, geographic area and season of year.
 - Seek assistance from USDA/Wildlife Services when deer populations are depressed and where there is a reasonable chance of gaining some relief through a predator control effort. Concentrate USDA/Wildlife Services control efforts during and immediately prior to the fawning period.
 - Recommend cougar harvest to benefit deer while maintaining the cougar as a valued resource in its own right. In 2019 cougar hunting permits were significantly increased to address significant predation the deer herd.
- **Highway Mortality** - Cooperate with the Utah Department of Transportation in construction of highway fences, passage structures and warning signs, etc. Specifically, explore ways to reduce deer/vehicle collisions on Highway 24, north of Koosharem reservoir (deer proof fencing, guzzlers etc.).
- **Illegal Harvest** - Specific preventive measures will be implemented through Action Plans developed in cooperation with the Law Enforcement section should illegal kill become an identified and significant source of mortality.
- **Interspecific competition** - No limitation generated by elk/deer interactions has been documented.

UNIT HABITAT MANAGEMENT PLAN

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Seek cooperative projects through statewide and local partnerships to improve the quality and quantity of deer habitat.
- Provide improved habitat security and escapement opportunities for deer, keeping habitat restoration projects a priority for wildlife.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands. Continue working toward blocking up UDWR properties through land exchange.
- Manage vehicle access on Division of Wildlife Resources land to limit human disturbance during times of high stress, such as winter and fawning.

Habitat Improvement

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects such as lop & scatter bullhog and chaining.

- Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Continue involvement with local Monroe Mountain Working Group allowing for involvement and guidance to enhance and support habitat restoration efforts through local partnerships.
- Restore the Elbow Ranch WMA to Agriculture production such that it benefits mule deer.
- Future habitat work should be concentrated to increase the following management priorities:
 - Increase browse species within critical winter range, and burned areas.
 - Address unhealthy sagebrush winter range on NW part of the unit.
 - Improve and enhance WMA winter carrying capacity for mule deer.
 - Enhance critical winter range throughout the unit.
 - Support enhancement and restoration efforts in Quaking Aspen forests unit wide.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.
 - When selecting and implementing habitat restoration projects, design and develop with important wildlife benefits for mule deer.

Completed WRI Projects 2015-2019, 22,507 total acres

Current projects are being implemented and significant future projects are being recommended for the unit.

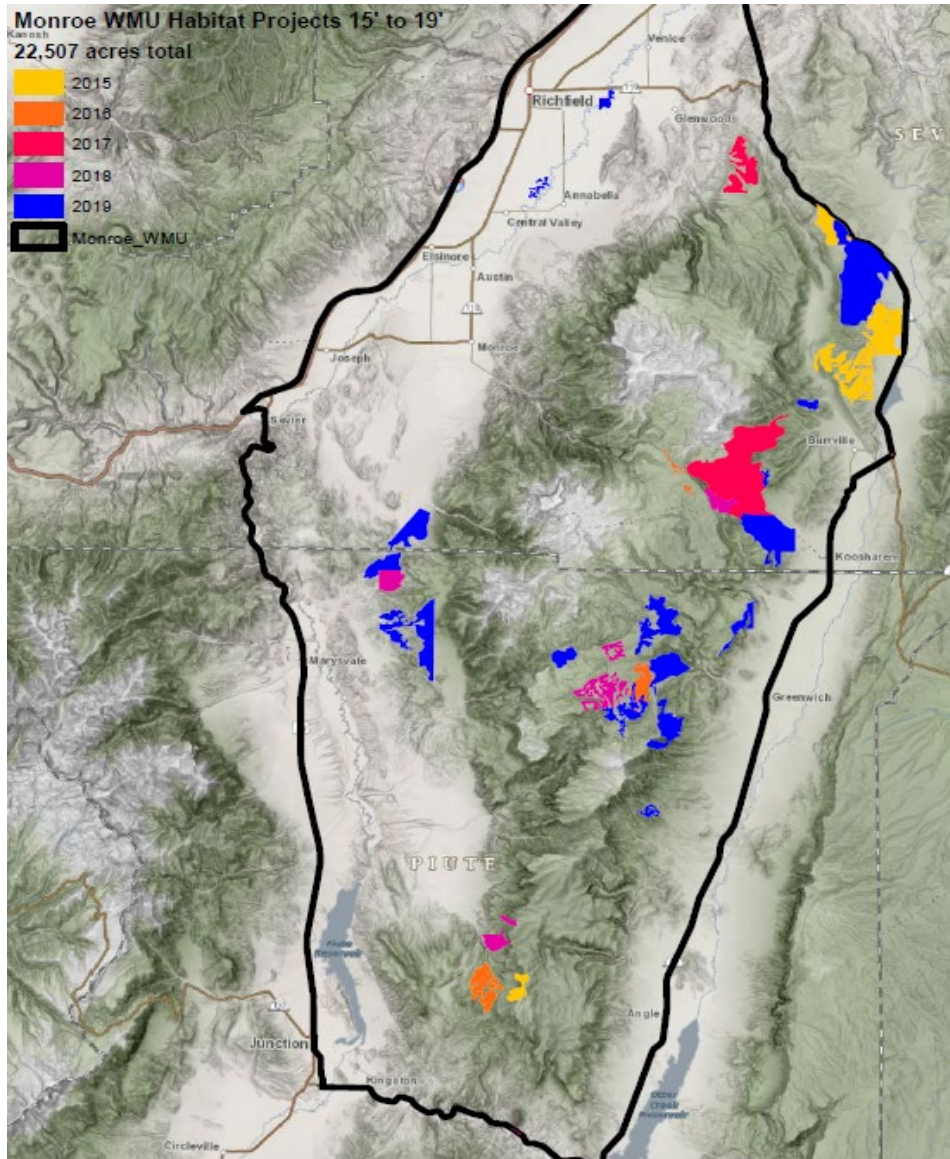


Figure 1

The following habitat information has been taken from the Utah Division of Wildlife Resources 2017 Range Trend Summary Report. Each management unit is examined on a 5-year rotation.

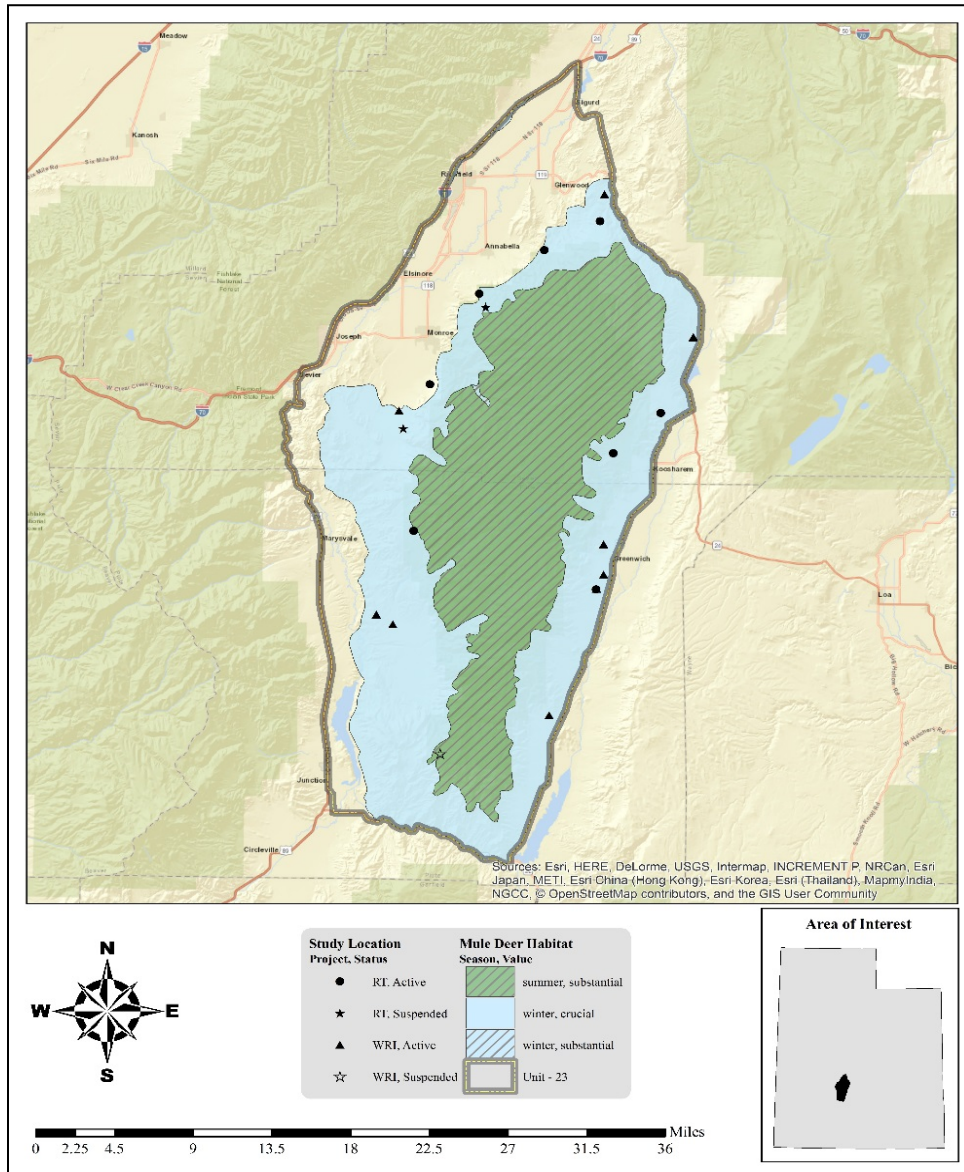


Figure 2

Management Unit Description

Geography

The Monroe Management Unit is almost entirely considered as big game habitat, with the exception of the desert areas and some of the incorporated townships. A majority of this unit is publicly managed on both winter and summer ranges. The permanent range trend studies have been established on both sides of the Sevier Plateau in both Central Valley and the areas between Otter Creek Reservoir and Koosharem. Significant amounts of the winter range occur on publicly managed lands. Towns within this unit include Richfield, Monroe, Glenwood, Annabella, Koosharem, and Marysvale.

The primary geographic feature on this unit is the Sevier Plateau, with the highest point being Glenwood Mountain at 11,208 feet. The lowest part of the unit is in the Central Valley near Richfield at around 5,300 feet. The mountains are not particularly rough, with the large plateau averaging between 9,000 to 10,000 feet; a majority of the summer habitat for this unit exists on the plateau.

Limiting Factors to Big Game Habitat

There are a few factors that limit big game habitat in the Monroe unit. Pinyon-Juniper woodlands account for 27.9% of the Monroe unit. Conifer encroachment into sagebrush communities has been shown to decrease sagebrush and herbaceous cover, therefore decreasing available wildlife forage (Miller, Svejcar, & Rose, 2000). An additional limiting factor is the encroachment of conifer into high elevation summer ranges; prescribed fires have been used to reduce conifer cover and to regenerate aspen stands in these ranges.

Other limiting factors to big game habitat include introduced exotic herbaceous species, such as cheatgrass (*Bromus tectorum*). According to the current Landfire Existing Vegetation Coverage model, 3.86% of the unit is comprised of exotic herbaceous species. Increased amounts of cheatgrass increase the risk for catastrophic wildfire (Balch, D'Antonio, & Gómez-Dans, 2013). The unit has had several wildfires, resulting in loss of big game habitat. The Poverty Flat area suffered from a wildfire in 1997, and recovery of browse species has been slow. Some of the drier portions of the unit have experienced sagebrush die-off from drought, which is often also in severe winter habitat.

Big Game Habitat

It is estimated that there are 326,742 acres that are classified as mule deer range on Unit 23. Of these acres, 46% is classified as summer range and 54% is classified as winter range. The Bureau of Land Management (BLM) manages 56% of the winter range, the United States Forest Service (USFS) manages 24% of the range, 8% is privately owned, School and Institutional Trust Lands Administration (SITLA) manages 8% of the winter range, Utah Division of Wildlife Resources (UDWR) manages 2%, Utah Department of Transportation manages <1%, and another <1% is tribally owned. The elk winter range has 44% managed by the BLM, 42% managed by the USFS, SITLA manages 7%, 6% is privately owned, 2% is managed by UDWR, and less than 1% is tribally owned. Most of the summer range for deer is on Forest Service land and provides good access for hunting.

Deer winter range is mostly located around the lower-elevation edges of the Sevier Plateau between 5,500 and 8,200 feet. The winter range is bounded on the lower edge by Highway 89 on the west and

Highways 24 and 62 on the east. On the northern portion of the mountains, the winter range is limited in size and there is potential for conflicts with animals using agricultural areas in the winter because of the proximity to traditional winter ranges.

Significant amounts of the winter range consists of sagebrush, with smaller amounts being host to mixed mountain brush communities. Many of the sagebrush communities are composed of mountain big sagebrush. There are some issues with excessive decadence and mortality in some portions of this unit, particularly low precipitation areas. Significant amounts of pinyon-juniper are present at the lower elevations, which can pose a threat to the integrity and productivity of the sagebrush ecosystems. At the higher elevations, some of the aspen stands are being encroached by conifer trees, which can lower quality of the summer habitat.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Monroe management unit has continually changed on the sites sampled since 1998. The active Range Trend sites sampled within the unit are considered to be in very poor to good condition as of the 2017 sample year (**Figure 3**). Bear Ridge improved to good condition, and Koosharem Canyon improved to fair-good condition. The Burrville Cemetery study is considered to be in fair condition. Smith Canyon improved to poor condition. Thompson Creek was considered to be in very poor-poor condition. Saul Meadow and Corner Spring Canyon were considered as being in very poor condition.

High annual grass cover, low perennial grass cover and lack of browse were contributing factors to the lower quality sites. The treated sites have generally shown improvement as time since treatment has increased (**Figure 4**). The exceptions to this are Elbow Ranch 1 and Glenwood Chaining which remained in very poor condition, Elbow Ranch 2 and Browns Canyon Drill which remained in good condition, and South Narrows which deteriorated from very poor-poor to very poor. It is possible given more time and continual monitoring that these sites will (continue to) improve.

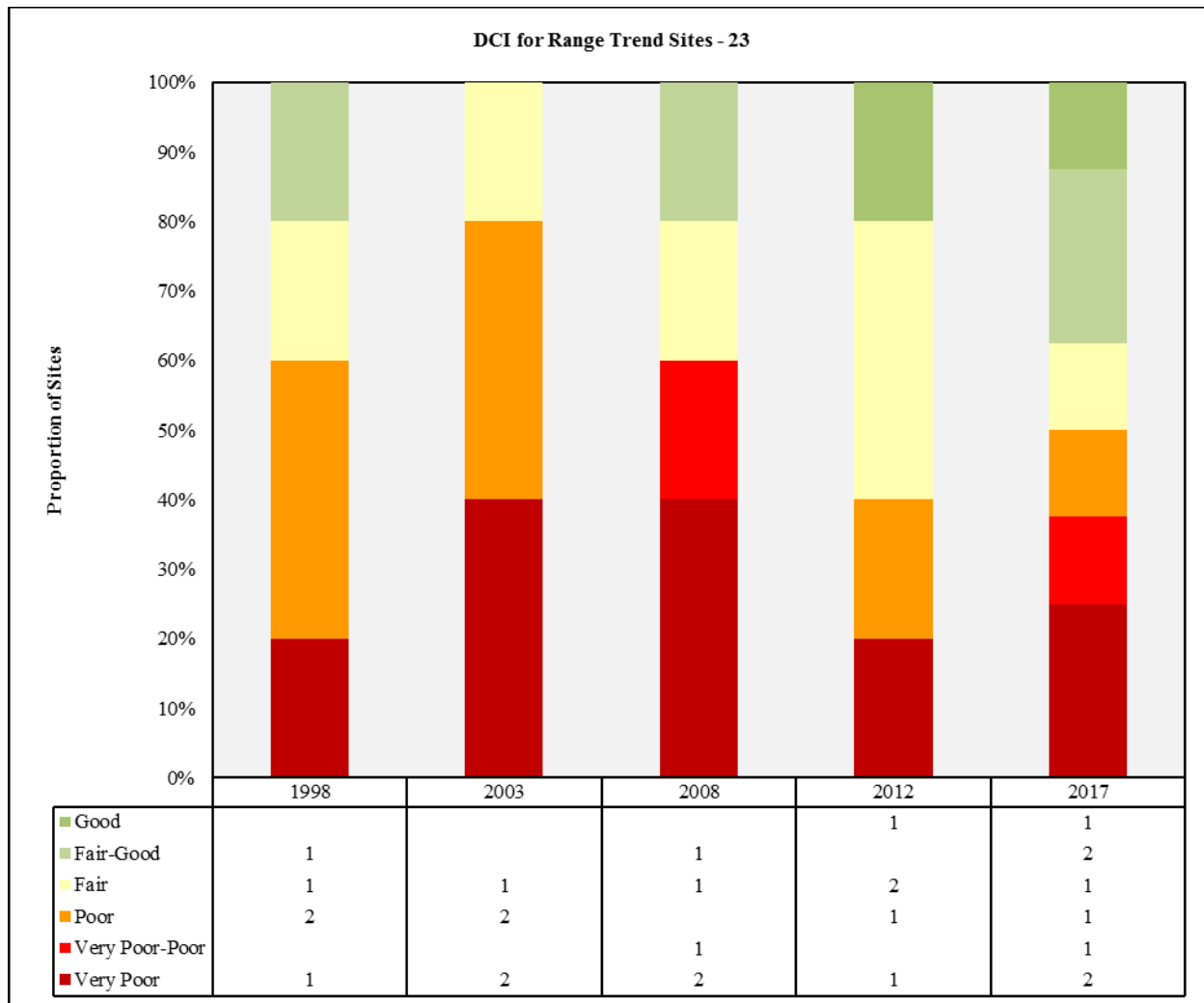


Figure 3: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 23, Monroe.

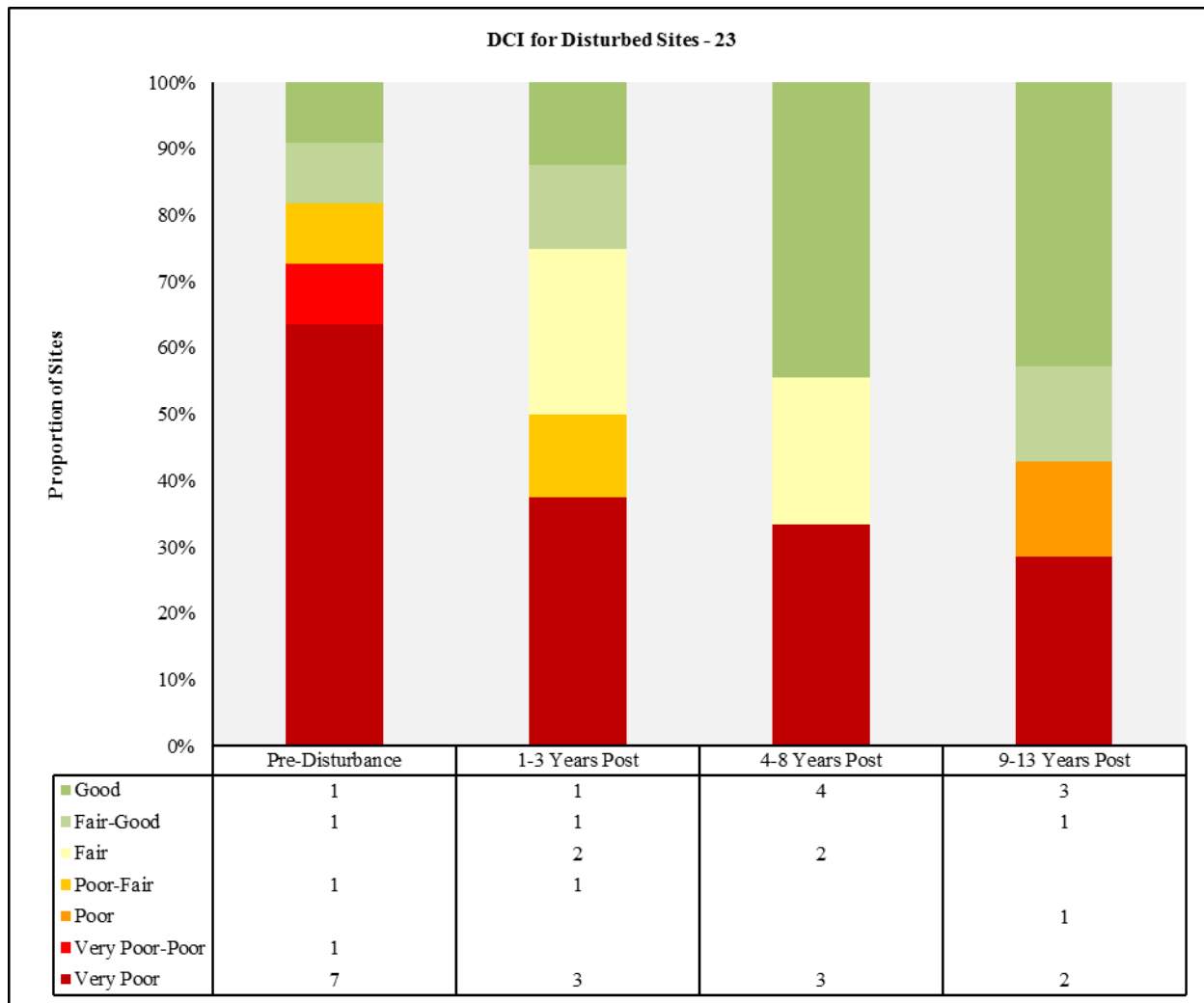


Figure 4: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 23, Monroe.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 24
Mt. Dutton
2020

BOUNDARY DESCRIPTION

Garfield and Piute counties - Boundary begins at US-89 and SR-62; south on US-89 to SR-12; east on SR-12 to the Widtsoe-Antimony road; north on the Widtsoe-Antimony road to SR-22; north on SR-22 to SR-62; west on SR-62 to US-89.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	YEARLONG RANGE		SUMMER RANGE		WINTER RANGE		TOTAL ACRES
	Area (acres)	%	Area (acres)	%	Area (acres)	%	
Forest Service	8,374	34%	131,391	100%	106,357	42%	246,122
Bureau of Land Management	1,166	5%	0	0%	76,366	30%	77,532
Utah State Institutional Trust Lands	623	2%	20	1%	35,768	14%	36,411
Native American Trust Lands	0	0%	0	0%	0	0%	0
Private	14,450	59%	30	0%	28,772	11%	43,252
Bankhead Jones	0	0%	0	0%	7,225	3%	7225
USFWS Refuge	0	0%	0	0%	0	0%	0
National Parks	0	0%	0	0%	0	0%	0
Utah State Parks	0	0%	0	0%	0	0%	0
Utah Division of Wildlife Resources	0	0%	0	0%	244	0%	244
TOTAL	24,663	100%	131,440	100%	254,733	100%	410,786

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.
- Continue to review habitat boundaries and look for ways to improve boundaries that provide for better social and biological needs on the unit.

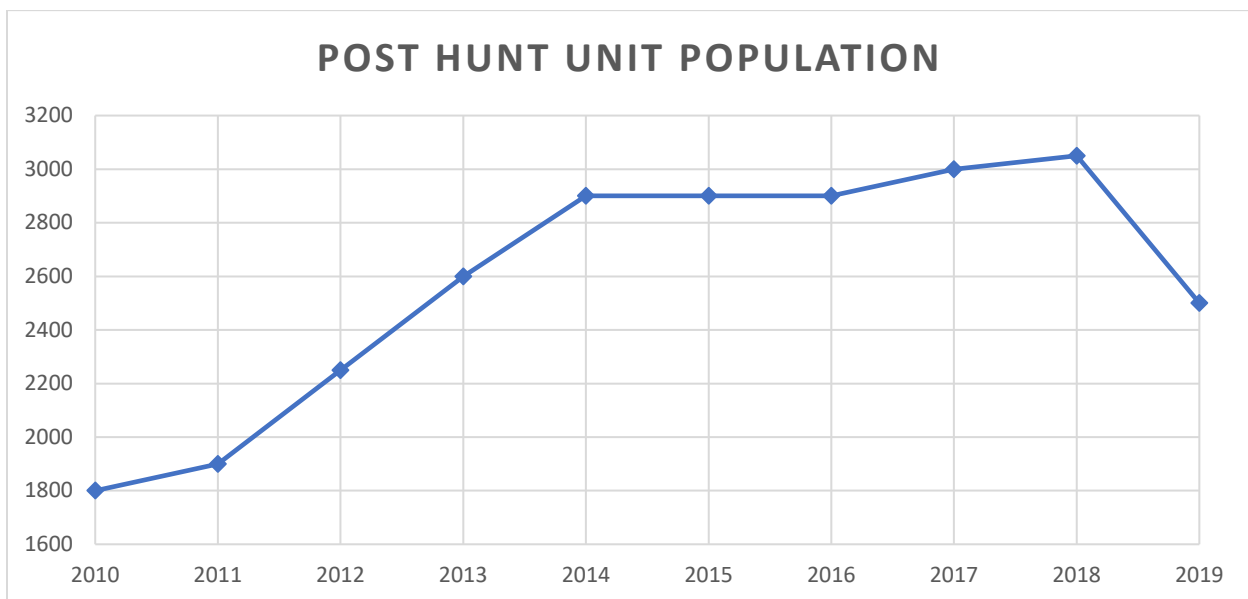
POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size - Manage for a 5-year target population of **3,200** wintering deer (modeled number) during the five-year planning period; unless range conditions become unsuitable as evaluated by DWR. This is an increase from the 2015 plan, which was 2,700. The 10-year average population estimate is 2,570. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.

Herd Composition – This is a General Season unit and will be managed to maintain a three year average postseason buck to doe ratio of **18-20** according to the statewide plan.

Harvest – General season hunting will be used to maintain and work towards objectives on this unit. Hunting strategies will include using Archery, Rifle, and Muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives.

A Limited Entry muzzleloader hunt will also be offered on this unit in early November. Permits will be recommended up to 0.5% of the general-season draw permit total with a minimum of 5 permits on the unit.



POPULATION MANAGEMENT STRATEGIES

Monitoring

- **Population Size** - Utilizing harvest data, postseason and spring classifications, and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 model estimates the population at 2,500 deer.
- **Buck Age Structure** - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- **Harvest** - The primary means of monitoring harvest will be through the statewide uniform harvest survey, checking stations, and field bag checks. Achieve the target population size by use of antlerless harvest using a variety of harvest methods and seasons. Recognize

that buck harvest will be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck:doe ratios.

Limiting Factors (May prevent achieving management objectives)

- **Crop Depredation** - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- **Habitat** - Public land winter range availability, landowner acceptance and winter range forage conditions will determine herd size. Excessive habitat utilization will be addressed with hunting.
- **Predation** - Follow DWR predator management policy.
- **Highway Mortality** - Cooperate with the Utah Department Of Transportation (UDOT) in construction of highway fences, passage structures and warning signs etc. Highway mortality occurs on U.S. 89 and SR 62, but is not a serious problem and is concentrated in only a few locations on this unit. Concentrated highway mortality occurs on US 89 south of Circleville. Illuminated warning signs are installed in this area.
- **Illegal Harvest** - If illegal harvest is identified as a significant source of mortality, an attempt to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Seek cooperative projects to improve the quality and quantity of deer habitat.
- Provide improved habitat security and escapement opportunities for deer.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality.

- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Work with land management agencies to evaluate and develop motorized travel plans to reduce disturbance during times of high stress, such as winter and fawning.

Habitat Improvement

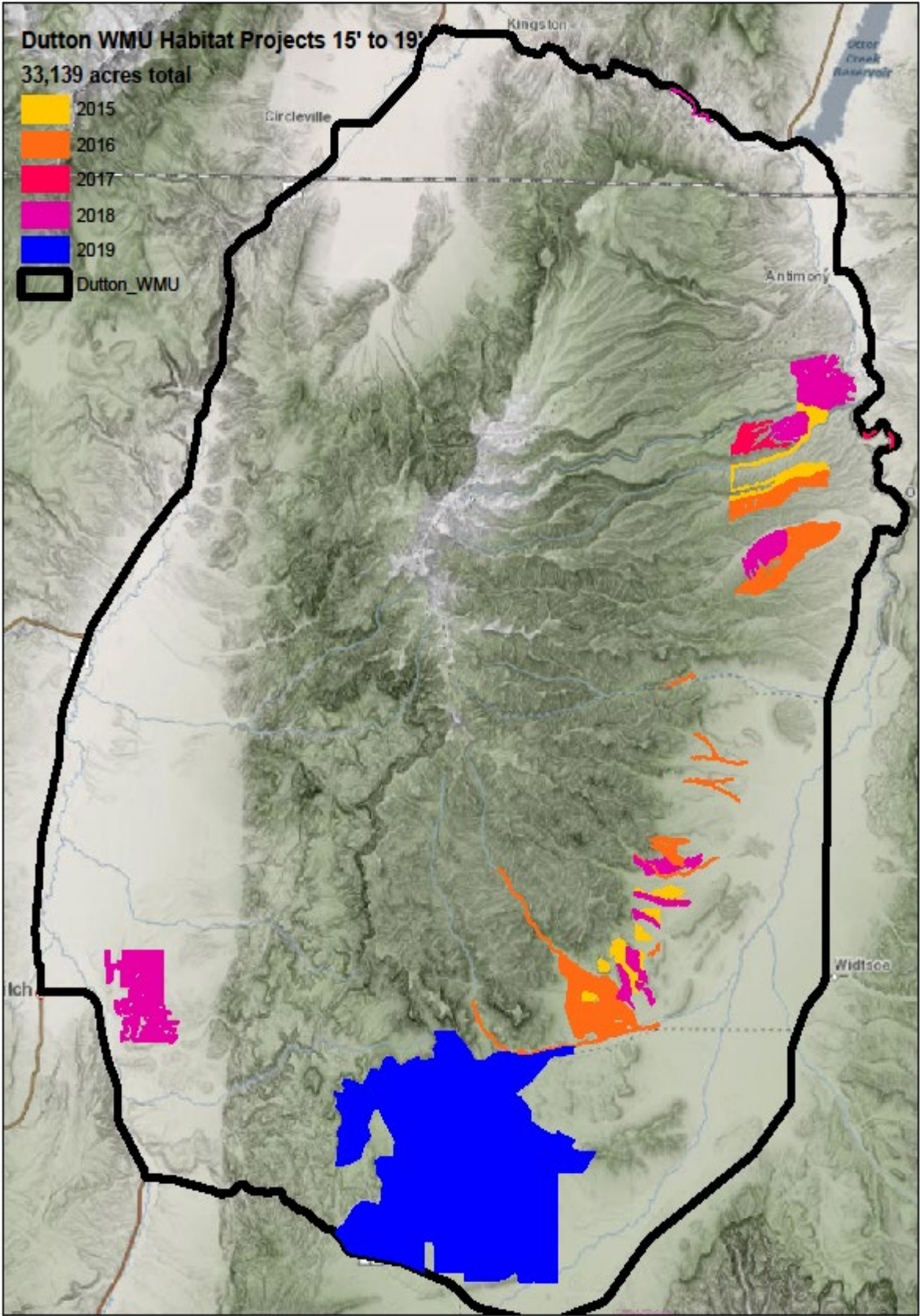
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding wildfire areas, creating fuel breaks and vegetated green strips and reseed areas dominated by Cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Future habitat work should be concentrated on the following areas.
 - Continue to reduce Pinyon and Juniper encroaching into shrubland, specifically in John's Valley, Pole Canyon north into Kingston Canyon, and south of Circeville into Horse Valley and other areas in critical winter range.
 - Seek opportunities on Panguitch East bench to reduce Sagebrush age class homogenization and increase species diversity.
 - Seek opportunities to increase browse and perennial forbs in areas of critical winter range through mechanical treatment and reseeding

Treatments and Restoration Work

- There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 27,070 acres have been treated within the Mt. Dutton unit since the WRI was implemented in 2004 (Map 2.6). Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah. The majority of treatment acreage, especially bullhog, chaining, lop and-scatte and seeding, was done to reduce pinyon and juniper woodlands. Other common management treatments are those to rejuvenate sagebrush stands such as chaining, mowing and harrow treatments. Herbicide treatments within the unit are primarily used to control cheatgrass and restore other more desirable species.

Type	Completed Acreage	Current Acreage	Pending Completed Acreage	Proposed Acreage	Total Acreage
Anchor Chain	6,255	0	586	0	6,841
Ely (One-Way)	596	0	586	0	1,182
Ely (Two-Way)	5,659	0	0	0	5,659
Bullhog	5,993	1,049	0	895	7,937
Full size	4,730	1,049	0	895	5,779
Skid steer	1,264	0	0	0	1,264
Chain Harrow	990	0	0	0	990
≤15 ft. (One-Way)	990	0	0	0	990
Disc	193	0	0	0	193
Plow (One-Way)	193	0	0	0	193
Harrow	1,423	0	150	0	1,573
≤15 ft. (One-Way)	732	0	150	0	882
>15 ft. (One-Way)	692	0	0	0	692
Mowing	24	0	0	0	24
Other	24	0	0	0	24
Seeding (Primary)	4,178	0	0	0	4,178
Broadcast (Aerial-Fixed Wing)	220	0	0	0	220
Drill (Rangeland)	63	0	0	0	63
Ground (Mechanical Application)	3,895	0	0	0	3,895
Vegetation Removal/Hand Crew	4,634	2,462	0	6,569	13,665
Lop & Scatter	4,634	2,462	0	6,569	13,665
Other	482	0	0	0	482
Road Decommissioning	482	0	0	0	482
Grand Total	24,172	3,511	736	7,464	35,883
* Total Land Area Treated	21,496	3,511	736	1,327	27,070

- **Table 2.1:** WRI treatment action size (acres) for completed, current, and proposed projects for WMU 24, Mt. Dutton. Data accessed on 02/18/2019. *Does not include overlapping treatments.



PERMANENT RANGE TREND SUMMARIES

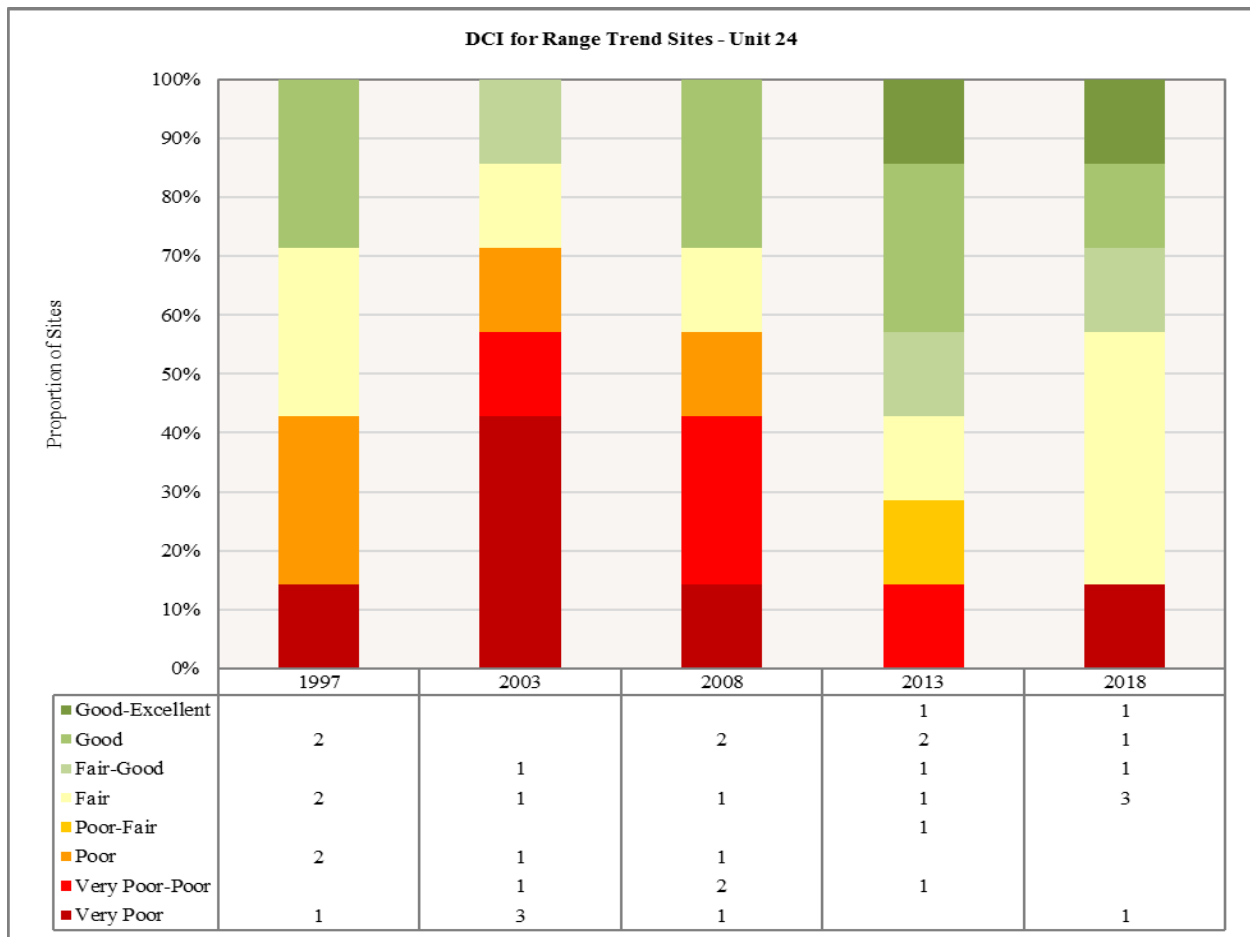


Figure 2.1: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 24, Mt. Dutton.

Unit 24 Mount Dutton

The condition of deer winter range within the Mt. Dutton management unit has generally improved on the study sites sampled since 1997. The majority of sites sampled within the unit are considered to be in fair to good condition based on the most current sample data, and the proportion of sites classified, as being in very poor condition has remained consistent.

The only undisturbed study during the report period that has consistently remained in very poor condition is the Marshall Basin study, which has maintained a depleted browse component, and an herbaceous understory lacking in perennial forbs

The condition of disturbed and treated sites typically improves with increased time after disturbance on this unit. Mud Spring Chaining, Panguitch East Bench Harrow, and Cow Creek are the three studies that fit within this generalization. Mud Spring Chaining did not show immediate improvement in condition following treatment, and only reaching fair condition 11-15 years following treatment. Panguitch East Bench Harrow attained good condition 6-5 years following treatment, and Cow Creek's condition improved to good 1-5 years following treatment. All other remaining studies within the unit are within the pre-treatment sampling status. These study sites generally are still lacking in available browse and perennial forb species

The higher elevation upland and mountain sites that support Wyoming big sagebrush and mountain big sagebrush communities are generally considered to be in poor condition for deer winter range habitat on the Mt. Dutton management unit. These communities should have the potential to support robust shrub

populations that provide valuable browse in mild and moderate winters; however, drought conditions have limited browse suitability as valuable winter range.

The low elevation semidesert black sagebrush communities are generally considered to be in good condition for deer winter range habitat on the unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters.

The lower elevation semidesert Wyoming big sagebrush communities that have not been disturbed are generally considered to be in good condition for deer winter range habitat on the unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters. However, these communities are prone to wildfire. Similarly to semidesert black sagebrush communities, the Wyoming big sagebrush communities respond slowly to wildfire, pinyon-juniper encroachment, and cheatgrass invasion and this should be taken into consideration when performing habitat rehabilitation projects.

Precipitation

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2013. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011 (Figure 2.1a). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and 2013; and displayed years of moderate to extreme wet years in 1982-1985, 1993, 1995, 1999, 2001, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009 and 2012; and displayed years of moderate to extreme wet years in 1982-1985, 1997-1998, 2008 and 2011 (Figure 2.1b) (Time Series Data, 2018).

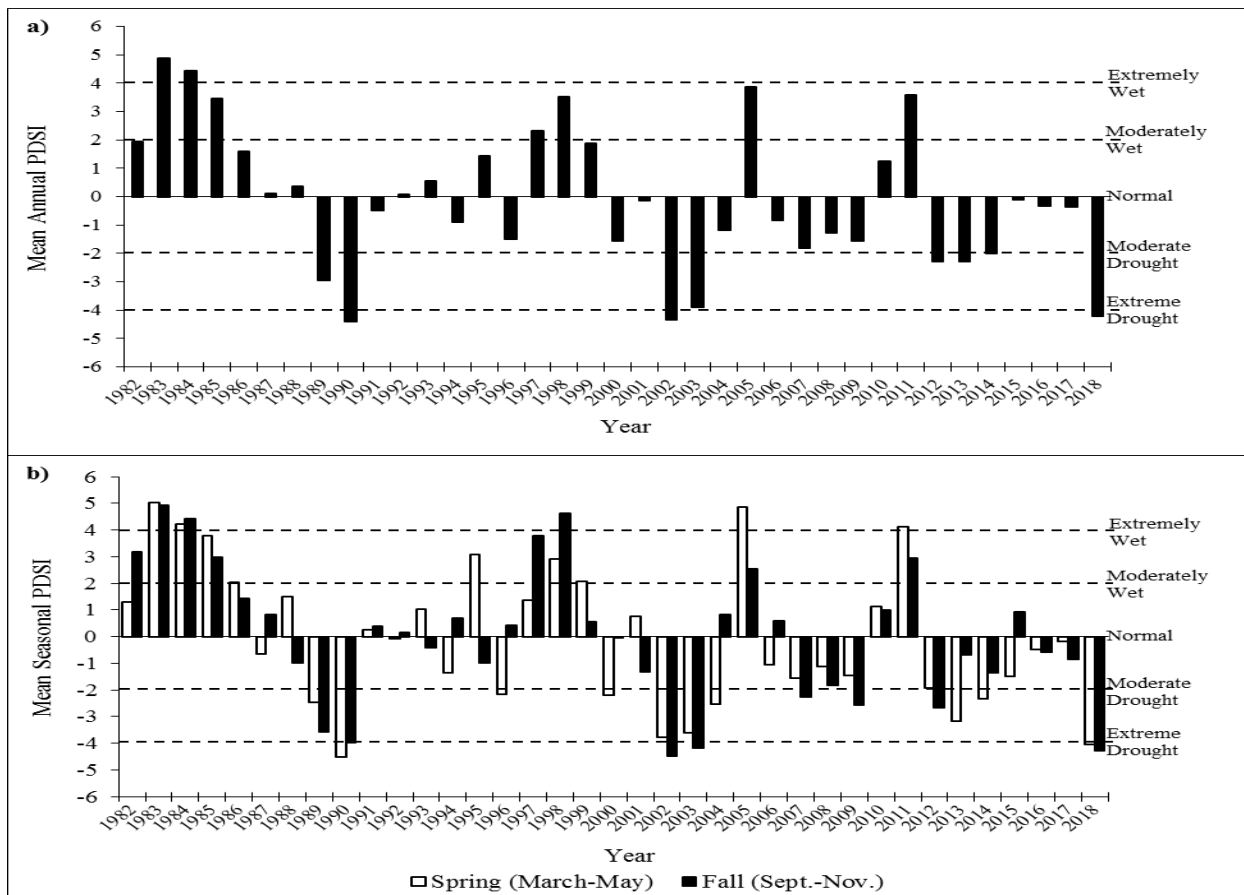
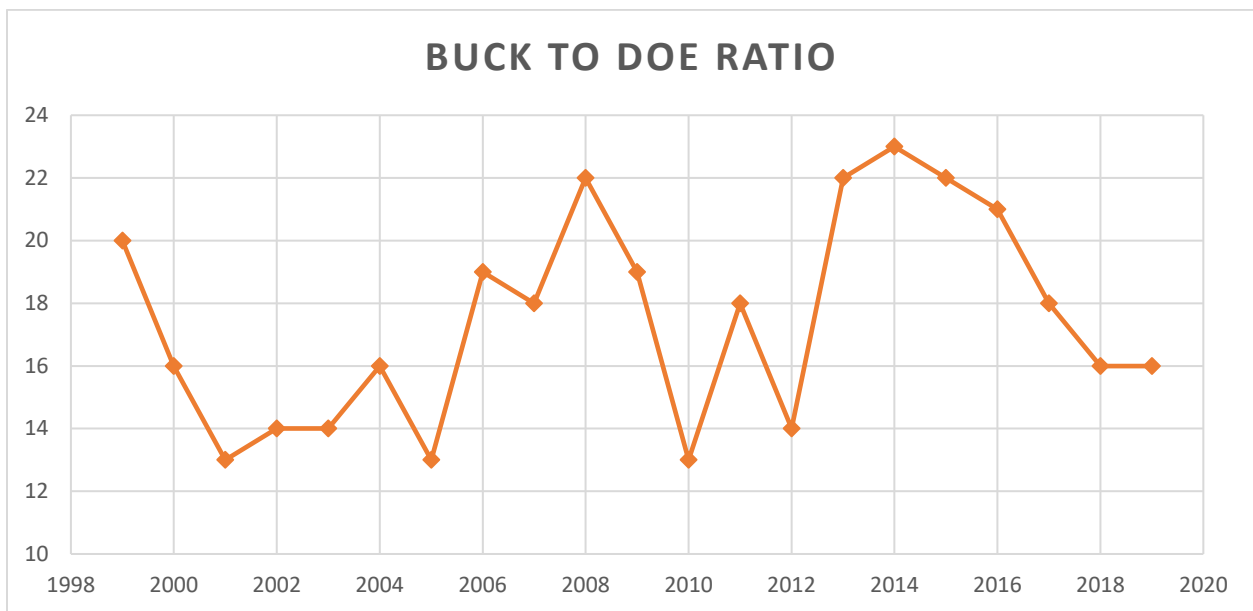
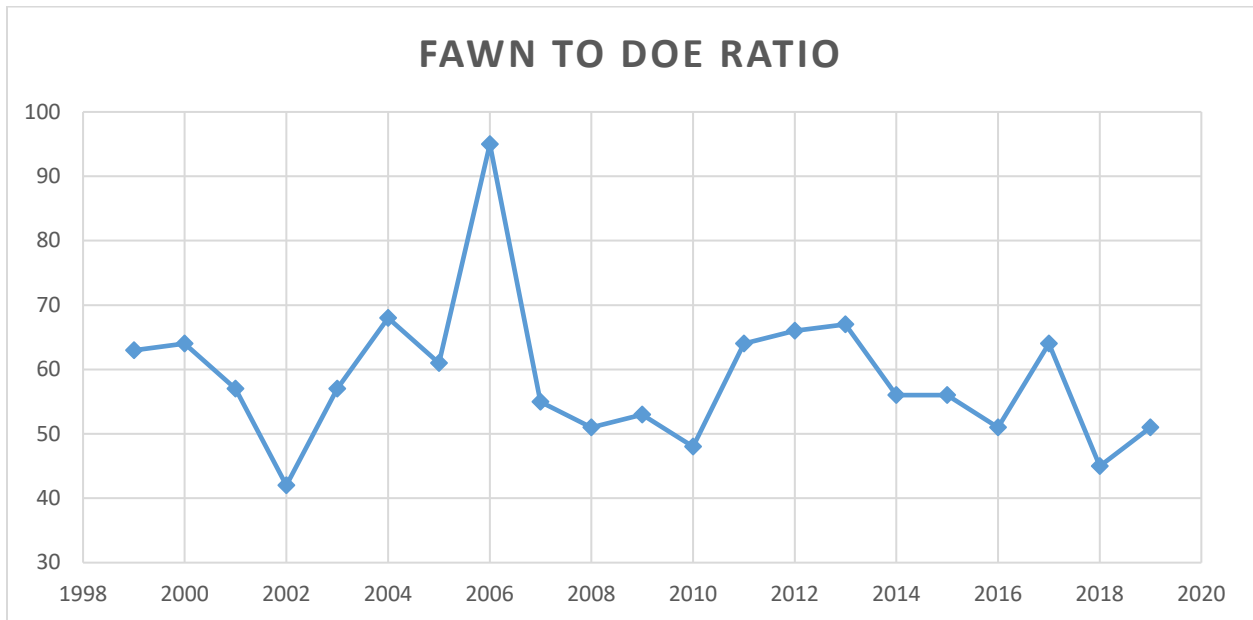


Figure 2.2: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).



Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit #25
Plateau, Fishlake #25A
Plateau, Thousand Lakes #25B
Plateau, Boulder #25C/Kaiparowits #26
2020

BOUNDARY DESCRIPTION

Sevier, Garfield, Piute, Kane and Wayne counties - Boundary begins at SR-24 and US-89 at Sigurd; south on SR-24 to SR-62; south on SR-62 to SR-22; south on SR-22 to the Widtsoe-Antimony road; south on the Widtsoe-Antimony road to SR-12; east on SR-12 to the Paria River; south on the Paria River to the Utah-Arizona state line; east along the state line to Lake Powell; along the shore of Lake Powell to the Burr trail road; north on the Burr Trail to the Notom Road; north on the Notom Road to SR-24; east on SR-24 to the Caineville Wash road; north on the Caineville Wash road to I-70; west on I-70 to US-89; south on US-89 to SR-24.

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- < Target Winter Herd Size - Achieve a target population size of 16,900 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.
- < Sub-unit #25A = 7,000
 - Adjust the target population objective from 10,000 to 7,000. The previous objective was not reached in the past 10 years. The average population for the last 10 years is 6,700.
- < Sub-unit #25B = 1,400
 - Adjust the target population objective from 3,000 to 1,400. The previous objective was not reached in the last 10 years. The average population for the last 6 years is 1,200.
- < Sub-unit #25C/26 = 8,500

- Adjust the target population objective from 13,000 (Boulder 12,000 and Kaiparowits 1,000) to 8,500. The previous objective was not reached in the last 10 years. The average population for the last 6 years is 7,800.
- Herd Composition – All units within this plan are General Season units and will be managed to maintain a three year average postseason buck to doe ratio of 18-20 according to the statewide plan.
- Harvest – General Buck Deer hunt regulations, using archery, early rifle, rifle, and muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives. Due to a history and concern of crowding, we may allocate some permits to an early any legal weapon in October as described in the statewide management plan.
- The Plateau, Thousand Lakes unit is geographically small, has a transient deer population, and a small deer herd, making it difficult to manage as an individual unit. We are considering combining this unit with the Plateau, Fishlake, within the life of this plan. Additional data collection efforts, analysis and outreach will be conducted prior to this recommendation.

Plateau Fishlake Harvest and Classification Data

Year	Buck Permits	Buck harvest	*Antlerless Harvest	Post-Season F/100 doe	Post-Season B/100 doe	**Post-Season Population Estimate	Objective
2010	2700	528	6	42	12	5900	10,000
2011	2100	368	5	53	19	6400	10,000
2012	1500	543	0	61	14	7000	10,000
2013	1300	554	3	71	19	7200	10,000
2014	1300	585	12	62	22	7900	10,000
2015	1300	654	12	71	24	8500	10,000
2016	1500	668	12	44	18	6800	10,000
2017	1400	517	37	57	15	6600	10,000
2018	1200	473	16	46	18	6300	10,000
2019	1100	375	16	45	17	5100	10,000
2020	950						
Avg.	1486	527	12	55	18	6770	

*Antlerless harvest targets deer living on agricultural ground.

**Population estimates are modeled population estimates.

Thousand Lakes Harvest and Classification Data

Year	Buck Permits	Buck harvest	*Antlerless Harvest	Post-Season F/100 doe	Post-Season B/100 doe	**Post-Season Population Estimate	Objective
2010	Limited Entry	35	8	58	20		3000
2011	Limited Entry	66	9	66	27		3000
2012	400	142	1	42	17		3000
2013	200	58	9	61	25	1300	3000
2014	200	76	8	58	28	1300	3000
2015	200	75	25	63	40	1400	3000
2016	300	107	29	50	21	1250	3000
2017	300	102	7	55	32	1150	3000
2018	300	87	10	63	26	1150	3000
2019	300	61	10	62	14	1000	3000
2020	250						
Avg.	272	89***	12	58	25***	1221	

*Antlerless harvest targets deer living on agricultural ground.

**Population estimates are modeled population estimates.

***Does not include years the unit was limited entry.

Boulder Harvest and Classification Data

Year	Buck Permits	Buck harvest	*Antlerless Harvest	Post-Season F/100 doe	Post-Season B/100 doe	**Post-Season Population Estimate	Objective
2010	2000	579	82	61	14		12000
2011	1700	407	51	64	16		12000
2012	1800	694	61	70	25		12000
2013	2000	694	60	57	16	7700	12000
2014	2100	824	113	57	20	8200	12000
2015	2200	995	183	65	21	8500	12000
2016	2200	1106	221	56	17	8500	12000
2017	2100	872	150	69	17	7900	12000
2018	2000	857	377	47	13	7200	12000
2019	1700	569	64	52	13	6600	12000
2020	1200						
Avg.	1909	760	136	60	17	7800	

*Antlerless harvest targets deer living on agricultural ground.

**Population estimates are modeled population estimates.

	Objective from past plan (2015)	2021-2025 Objective	Change
Plateau, Fishlake # 25A	10,000	7,000	-30%
Plateau, Fishlake Thousand Lakes #25B	3,000	1,400	-53%
Plateau, Boulder #25C/Kaiparowits #26	12,000	8,500	-29%
UNIT TOTAL	25,000	16,900	-32%

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 model estimates the population at 13,100 deer.
- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, statewide harvest survey data and bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide harvest survey and the use of checking stations.

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation - The Division of Wildlife Resources will maintain aggressive programs to eliminate or lessen the burden of deer depredation on private cultivated and stored agricultural crops. Crop depredation problems will be addressed as provided for in applicable laws, rules and policies, and procedures of Utah's Landowner Assistance Program for big game. When necessary, control hunts will be implemented through the RAC process. When a problem needs immediate attention, local biologists may call depredation hunts and issue mitigation permits to keep deer away from cultivated and stored agricultural crops. These control hunts will be specified in areas where only offending animals will be harvested. Applicable laws, policies, and procedures will also be followed to lessen the burden of big game on private rangelands.
- Habitat - The amount and condition of summer habitat on public lands and landowner acceptance and winter forage conditions on private lands will influence herd size. Excessive habitat utilization will be addressed through antlerless removal.
- Predation – DWR will follow the current DWR predator management policy.

- Highway Mortality – DWR will cooperate with the Utah Dept. of Transportation to construct highway fences, passage structures, warning signs, etc. if needed. Currently, highway mortality is not a limiting factor on this unit.
- Illegal Harvest - If illegal harvest is identified as a limiting factor, a unit specific action plan will be developed in cooperation with the Law Enforcement Section.

PLATEAU UNIT HABITAT MANAGEMENT OBJECTIVES

Deer Herd Unit # 25A (Plateau Fishlake)

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Encourage vegetation manipulation projects and seeding to increase the availability, abundance and nutritional content of browse, grass, and forb species.
- Seek cooperative projects and programs to encourage and improve the quality and quantity of deer habitat, with public and private land managers to maintain a stable or upward trend in vegetative composition.
- Provide improved habitat security and escapement opportunities for mule deer keeping habitat restoration projects a priority for wildlife.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection, Improvement and Maintenance

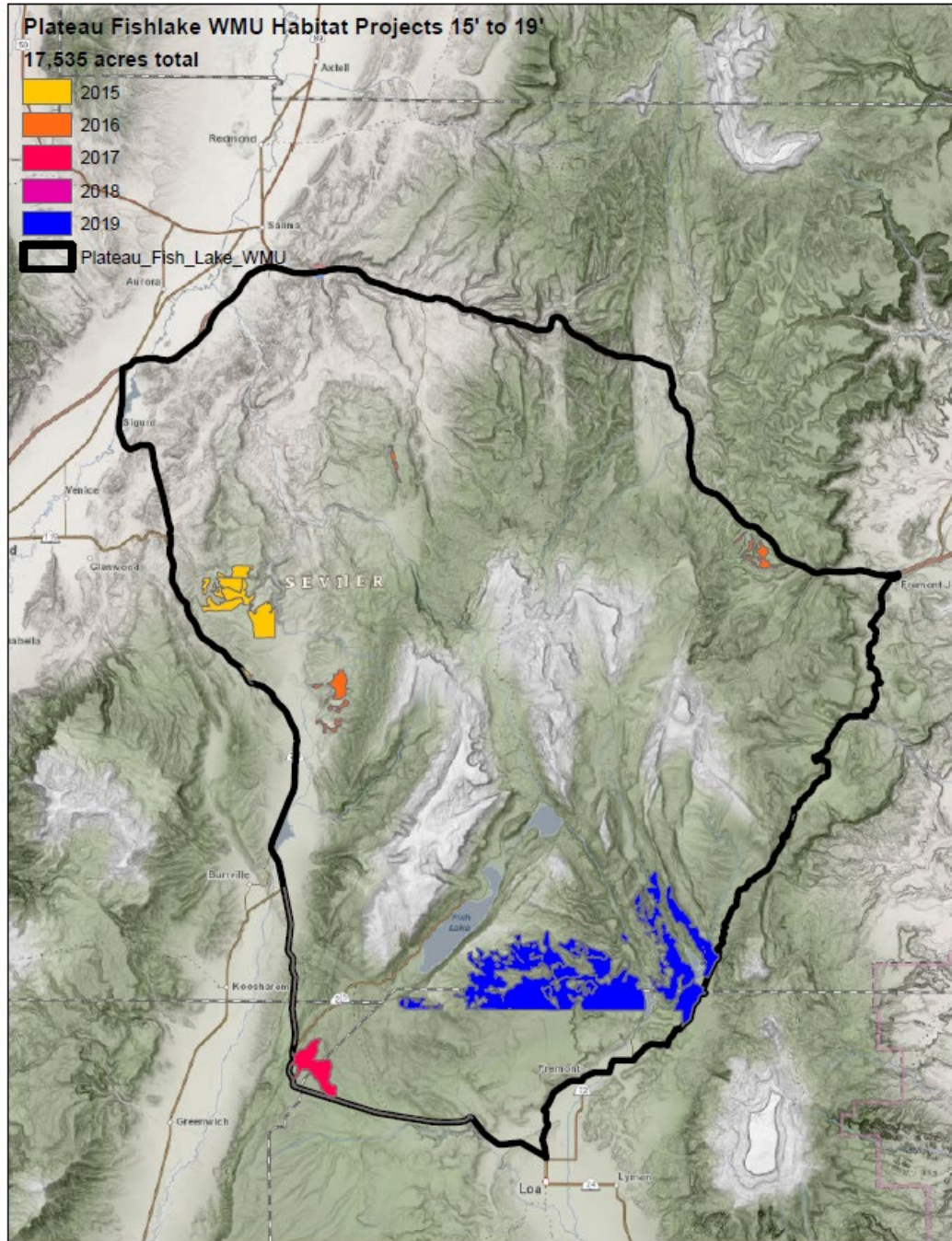
- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Continue to cooperate with Utah Department of Transportation (UDOT) and or Sportsman's groups to identify areas to mitigate and prevent deer-vehicle collisions to the extent possible.
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips.
- Reseed mechanical treatment areas with selected seed species that will out compete areas dominated by Cheatgrass with desirable perennial vegetation focusing on seeding native grass species.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog and chaining projects.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit.
- Future habitat work should be concentrated on the following management priorities:
 - Increase browse species in critical winter range, and burned areas.
 - Improve the carrying capacity of mule deer within the unit.
 - Increase critical winter range opportunities for mule deer.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to reduce threats to catastrophic wildfires, by reducing fuel loads and creating firebreaks.
 - When selecting and implementing habitat restoration projects, design and develop with wildlife benefit, including grass, forbs and shrubs for mule deer within the seed mixes.
 - Support enhancement and restoration efforts in Quaking Aspen forests unit wide by reducing encroachment of Spruce-Fir forests.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.

Treatment and Restoration Work

Treatment Action	Acres
Anchor Chain	1,421
Bullhog	574
Harrow	12,259
Herbicide Application	645
Mowing	2,522
Forestry Practices	52
Seeding (primary)	814
Hand Crew Vegetation Removal	7,478
*Total Acres Treated	25,765
Total Treatment Acres	17,874

Table 1.1: WRI treatment size by treatment action (2000-2018).

*Does not include overlapping treatments

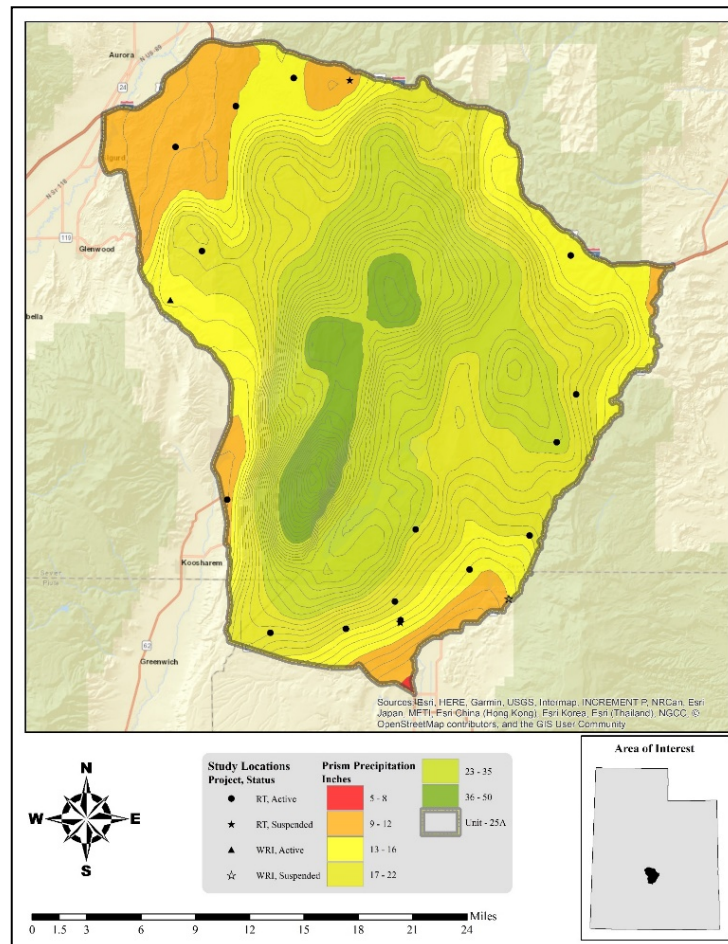


Map 1.1 WRI treatments by Fiscal Year (2015-2019)

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches on the south and northwest of the unit to 41 inches on the high elevation peak of the Fish Lake Hightop Plateau. All of the Range Trend and WRI monitoring studies on the unit occur within 11-23 inches of precipitation (**Map 1.2**).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2013. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011. The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and 2013; and displayed years of moderate to extreme wet years in 1982-1985, 1993, 1995, 1999, 2001, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009 and 2012; and displayed years of moderate to extreme wet years in 1982-1985, 1997-1998, 2008 and 2011.



Map 1.2: The 1981-2010 PRISM Precipitation Model for WMU 25A, Fishlake Plateau (PRISM Climate Group, Oregon State University, 2013).

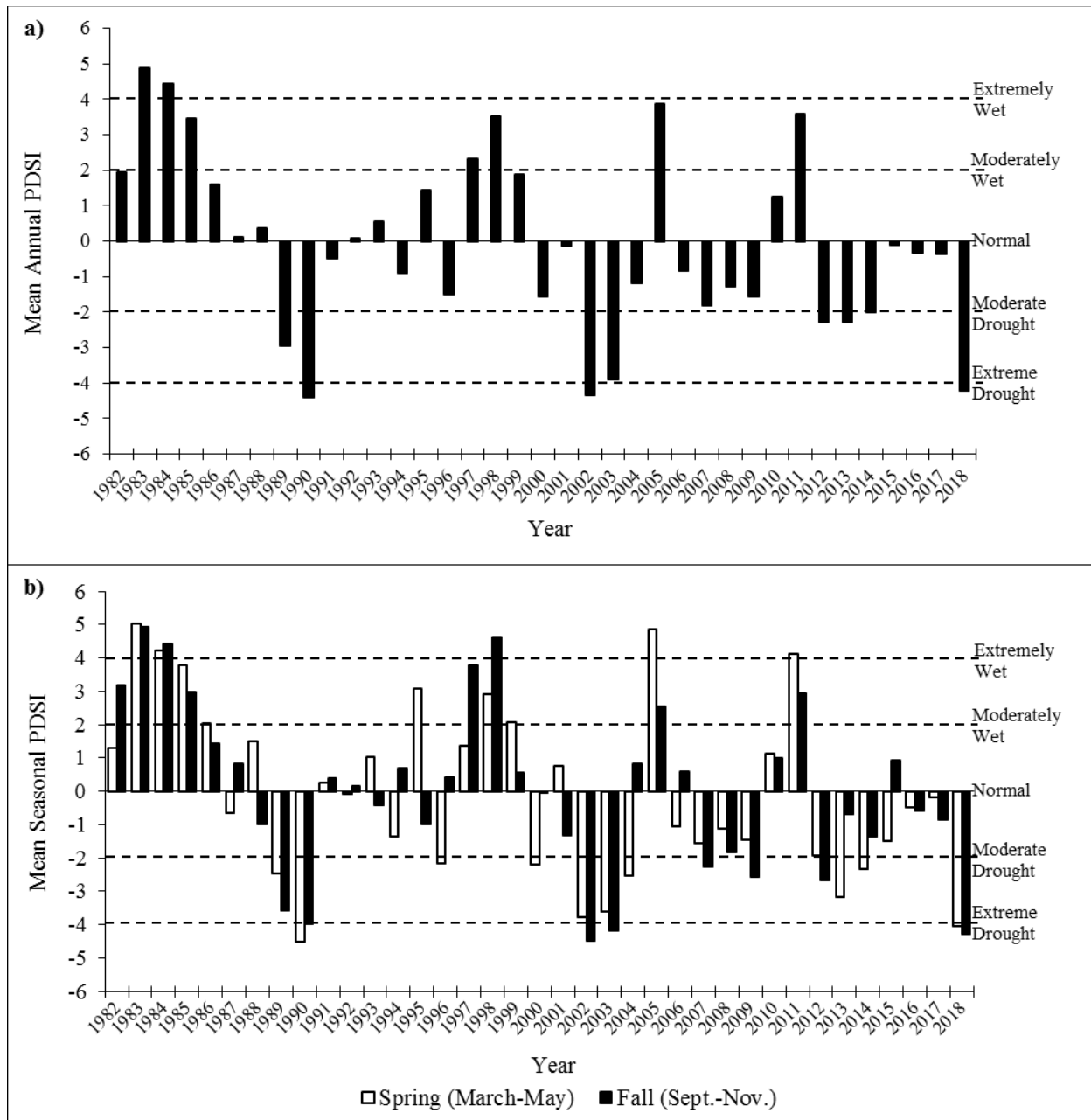


Figure 1.1: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).

Big Game Habitat

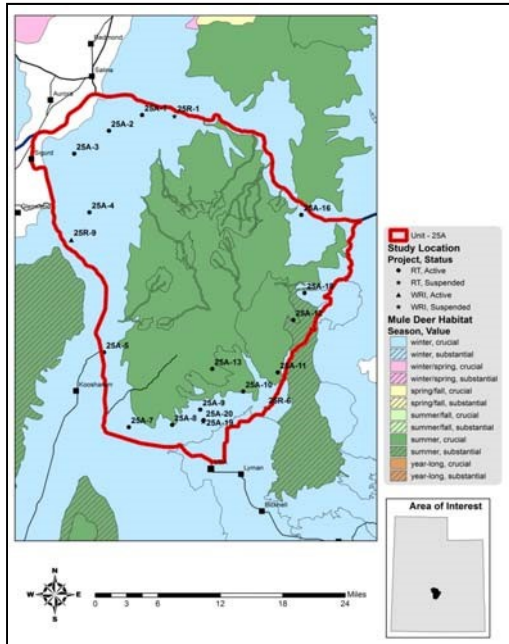
An estimated 428,775 acres are classified as deer range on 25A with 44% classified as winter range and 56% as summer range (**Table 1.2, Map 1.3**). The United States Forest Service administers 47% of the winter range, 28% is managed by the Bureau of Land Management (BLM), 16% is privately held, 8% is managed by the School and Institutional Trust Lands Administration (SITLA), and the Paiute Indian Tribe of Utah, Utah Department of Transportation (UDOT), and Utah Division of Wildlife Resources (UDWR) each manage less than 1%. (**Table 1.3, Map 1.4**).

The northern two-thirds of the unit include the high elevation Fish Lake Mountains which constitute summer range for deer and elk. Winter range is primarily confined to the lower elevations of the northern third of the unit and the sagebrush benches on the west side above Highway 24. Antelope are also present and are normally found in the more open areas of the deer and elk winter range. Excessive accumulations of snow during severe winters confine deer below the 8,600-foot contour. Pinyon-juniper on both normal and severe wintering areas provide extremely important protective cover for elk and deer, while the closely associated sagebrush type produces the bulk of the required forage.

Limiting Factors to Big Game Habitat

According to the current LANDFIRE Existing Vegetation Coverage model, just over 25% of the unit is comprised of pinyon-juniper woodlands. While these woodlands provide valuable escape and thermal cover for wildlife, encroachment and invasion into historic shrublands reduces available browse (Miller, Svejcar, & Rose, 2000) and may thereby decrease the carrying capacity of the unit.

In addition, annual grasslands primarily composed of cheatgrass (*Bromus tectorum*) comprise a small proportion of the deer winter range and pose a minimal threat to the resilience of the plant communities on this unit. Increased amounts of cheatgrass also increase fuel loads, potentially exacerbating the risk of catastrophic wildfire (Balch, D'Antonio, & Gómez-Dans, 2013).



Map 1.3: Estimated mule deer habitat by season and value for WMU 25A, Fishlake



Map 1.4: Land ownership for WMU 25A, Fishlake

	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
Mule Deer	241,169	56%	189,664	44%
Elk	187,480	44%	238,265	56%

Table 1.2: Estimated mule deer and elk habitat acreage by season for WMU 25A, Fishlake.

Ownership	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
USFS	199,169	83%	88,754	47%
BLM	5,507	2%	53,156	28%
SITLA	279	<1%	14,950	8%
Tribal Land	0	0%	51	<1%
Private	36,297	15%	32,657	17%
UDOT	0	0%	43	<1%
UDWR	0	0%	52	<1%
Total	241,169	100%	189,664	100%

Table 1.3: Estimated mule deer habitat acreage by season and ownership for WMU 25A, Fishlake.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Fishlake Plateau management unit has continually changed on the sites sampled since 1999. The active Range Trend sites sampled within the unit are considered to be in very poor to excellent condition as of the 2018 sample year (**Figure 1.2, Map 1.5**). The Tommy Hollow study is considered to be in excellent

condition, with high preferred browse cover and a robust understory contributing to this ranking. The four sites rated as being in good condition are Evans Reservoir, Lower Dog Flat, Row of Pines Exlosure, and Elk Camp. The one site in fair-good condition is the Row of Pines study. There is one study in poor-fair condition: the Durfee Homestead site. The Sage Flat study site is classified as being in poor condition. There is one study in very poor-poor condition: the Praetor Slope study. Finally, the two studies classified as being in very poor condition are Triangle Mountain and Black Mountain. Overall, the condition of the sites across the unit has slightly improved.

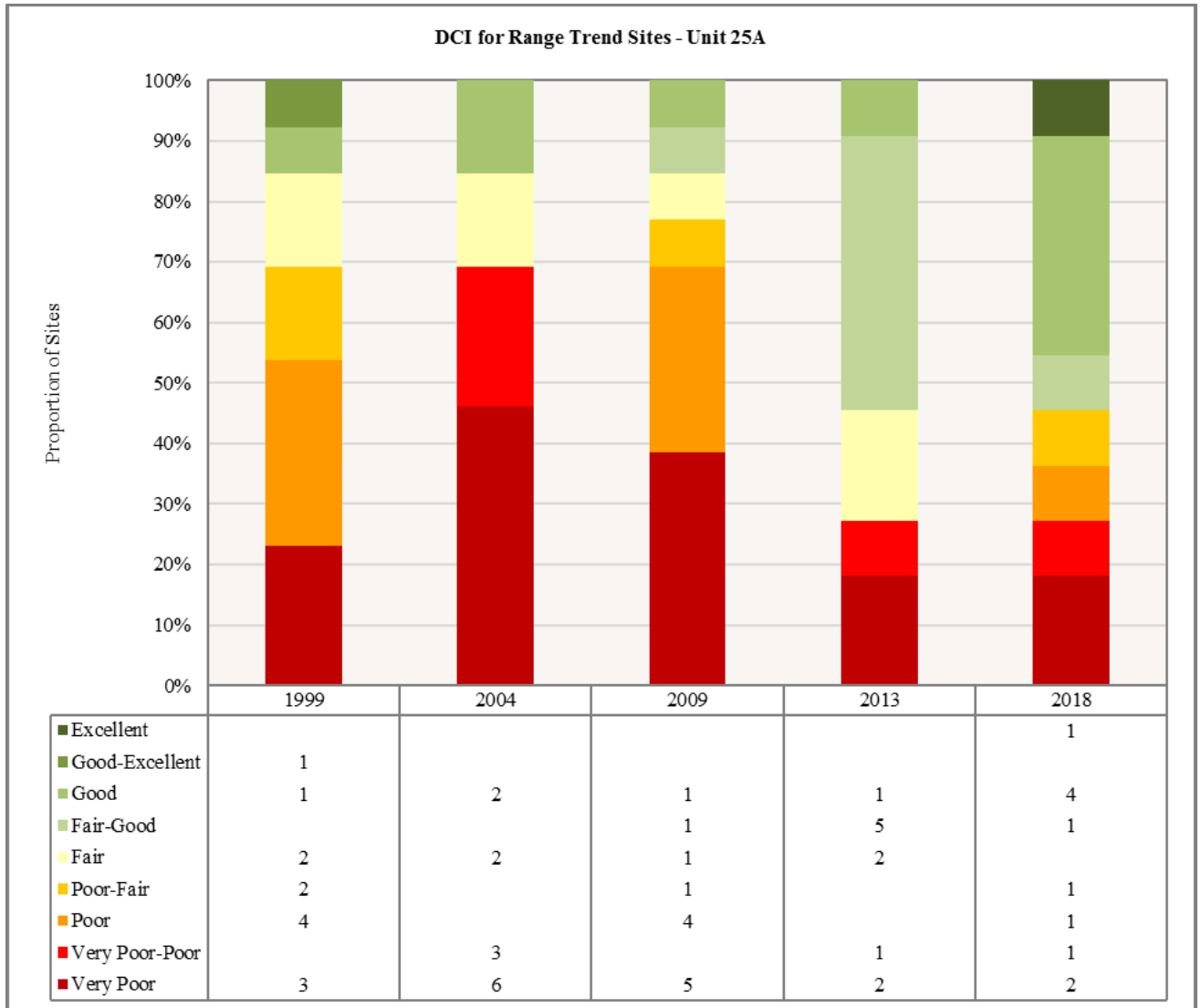
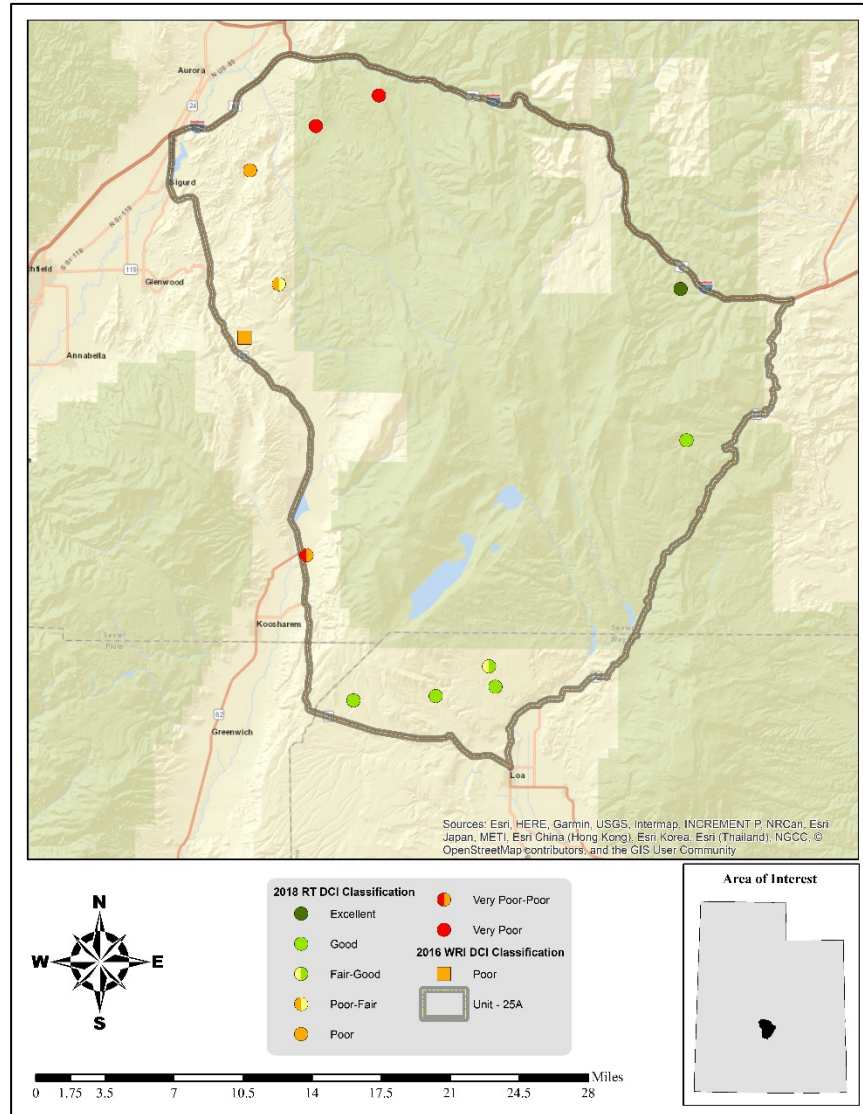


Figure 1.2: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 25A, Fishlake Plateau.



Map 1.5: 2018 Desirable Components Index (DCI) ranking distribution by study site for WMU 25A, Fishlake Plateau.

**Deer Herd Unit # 25B
(Plateau Thousand Lake)**

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts such as oil, gas, and coal mining that occurs within the unit.

- Encourage vegetation manipulation projects in PJ communities, with reseeding opportunities to increase the availability, abundance and nutritional content of browse, grass, and forb species.
- Seek cooperative projects and programs to encourage and improve the quality and quantity of deer habitat, with public and private land managers to maintain a stable or upward trend in vegetative composition.
- Provide improved habitat security and escapement opportunities for mule deer keeping habitat restoration projects a priority for wildlife, improvement of sagebrush communities is important on this unit.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies along with private landowners in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Manage vehicle access to limit human disturbance during times of high stress, such as winter and fawning, also work in conjunction with other land management agencies to help limit travel of off road vehicles during these critical times.

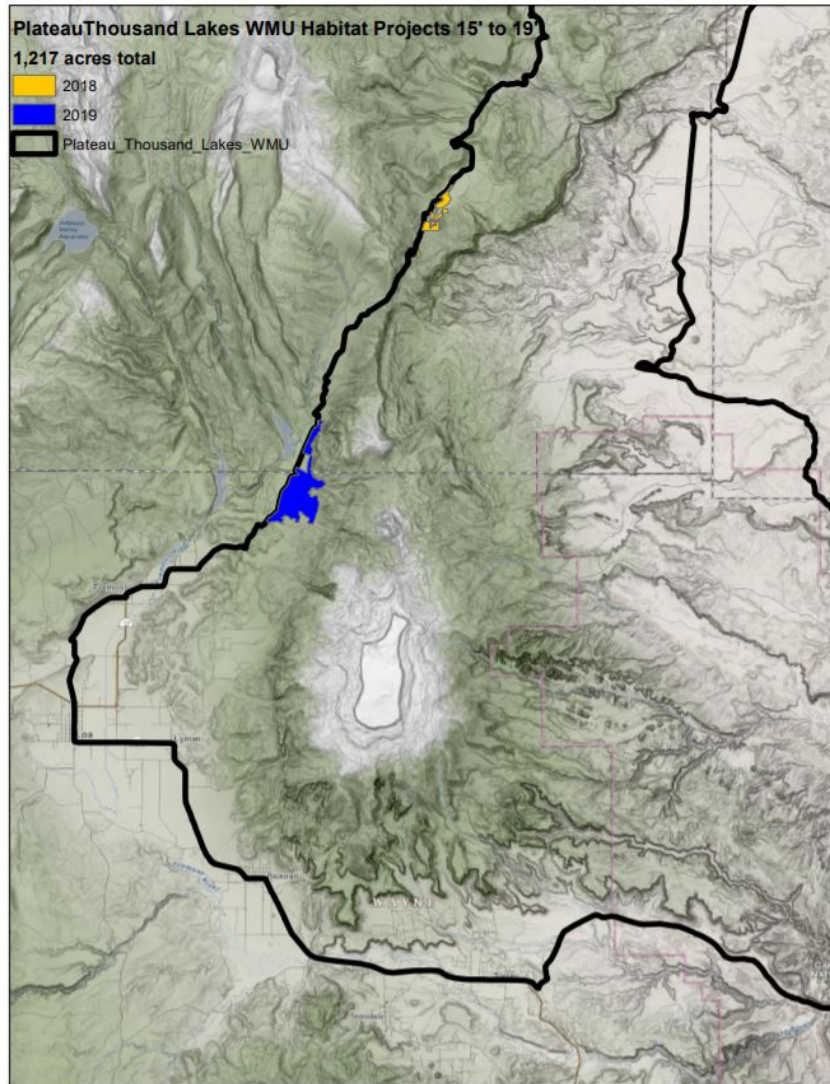
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reducing fuel loads, reseeding burned areas, creating fuel breaks and vegetated green strips.
- Reseed mechanical treatment areas with selected seed species with desirable perennial vegetation focusing on seeding native grass species. Unit is lacking in understory of herbaceous understory specifically forbs.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog treatments and chaining projects.
- Cooperate with federal land management agencies and local governments in developing and administering quality habitat restoration projects tied to management plans for the purposes of habitat protection, and livestock grazing.
- Future habitat work should be concentrated on the following management priorities:
 - Increase browse species in critical winter range areas, continue to seed a quality of grasses, forbs and shrubs in critical burned areas.
 - Improve the need for future carrying capacity of mule deer within the unit.
 - Increase critical winter range opportunities for mule deer by reducing PJ encroachment in mountain and upland communities.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit.
 - Continue to reduce threats to catastrophic wildfires, by reducing fuel loads and creating firebreaks.
 - When selecting and implementing habitat restoration projects, design and develop with wildlife benefit, including grass, forbs and shrubs for mule deer within the seed mixes.
 - Support enhancement and restoration efforts in Quaking Aspen forests within the unit by reducing encroachment of Spruce-Fir forests.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.

Treatment and Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 6,900 acres of land have been treated within the Thousand Lakes Plateau subunit since the WRI was implemented in 2004 (**Map 2.1**). An additional 1,905 acres are currently being treated and treatments have been proposed for 377 acres. Treatments frequently overlap one another bringing the total completed treatment acres to 9,182 acres for this unit (**Table 2.1**). Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Treatment Action	Acres
Anchor Chain	1,228
Bullhog	2,109
Harrow	6,652
Herbicide Application	390
Mowing	349
Prescribed Fire	1,900
Seeding (primary)	926
Hand Crew Vegetation Removal	5,192
Other	28
*Total Acres Treated	18,722
Total Treatment Acres	16,400

Table 2.1: WRI treatment size (acres. 2004-2018). *Does not include overlapping treatments



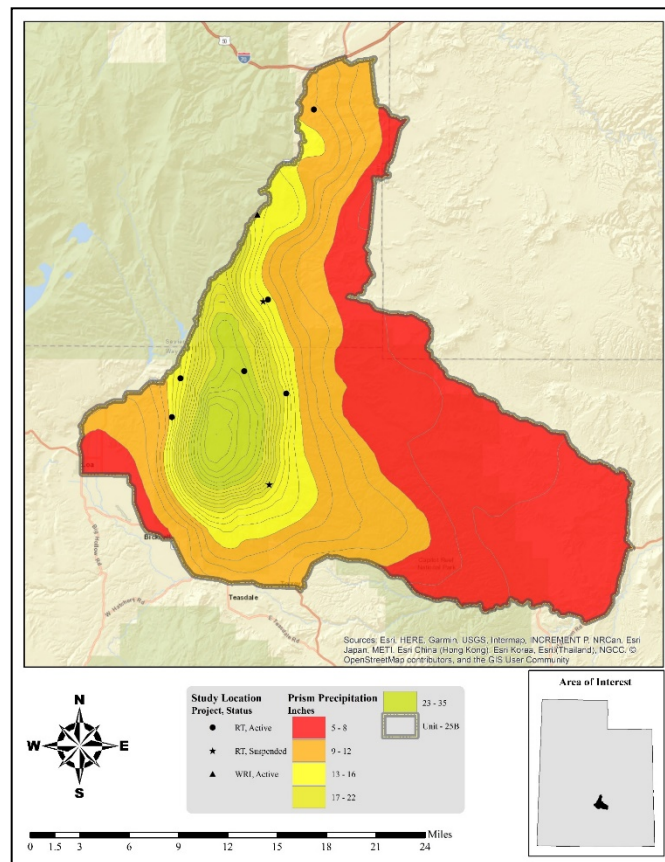
Map 2.1 WRI treatments by Fiscal Year (2015-2019)

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 6 inches on the lower east side of the unit to 29 inches on the peak of Thousand Lake Mountain. All of the Range Trend and WRI monitoring studies on the unit occur within 12-24 inches of precipitation (**Map 2.2**) (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4).

The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, 2012-2014, and 2018. The mean annual PDSI displayed moderately to extremely wet years from 1983-1985, 1997-1998, 2005, and 2011 (**Figure 2.1a**). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2000, 2002-2004, 2013-2015, and 2018. Moderately to extremely wet years for this time period were displayed in 1983-1986, 1995, 1998-1999, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009, 2012, and 2018; moderately to extremely wet years were displayed in 1982-1985, 1997-1998, 2005, and 2011 (**Figure 2.1b**) (Time Series Data, 2019).



Map 2.2: The 1981-2010 PRISM Precipitation Model for WMU 25B, Thousand Lake (PRISM Climate Group, Oregon State University, 2013)

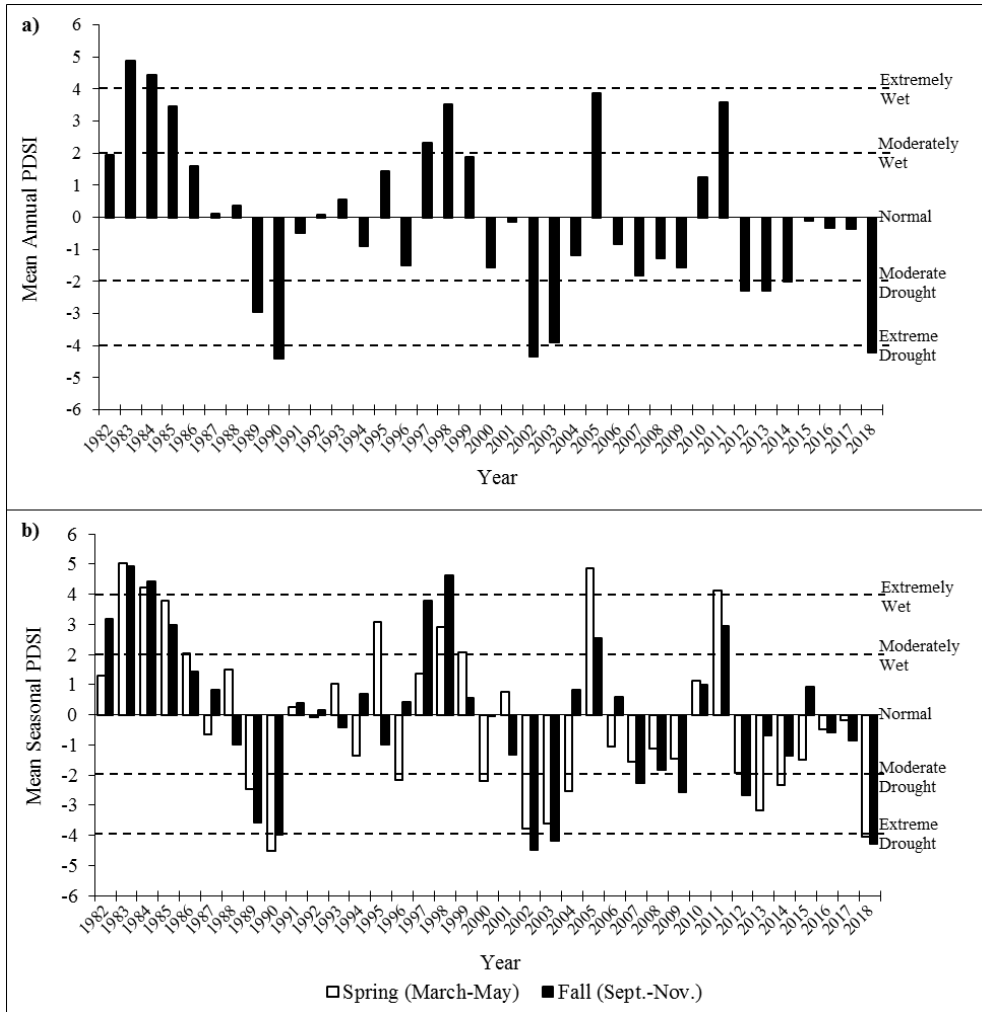


Figure 2.1: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).

Big Game Habitat

There are an estimated 507,865 acres classified as deer range within Unit 25B with 88% classified as winter range, 12% as summer range, and less than 1% as year-long range (**Table 2.2, Map 2.3**). The National Park Service (NPS) administers 37% of the deer winter range, 30% is managed by the Bureau of Land Management (BLM), 24% is administered by the United States Forest Service (USFS), 6% is privately held, the School and Institutional Trust Lands Administration (SITLA) manages 3%, and the Utah Department of Transportation (UDOT) and Utah Division of Wildlife Resources (UDWR) each administer less than 1% (**Table 2.3, Map 2.4**)

The winter range on this unit provides ample protective cover, large basins, draws, and open ridges. The upper limits of the normal winter range vary from 8,400 feet at the northern boundary to 9,000 feet on the south end of Thousand Lake Mountain. The lower normal winter range limit is between 6,000 and 7,400 feet in elevation. At present, the winter range appears ample to support the deer and elk from the Thousand Lakes unit and many wintering deer from the adjacent Fish Lake unit. Solomon Basin, Sage Flat, Horse Valley, Sand Flat, Paradise Flat, and Lyman Slopes are all winter concentration areas.

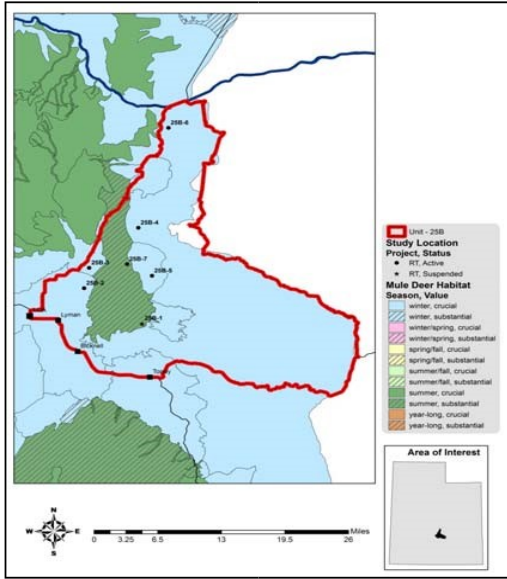
The unit has good winter range with ample protective cover, large basins, draws, and open ridges. The upper limits of the normal winter range vary from 8,400 feet at the northern boundary to 9,000 feet on the south end of the Thousand Lake Mountain. The lower normal winter range limit is between 6,000 and 7,400 feet in elevation. At present, the winter range appears ample to support the deer and elk from the Thousand Lakes unit and many wintering deer from the adjacent Fish Lake unit. Solomon Basin, Sage Flat, Horse Valley, Sand Flat, Paradise Flat, and Lyman Slopes are all winter concentration areas.

The condition of the spring and summer range is a current management concern. As the snow begins to recede in the spring, deer seek green grasses and forbs, which are very scarce on the overgrazed spring ranges. At this time, the early green-up in the alfalfa and grain fields on private land near Loa, Fremont, Lyman and Torrey are very attractive to wildlife and depredation becomes a problem.

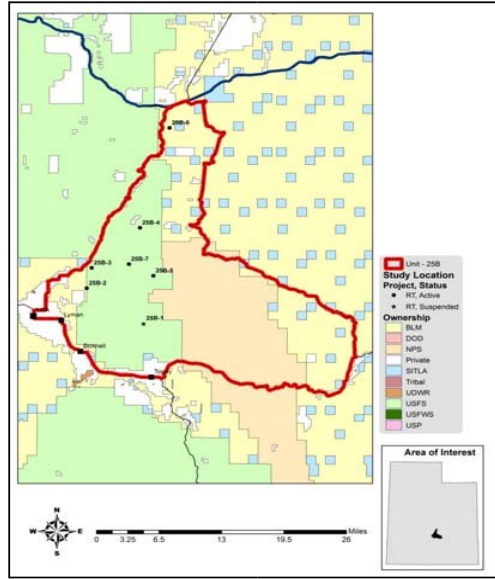
Limiting Factors to Big Game Habitat

One major management concern in this unit is the condition of the summer range. As the snow begins to recede in the spring, deer seek green grasses and forbs, which are very scarce on the overgrazed spring ranges. At this time, the early green-up in the alfalfa and grain fields on private land near Loa, Fremont, Lyman and Torrey are very attractive to wildlife and depredation becomes problematic.

Other limiting factors to big game include the encroachment of pinyon and juniper trees. According to the current LANDFIRE Existing Vegetation Coverage model, pinyon-juniper woodlands comprise nearly 22% of the unit. While these woodlands provide valuable escape and thermal cover for wildlife, encroachment and invasion into historic shrublands reduces available browse (Miller, Svejcar, & Rose, 2000), and may therefore influence the carrying capacity of the unit.



Map 2.3: Estimated mule deer habitat by season and value for WMU 25B.



Map 2.4: Land ownership for WMU 25B, Thousand Lake.

	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
Mule Deer	39,301	12%	275,351	88%
Elk	28,629	17%	144,217	83%

Table 2.2: Estimated mule deer and elk habitat acreage by season for WMU 25B, Thousand Lake.

Ownership	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
USFS	38,955	99%	65,673	24%
BLM	0	0%	82,550	30%
SITLA	0	0%	9,557	4%
Private	45	<1%	14,963	5%
NPS	301	<1%	102,609	37%
Total	39,301	100%	275,351	100%

Table 2.3: Estimated mule deer habitat acreage by season and ownership for WMU 25B, Thousand Lake.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Thousand Lakes Plateau management unit has fluctuated on the sites sampled since 1994. The active Range Trend sites sampled within the unit are considered to be in poor to fair condition as of the 2018 sample year (**Figure 2.2, Map 2.5**). The four studies considered to be in fair condition are Sage Flat, Polk Creek, Little Deer Peak, and Morrell Pond. The one site classified as being in poor condition is the Horse Valley study: a degenerate understory and lack of preferred browse young are the reasons that this site is considered to be in this condition.

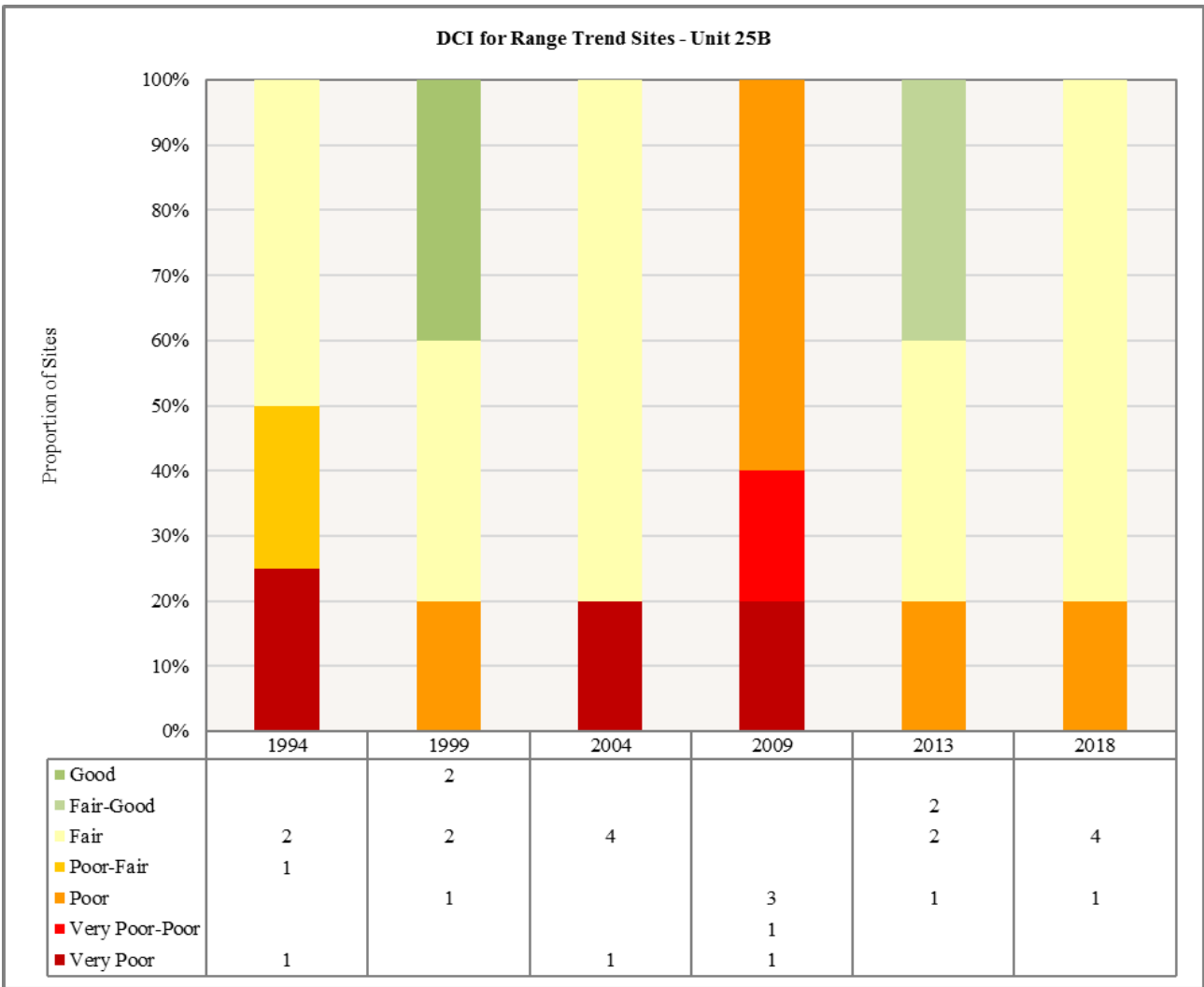
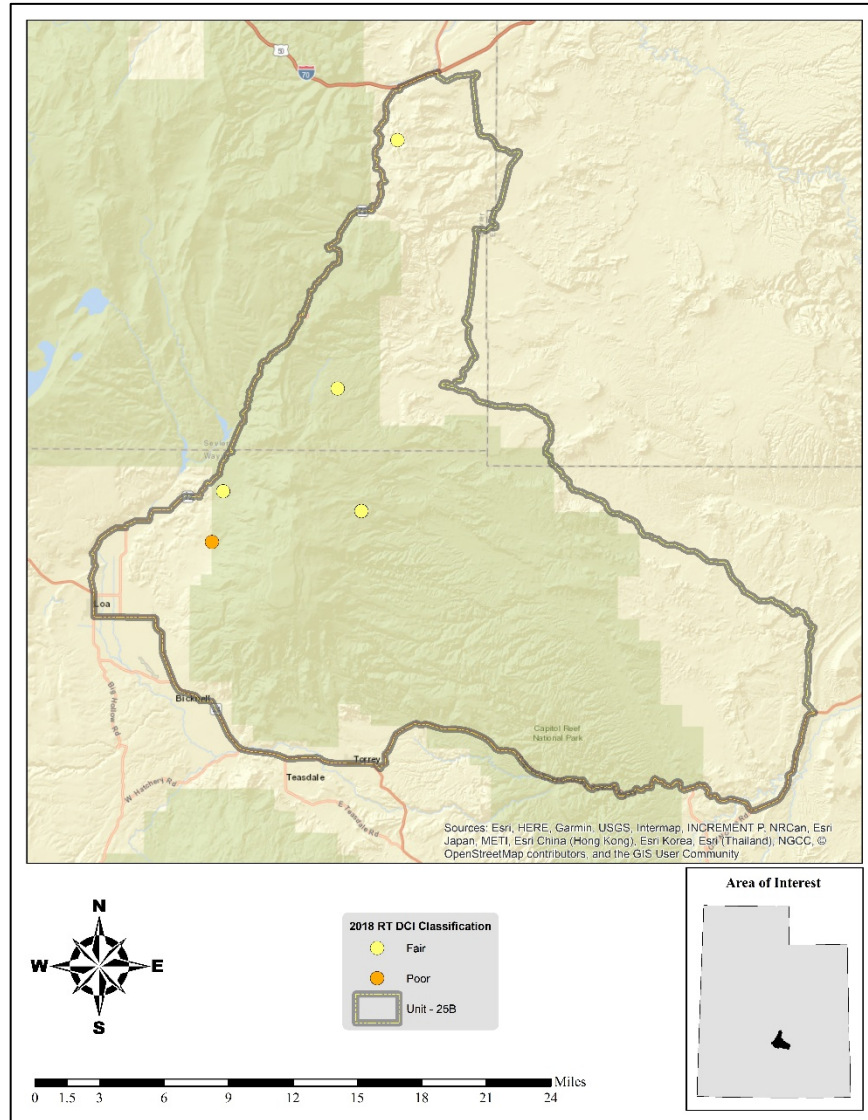


Figure 2.2: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 25B, Thousand Lakes Plateau.



Map 2.5: 2018 Desirable Components Index (DCI) ranking distribution by study site for WMU 25B, Thousand Lakes Plateau.

**Deer Herd Unit # 25C/26
(Plateau Boulder/Kaiparowits)**

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.

- Encourage vegetation manipulation projects and seeding to increase the availability, abundance and nutritional content of browse, grass, and forb species.

- Seek cooperative projects and programs to encourage and improve the quality and quantity of deer habitat, with public and private land managers to maintain a stable or upward trend in vegetative composition.
- Provide improved habitat security and escapement opportunities for mule deer keeping habitat restoration projects a priority for wildlife.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection, Improvement and Maintenance

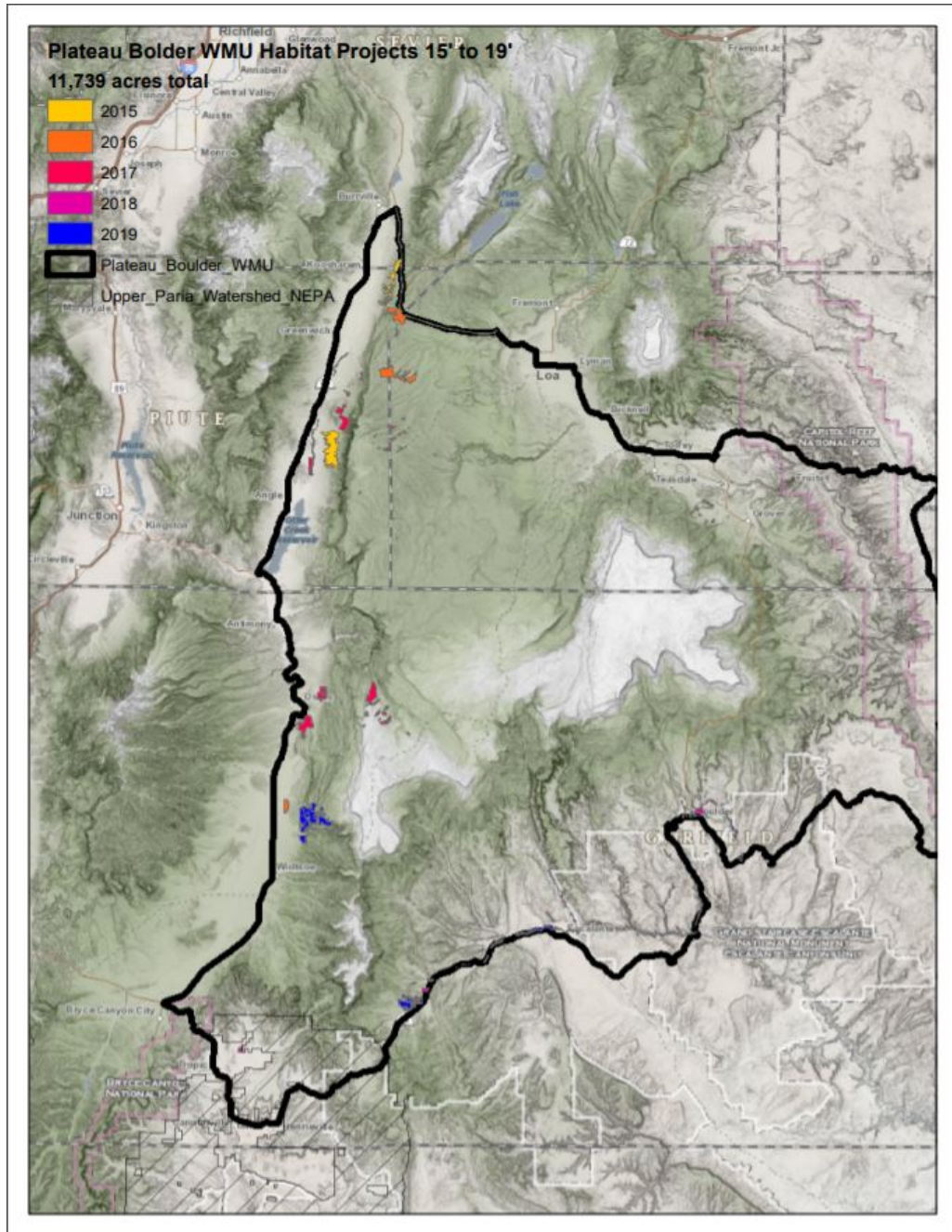
- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Continue to cooperate with Utah Department of Transportation (UDOT) and or Sportsman's groups to identify areas to mitigate and prevent deer-vehicle collisions to the extent possible.
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips.
- Reseed mechanical treatment areas with selected seed species that will out compete areas dominated by cheatgrass with desirable perennial vegetation focusing on seeding native grass species.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog and chaining projects.

- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Future habitat work should be concentrated on the following management priorities:
 - Increase browse species in critical winter range, and burned areas.
 - Increase critical winter range opportunities for mule deer.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit.
 - Continue to reduce threats to catastrophic wildfires, by reducing fuel loads and creating firebreaks.
 - When selecting and implementing habitat restoration projects, design and develop with wildlife benefit, including grass, forbs and shrubs for mule deer within the seed mixes.
 - Support enhancement and restoration efforts in Quaking Aspen forests unit wide by reducing encroachment of Spruce-Fir forests.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.

Treatments/Restoration Work There has been an active effort to address the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 16,400 acres of land have been treated within the Boulder Plateau subunit since the WRI was implemented in 2004 (**Map 3.1**). In addition, 564 acres are pending completion, 4,831 acres are currently being treated, and treatments are proposed for 1,020 acres. Treatments frequently overlap one another; bringing the total completed acres to 22,815 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Treatment Action	Acres
Anchor Chain	1,228
Bullhog	2,109
Harrow	6,652
Herbicide Application	390
Mowing	349
Prescribed Fire	1,900
Seeding (primary)	926
Hand Crew Vegetation Removal	5,192
Other	28
*Total Acres Treated	18,722
Total Treatment Acres	16,400

Table 3.1: WRI treatment size (acres. 2000-2018). *Majority of seeding was done in conjunction with wildfire restoration efforts. **Does not include overlapping treatments



Map 3.1: WRI treatments by Fiscal Year (2015-2019)

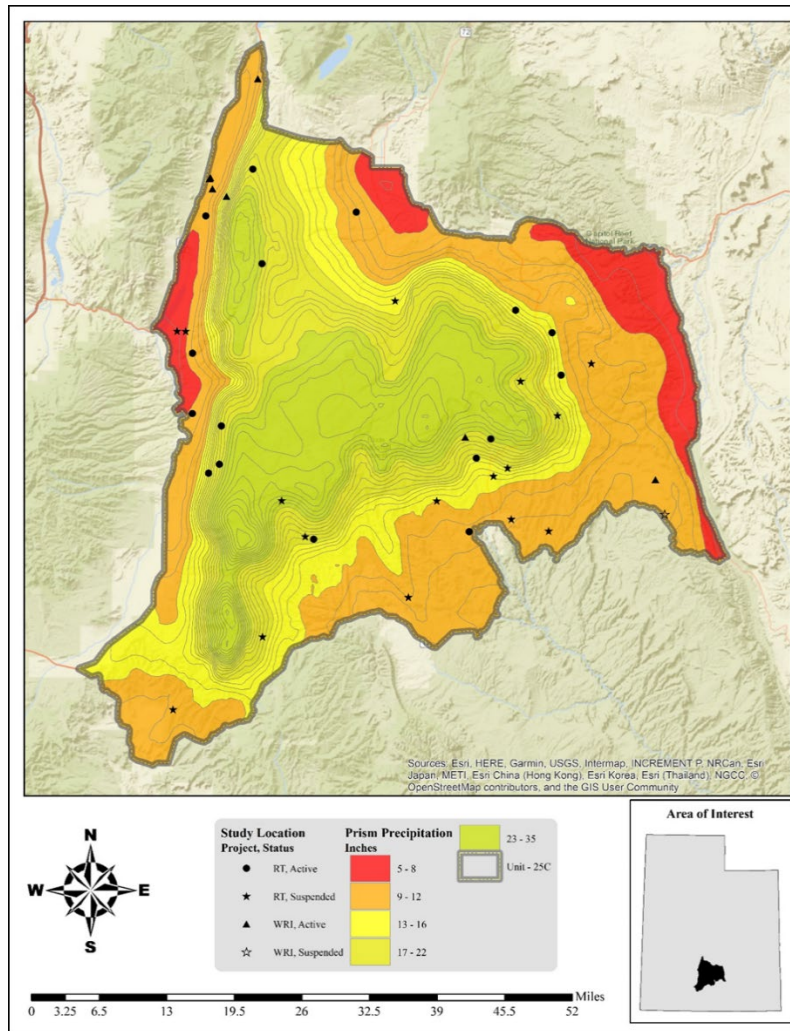
Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 7 inches along the eastern portions the unit and in Rabbit Valley to 32 inches on Barney Top in the Escalante Mountains. All of the

Range Trend and WRI monitoring studies on the unit occur within 9-23 inches of precipitation (**Map 3.2**) (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4).

The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, 2012-2014, and 2018. The mean annual PDSI displayed moderately to extremely wet years from 1983-1985, 1997-1998, 2005, and 2011 (**Figure 3.1a**). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2000, 2002-2004, 2013-2015, and 2018. Moderately to extremely wet years for this time period were displayed in 1983-1986, 1995, 1998-1999, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009, 2012, and 2018; moderately to extremely wet years were displayed in 1982-1985, 1997-1998, 2005, and 2011 (**Figure 3.1b**) (Time Series Data, 2019).



Map 3.2: The 1981-2010 PRISM Precipitation Model for WMU 25C, Boulder (PRISM Climate Group, Oregon State University, 2013)

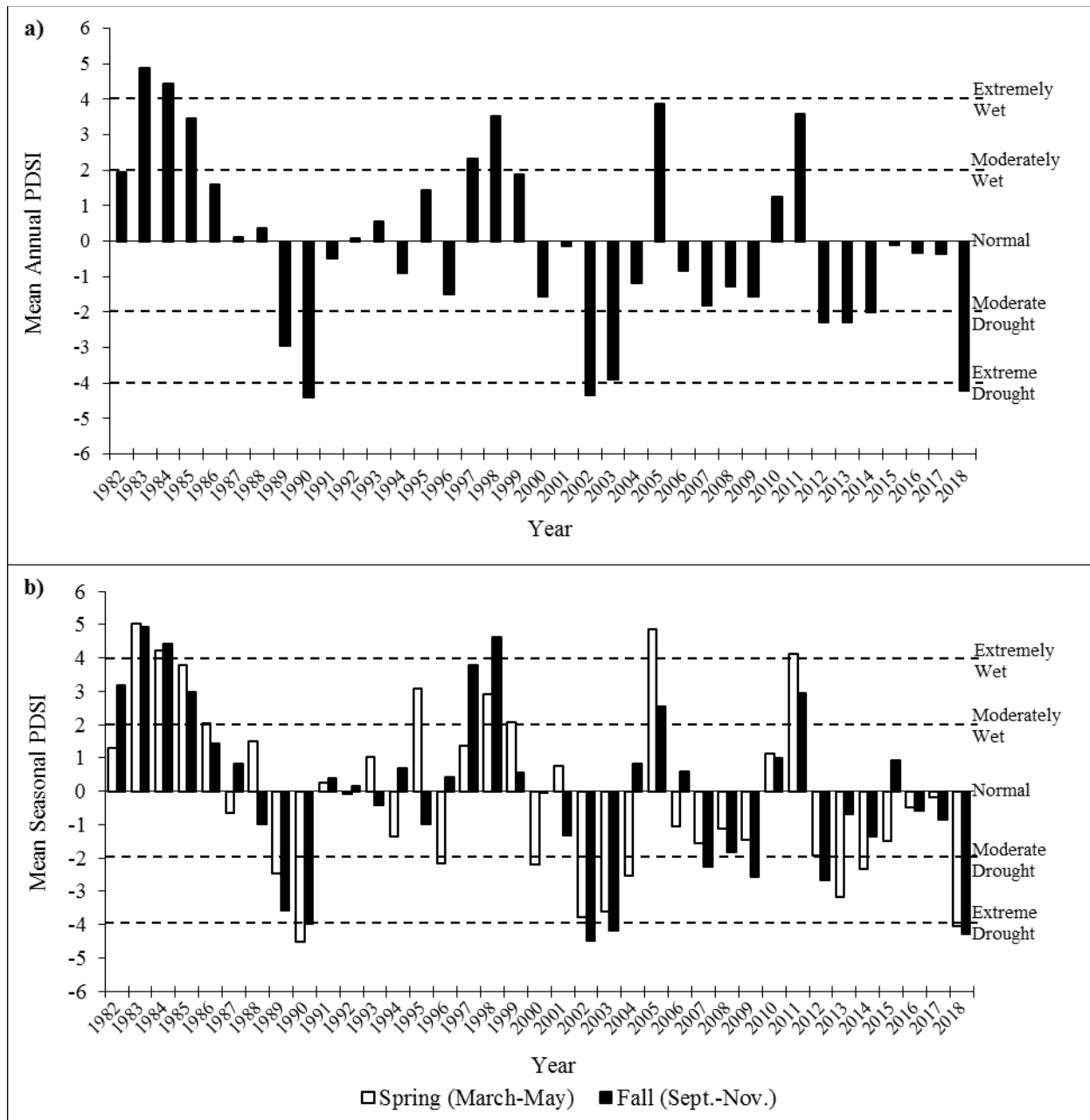


Figure 3.1: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).

Big Game Habitat

An estimated 1,337,035 acres are classified as deer range within Unit 25C with 62% classified as winter range, 38% as summer range, and less than 1% as year-long range (**Table 3.2, Map 3.3**). 42% of mule deer winter range is managed by the Bureau of Land Management (BLM), 28% is administered by the United States Forest Service (USFS), 11% is managed by the National Park Service (NPS), 10% is managed by the Utah School and Institutional Trust Lands

Administration (SITLA), 9% is privately held, and the Utah Department of Transportation (UDOT), Utah Division of Wildlife Resources (UDWR), and Utah State Parks (USP) each manage less than 1% (**Table 3.3, Map 3.3, Map 3.4**).

The winter range is large enough to support all of the deer summering on the unit. With a few localized exceptions, it is in mostly good condition. Huff & Coles (1966) drew the upper limits of the winter range between 8,000 and 8,400 feet and the lower limits between 6,500 and 7,000 feet. The pinyon-juniper and sagebrush types with various combinations of the two dominate the winter range. South of Boulder Mountain, there is abundant winter range. However, much of the country is slickrock canyons and mesas that support few deer. Most wintering takes place on the lower slopes and at the base of the mountain. The upper limits of the normal winter range are uniform at 8,000 feet across the south slopes of the Boulder Mountain. Seven thousand feet is the usual upper limit during severe winter conditions. The lower limit for most wintering deer on the south side of the unit is Highway 12. On the west side of the Aquarius Plateau between Antimony and Widtsoe, winter range is more restricted. The mountain drops off steeply from Griffin Top to the river valley. Deer can typically utilize vegetation up to 9,000 feet during normal winters, but are limited to an upper limit of around 8,000 feet during severe winters. The lower boundary for severe winters is the bottom of the valley on the Sevier River, which is approximately 6,500 feet in elevation.

Summer range is limited to specific areas on Parker Mountain and Boulder Mountain. Boulder Mountain contains approximately 50,000 acres above 10,500 feet (Christensen & Bogedahl, 1983). This high summer range is unsuitable for fawning and receives only light deer use in late summer. Most fawning and summer use is concentrated underneath the lava rock rim where stands of aspen, fir, and spruce are interspersed with sage flats and meadows. Because of fire suppression, the trend is toward a denser spruce climax community. Logging and/or prescribed burns may help maintain this important habitat in a seral stage, which is more productive and more favorable to big game. Lower down the slopes, ponderosa pine (*Pinus ponderosa*) with its associated mountain brush understory receives limited summer use. Summer range on Parker Mountain is more limited to the higher southern end, where aspen stands in association with big sagebrush and antelope bitterbrush provide excellent fawning areas.

Limiting Factors to Big Game Habitat

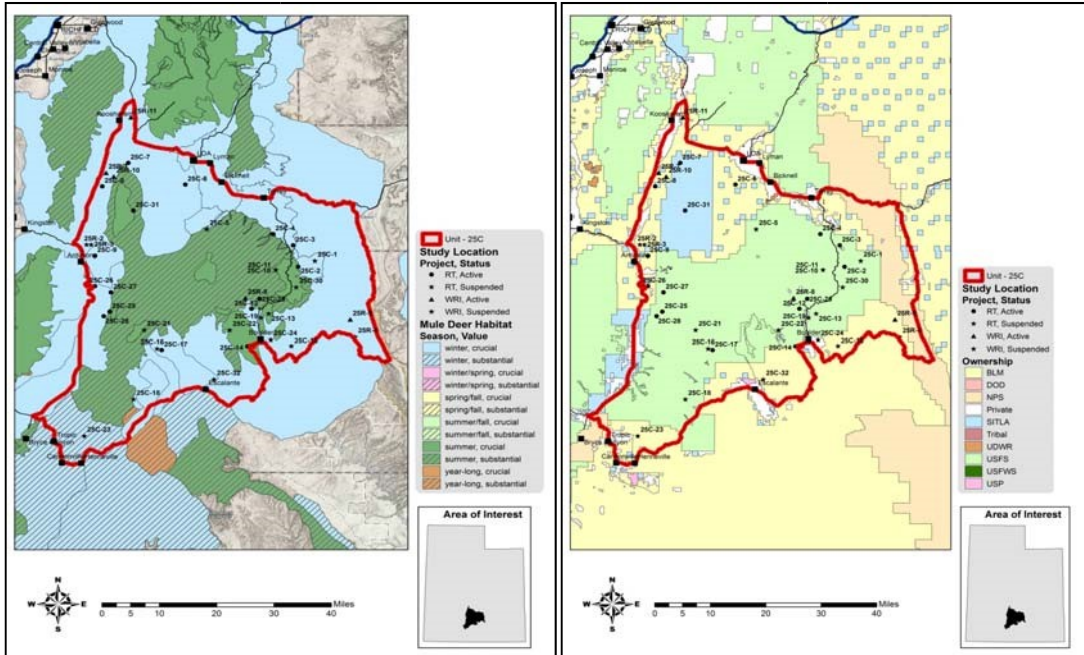
The Boulder Plateau and the surrounding winter range have a wide variety of multiple uses that stem from a diverse range of landownership and land management principles. Private land practices mainly include ranching and alfalfa production, while state and federal land uses include livestock grazing, mineral and resource exploration and extraction, road building, OHV riding, camping, and wilderness designations. Many of the land uses within the unit can be harmonious with the management of big game habitat, but other land practices may negatively affect its management within the unit. There is ample range for deer in normal winters, and it is only in severe winters that the usable range may become limited. In addition, the potential to increase forage for wintering deer and elk is substantial and can be gained by the removal of encroached pinyon and juniper trees that are very pronounced along benches and flats of the Boulder Plateau.

The current LANDFIRE Existing Vegetation Coverage model shows that nearly 27% of this unit is comprised of pinyon and juniper stands. While pinyon-juniper woodlands may provide valuable thermal cover, encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease the sagebrush and herbaceous components, therefore decreasing the available forage for wildlife (Miller, Svejcar, & Rose, 2000).

Wildfire has not substantially impacted the deer winter range within this unit. In addition, few of the range trend studies have captured wildfire events: as such, any responses to rehabilitation efforts or recovery of sagebrush communities within the fire perimeters since the year 2000 have not been evaluated.

Encroachment by pinyon-juniper woodland communities also poses a substantial threat to important sagebrush rangelands. Pinyon-juniper woodlands dominate the vegetation coverage within the deer winter range on WMU 25C. Encroachment and invasion of these woodlands into sagebrush communities

has been shown to decrease the sagebrush and herbaceous components, and therefore decreases available forage for wildlife (Miller, Svejcar, & Rose, 2000).



Map 3.3: Estimated mule deer habitat by season and value

Map 3.4: Land ownership for WMU 25C.

Summer Range		Winter Range		Year Long Range	
Area (acres)	%	Area (acres)	%	Area (acres)	%
505,941	38%	828,523	62%	2,571	<1%

Table 3.2: Estimated mule deer habitat acreage by season for WMU 25C, Boulder Plateau.

Ownership	Summer Range		Winter Range		Year Long Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
BLM	21,870	4%	347,683	42%	0	0%
Private	2,634	1%	75,859	9%	10	<1%
SITLA	52,594	10%	84,317	10%	0	0%
USFS	428,843	85%	227,979	28%	2,561	100%
UDOT	0	0%	151	<1%	0	0%
USP	0	0%	1,391	<1%	0	0%
UDWR	0	0%	1,110	<1%	0	0%
NPS	0	0%	90,034	11%	0	0%
Total	505,941	100%	828,523	100%	2,571	100%

Table 3.3: Estimated mule deer habitat acreage by season and ownership for WMU 25C, Boulder Plateau.

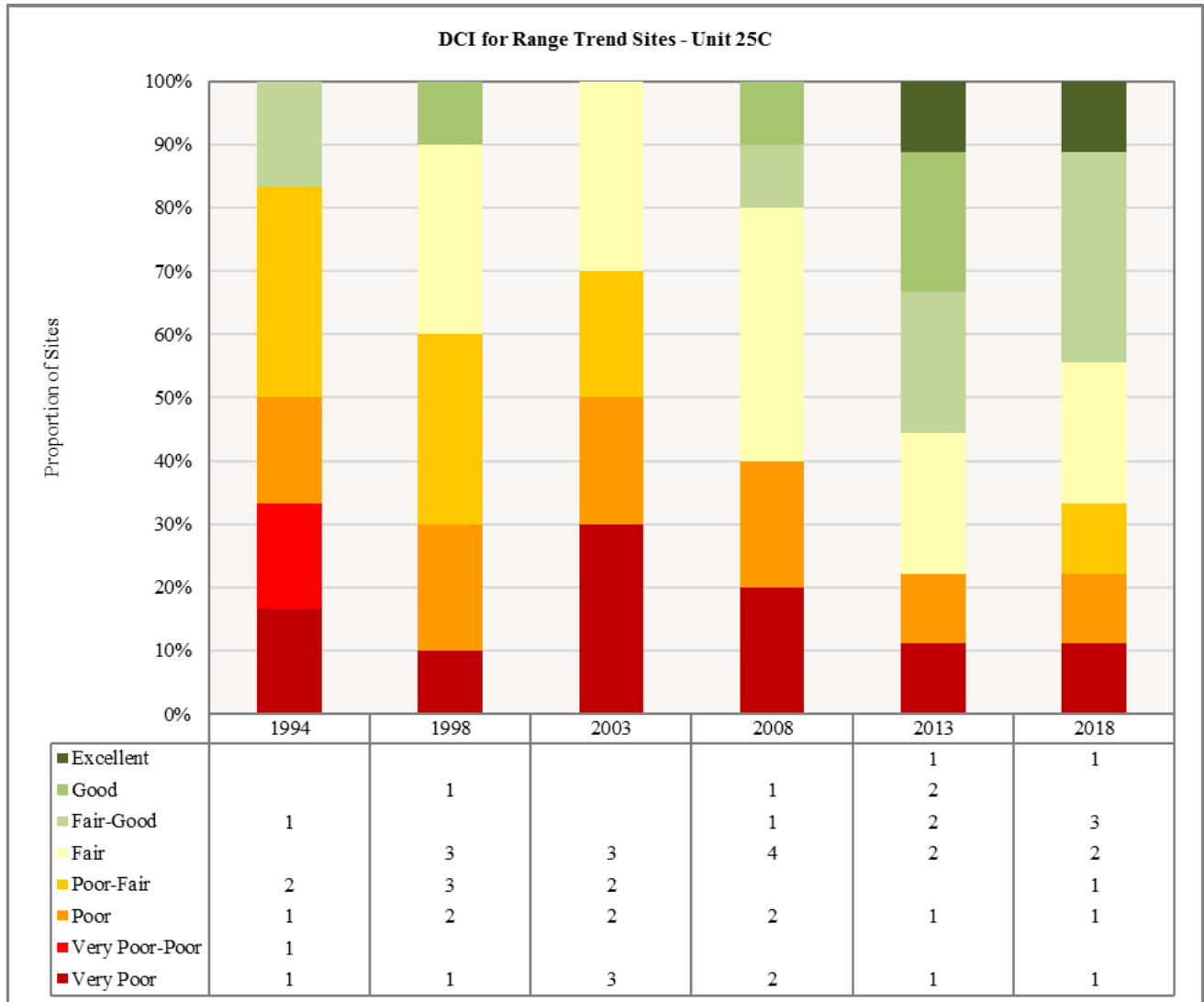
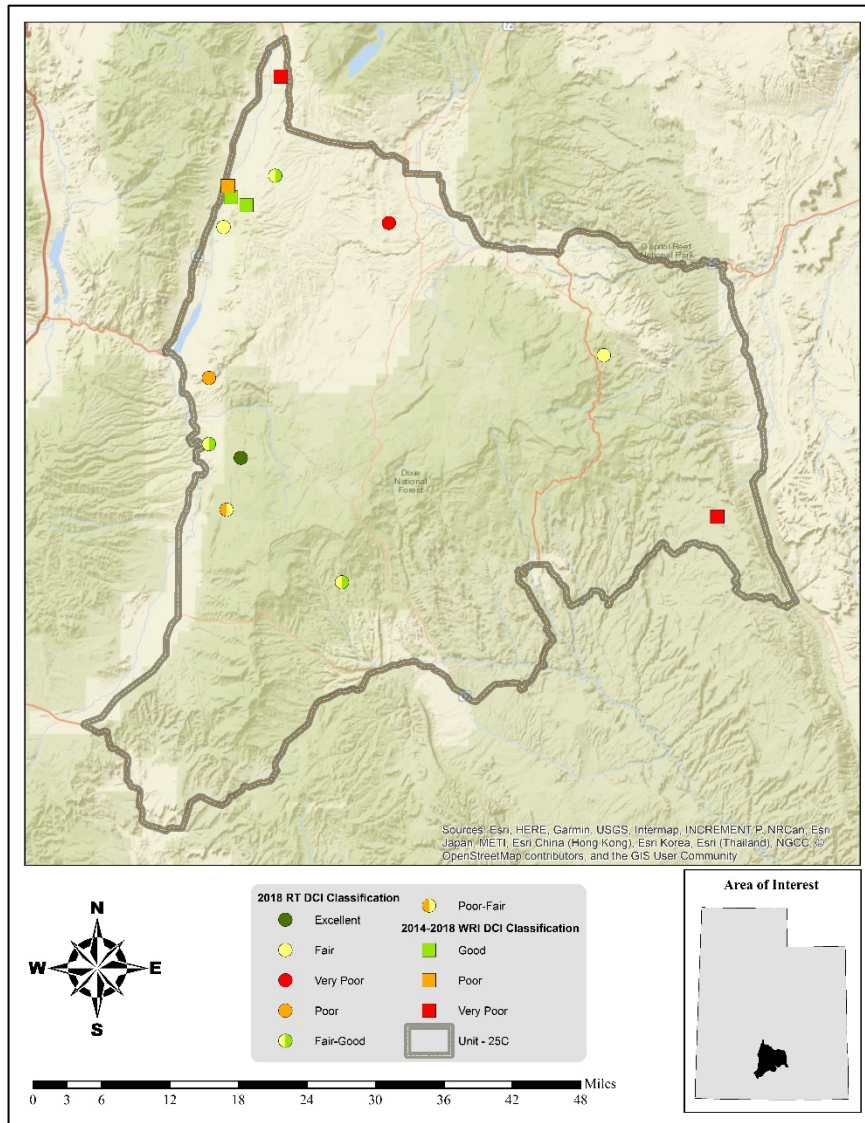


Figure 3.2: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 25C, Boulder Plateau.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Boulder Plateau management unit has shown variation on the sites sampled since 1994. The active Range Trend sites sampled within the unit are considered to be in very poor to excellent condition as of the 2018 sample year (**Figure 3.2**). The Poison Creek Bench study is the only site that is considered to be in excellent condition: high amounts of preferred browse as well as perennial grasses and forbs contribute to this ranking. There are three studies considered to be in fair-good condition, and these sites are Cedar Grove, Varney-Griffin Chaining, and Black Canyon. There are two studies classified as being in fair condition: Happy Valley and South Narrows. The site ranked as being in poor-fair condition is the North Creek study. There is one study in poor condition, and this study is the Dry Wash site. Finally, there is one study considered to be in very poor condition which is the Terza Flat study. This study is considered to be in this condition because of a lack of preferred browse as well as a lack of understory plants.



Map 3.5: 2018 Desirable Components Index (DCI) ranking distribution by study site for WMU 25C, Boulder Plateau.

Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

APPENDIX

Unit 25a Plateau, Fishlake Subunit

Sevier, Piute, and Wayne counties - Boundary begins at SR-24 and US-89 at Sigurd; south on SR-24 to SR-72 at Loa; north on SR-72 to I-70; west on I-70 to US-89; south on US-89 to SR-24.

Unit 25b Plateau, Thousand Lake Subunit

Sevier, and Wayne counties - Boundary begins at the junction of SR-24 and SR-72 at Loa; southeast on SR-24 to the Cainville Wash road; north on the Cainville Wash road to the junction of I-70 and SR-72; south on SR-72 to SR-24 at Loa.

Unit 25c Plateau, Boulder Subunit

Garfield, Piute, and Wayne counties - Boundary begins at SR-24 and SR-62; south on SR-62 to SR-22; south on SR-22 to the Antimony-Widtsoe road; south on the Antimony-Widtsoe road to SR-12; east on SR-12 to the Burr Trail at Boulder; east on the Burr Trail road to the Notom Road; north on the Notom Road to SR-24; west on SR-24 to SR-62.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 27
Paunsaugunt
2020

BOUNDARY DESCRIPTION

Garfield and Kane counties - Boundary begins at US-89A and the Utah-Arizona state line; north on US-89A to US-89; north on US-89 to SR-12; east on SR-12 to the Paria River; south along the Paria River to the Utah-Arizona state line; west along this state line to US-89A.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

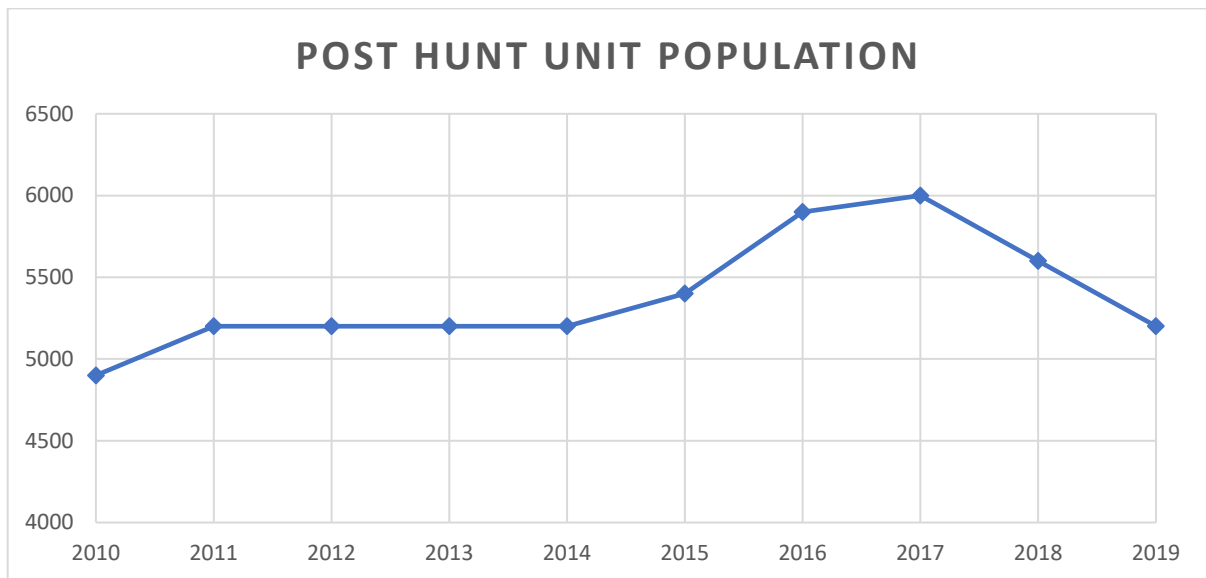
Ownership	YEARLONG RANGE		SUMMER RANGE		WINTER RANGE		TOTAL ACRES
	Area (acres)	%	Area (acres)	%	Area (acres)	%	
Forest Service	0	0%	122705	37%	8279	1%	130984
Bureau of Land Management	0	0%	76806	23%	502742	85%	579548
Utah State Institutional Trust Lands	0	0%	19551	6%	14011	2%	33562
Native American Trust Lands	0	0%	0	0%	0	0%	0
Private	0	0%	93122	28%	48189	8%	141311
Department of Defense	0	0%	0	0%	0	0%	0
USFWS Refuge	0	0%	0	0%	0	0%	0
National Parks	0	0%	17658	6%	15098	3%	32756
BLM Wilderness Area	0	0%	0	0%	3269	1%	3269
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%	0
TOTAL	0	0%	329841	100%	591587	100%	921430

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.
- Continue with limited entry hunting. Maintain cooperative DWR/landowner relationships, i.e. Paunsaugunt Landowners Association and Alton Cooperative Wildlife Management Unit.

POPULATION MANAGEMENT OBJECTIVES

- Target Winter Herd Size - Manage for a 5-year target population of 6,500 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. There is no change from the 2015 plan. The 10-year average population estimate is 5,400. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.
- Herd Composition - The Paunsaugunt unit will be managed for a post-season buck to doe ratio for a 3-year average of **40–55** bucks/100D does. Continue to provide management buck hunts to provide additional hunting opportunity with a minimum of 10 permits. The definition of a management buck on the Paunsaugunt will be consistent with the definition provided in the statewide plan for premium limited entry units.
- Buck Harvest - In accordance with the state-wide mule deer management plan, baseline premium limited entry permits for the public draw will be recommended at current levels (2019) on the Paunsaugunt. If <40% of the harvested bucks (3-year average) are 5 years of age or older, premium limited entry permits will be recommended to be reduced as needed to achieve objective. If >40% of harvested bucks (3-year average) are 5 years of age or older, premium limited entry permits will be recommended at the baseline number.
- If the 3-year average buck:doe ratio exceeds 50/100, management buck permits will be increased to bring the population back to objective within 3 years.
- Provide cactus buck hunting opportunities if needed.



POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Herd composition and population size will be monitored through computer modeling using data collected during post-season classification, hunter check stations, and hunter harvest surveys.

- Buck Age Structure - The age class structure of the harvest will be monitored through the submission of an incisor (tooth) from each buck harvested on the unit. Additional data on the age class structure of the population may be obtained through post-season classification, uniform harvest surveys and field bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide mandatory harvest survey. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck: doe ratios and the age objective for premium limited entry units.
- On appropriate limited entry and premium limited entry units, provide a multi-season hunting opportunity that will allow 3% of the hunters to hunt all seasons for an increased fee. The permits this hunt will be removed from the any weapon quota.

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation -Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- Habitat - Based on 2018 DWR range trend study data, the general condition of deer winter range on the Paunsaugunt unit continues to decline. Range condition on 10 of the 13 winter range sites was rated as either poor or very poor with only the higher elevation Moon landing and Heaton sites rating good or excellent. Range condition worsened on 6 sites between 2003 and 2018, with the Buckskin Mountain study showing the greatest decline resulting from loss of sagebrush combined with an increasing amount of annuals such as cheatgrass. Range condition did improve slightly on two winter range study sites: Nephi Pasture I, and Five-mile Mountain. The Moon Landing and Heaton studies also showed improvement, but these sites are more characteristic of higher elevation transitional range.
- Predation - Follow DWR predator management policy.
 - Predator management may be conducted with assistance from USDA/Wildlife Services. To be most effective, control efforts should generally occur during and immediately prior to the fawning period.
 - Public hunting will be the primary means of managing cougar numbers on the Paunsaugunt unit. Harvest recommendations for cougar will be designed to benefit deer while maintaining the cougar as a valued resource in its own right.
- Highway Mortality - Continue to work with the Utah Department of Transportation in construction of highway fences, passage structures and warning signs etc.
 - In 2013 Utah Department of Transportation and Utah Division of Wildlife Resources worked together with multiple partners to create 12.5 miles of wildlife exclusion fencing (8 feet tall) from mile posts 36 in the east to 48.6 in the west, and three new wildlife crossing culverts along US 89 in the Grand Staircase Escalante National Monument. The goal of the project was to funnel the Paunsaugunt mule deer herd through these three new culverts and three existing culverts and one bridge in their movements north and south, and thus reduce mule deer-vehicle collisions along this stretch of road. A significant reduction in highway mortalities have been observed since the fence and crossings were installed.

Additionally, multiple illuminated warning signs have been placed along US89 in Garfield and Kane Counties.
- Illegal Harvest - If illegal harvest is identified as a significant source of mortality, an attempt to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement Section.

- Cooperative Management - Approximately 25-30% of deer that summer on the Paunsaugunt Unit migrate south across the Utah/Arizona border to winter in Arizona. Continue cooperative program with Arizona Game and Fish Department for mutual harvest objectives.

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Seek cooperative projects to improve the quality and quantity of deer habitat.
- Provide improved habitat security and escapement opportunities for deer.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Work with land management agencies to evaluate and develop motorized travel plans to reduce disturbance during times of high stress, such as winter and fawning.

Habitat Improvement

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding wildfire areas, creating fuel breaks and vegetated green strips and reseed areas dominated by Cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Cooperate with federal land management agencies and private land owners in carrying out aspen

regeneration and habitat improvement project.

- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Future habitat work should be concentrated on the following areas.
 - Continue to reduce Pinyon and Juniper encroaching into shrubland, specifically on Hatch Bench, Buckskin, Kanab Creek, Thompson creek and other areas in critical winter range.
 - Seek opportunities within upper elevation aspen habitats to remove encroaching conifer and implement aspen rejuvenation projects.
 - Seek opportunities to increase browse, perennial grasses and forbs and reduce annual invasive grasses in areas of critical winter; specifically on the Buckskin.

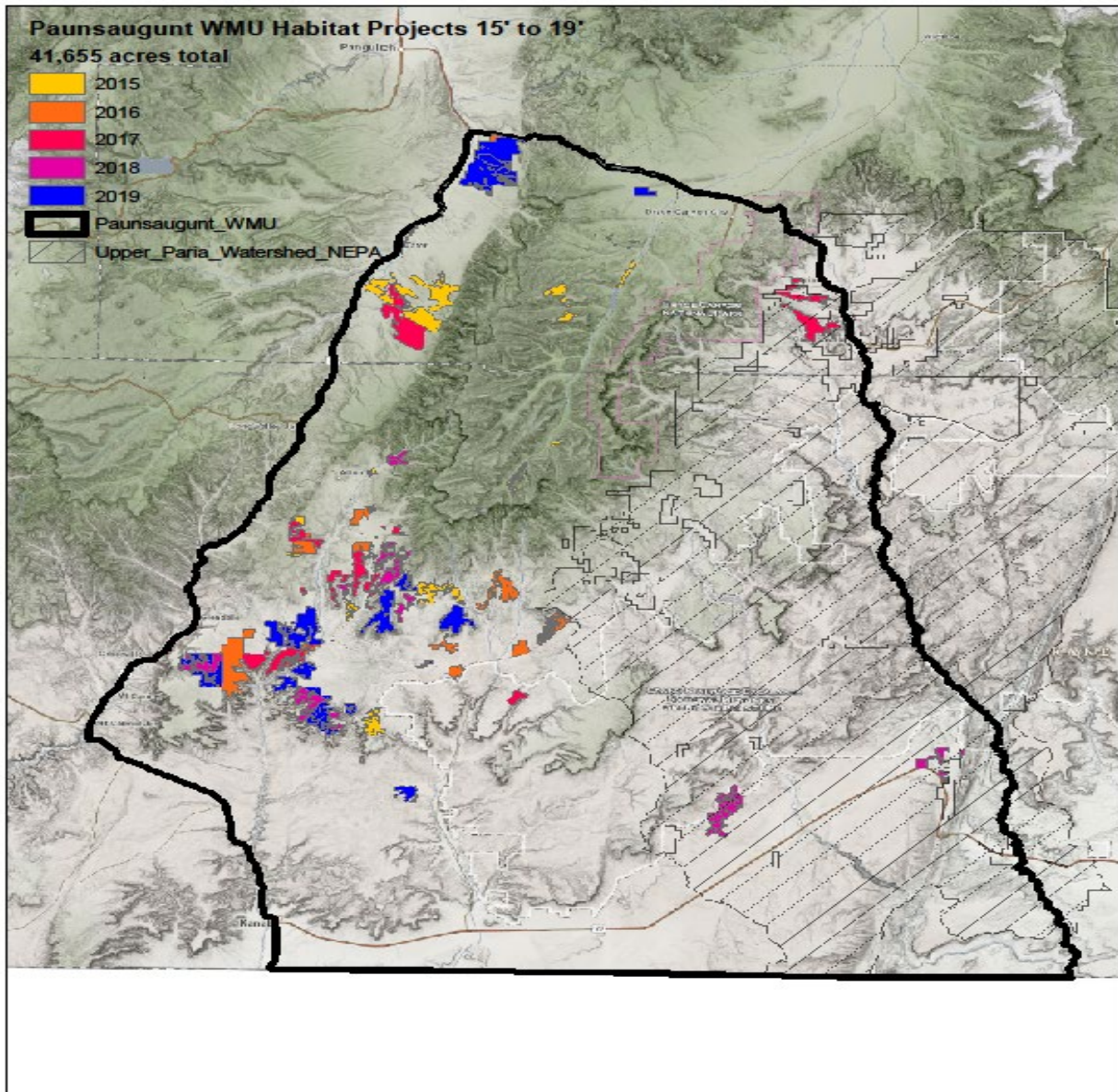
Treatments and Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 65,021 acres have been treated within the Paunsaugunt unit since the WRI was implemented in 2018. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

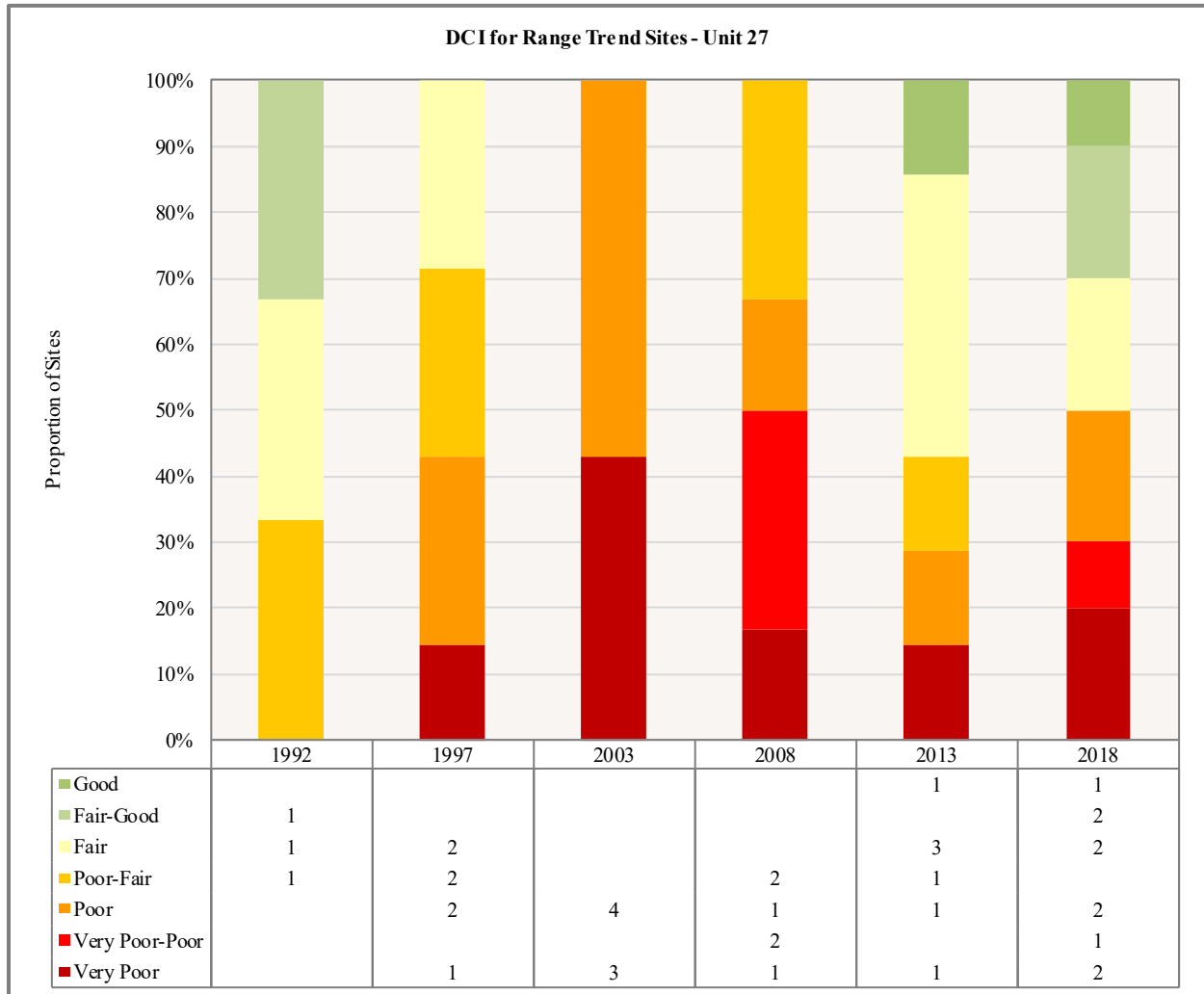
Type	Completed Acreage	Current Acreage	Pending Completed Acreage	Proposed Acreage	Total Acreage
Anchor chain	12,312	1,566	0	0	13,878
Ely (One-Way)	3,224	0	0	0	3,224
Ely (Two-Way)	8,790	1,566	0	0	10,356
Smooth (Two-Way)	298	0	0	0	298
Bulldozing	911	0	0	0	911
Tree Push	911	0	0	0	911
Bullhog	16,299	1,910	620	2,848	21,677
Full Size	13,679	1,910	620	2,848	19,057
Skid Steer	2,620	0	0	0	2,620
Chain Harrow	0	0	0	152	152
≤15 ft. (Two-Way)	0	0	0	152	152
Disc	1,834	0	0	0	1,834
Plow (One-Way)	1,038	0	0	0	1,038
Off-set (Two-Way)	796	0	0	0	796
Forestry Practices	68	2,205	0	0	2,273
Coppice Cutting	0	264	0	0	264
Group Selection Cuts	24	255	0	0	279
Thinning (Commercial)	44	260	0	0	304
Thinning (Non-Commercial)	0	1,426	0	0	1,426
Harrow	4,100	0	0	628	4,728
≤15 ft. (One-Way)	3,588	0	0	628	4,216
≤15 ft. (Two-Way)	512	0	0	0	512
Herbicide Application	14	0	0	237	251
Ground	14	0	0	0	14
Aerial (Fixed-Wing)	0	0	0	237	237
Mowing	1,609	357	0	94	2,060
Brush Hog	0	0	0	23	23
Other	1,609	357	0	71	2,037
Prescribed Fire	1,477	0	0	0	1,477
Seeding (Primary)	3,854	1,554	0	0	5,408
Broadcast (Aerial-Fixed Wing)	2,396	1,291	0	0	3,687
Drill (Rangeland)	1,219	0	0	0	1,219
Ground (Mechanical Application)	220	263	0	0	483
Hand Seeding	19	0	0	0	19
Seeding (Secondary/Shrub)	1,248	0	0	1,353	2,601
Broadcast (Aerial-Fixed Wing)	90	0	0	0	90
Ground (Mechanical Application)	1,158	0	0	0	1,158
Hand Seeding	0	0	0	1,353	1,353
Skid-Steer Mounted Tree Cutter	1,018	0	0	0	1,018
Hydraulic Shears	1,018	0	0	0	1,018

Vegetation Removal/Hand Crew	25,962	3,764	0	7,793	37,519
Lop & Scatter	25,320	3,764	0	7,793	36,877
Lop-Pile-Burn	642	0	0	0	642
Other	482	0	0	0	482
Road Decommissioning	482	0	0	0	482
Grand Total	71,188	11,356	620	13,105	96,269
* Total Land Area Treated	59,562	11,119	620	13,089	84,390

Table 6.7



PERMANENT RANGE TREND SUMMARIES



Unit 27 Paunsaugunt

The condition of deer winter range within the Paunsaugunt management unit has generally decreased from 1997/98-2008, but improved in 2013. The majority of sites sampled within the unit are considered to be in fair to good condition based on the most current sample data, and the proportion of sites classified as being in poor or very poor condition has decreased since 2008 (see figures below). The two undisturbed studies that are currently considered to be in poor condition are the Nephi Pasture Total Exclosure and Mustang Pond studies, which have a marginal herbaceous understory, but have fair browse components. The condition of disturbed and treated sites typically improves with increased time after disturbance on this unit with the exception of sites, which burned in wildfire. The majority of disturbed or treated study sites ranked as being in poor or very poor condition 1-5 years after disturbance are those burned by wildfire or had depleted shrub understory. These study sites generally are still lacking in available browse species

The high elevation aspen site, which was established to monitor an aspen improvement project, is in poor condition. Even though only one site monitors this community type, it has been observed that conifer encroachment is affecting the aspen community on the Paunsaugunt Plateau with aspen being severely encroached. The herbaceous and shrub layers are in poor condition and provide little cover. It is recommended that work to remove conifer from aspen stand should continue in these communities.

The higher elevation mountain sites, which support basin big sagebrush communities, are generally considered to be in good condition for deer winter range habitat on the Paunsaugunt management unit. This community support robust shrub population that provide valuable browse in mild winters, and good herbaceous and browse community during transitional and summer months. While in generally good condition, these sites appear to be prone to encroachment from pinyon and juniper trees, which can reduce understory shrub and herbaceous health if not addressed. It is recommended that work to reduce pinyon-juniper encroachment (e.g. bullhog, chaining, lop and scatter, etc.) should continue in these communities.

The mid elevation sites which support basin big sagebrush communities are generally considered to be in good condition for deer winter range habitat on the Paunsaugunt management unit. These communities support robust shrub populations that provide valuable browse in mild and moderate winters. While in generally good condition, these sites appear to be prone to encroachment from pinyon-juniper trees. On many of these sites, pinyon and juniper have increased in cover and density over the sampled years. It is recommended that work to reduce pinyon-juniper encroachment (e.g. bullhog, chaining, lop and scatter, etc.) should continue in these communities. When reseeding is necessary to restore herbaceous The mid elevation upland cliffrose communities that have not been disturbed are generally considered to be in fair condition for deer winter range habitat on the unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters. However, these communities are prone to wildfire and those studies, which have burned since 2006, are typically in poor to very poor condition. If wildfires occur within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. These communities are prone to encroachment from pinyon-juniper trees, which can reduce understory shrub and herbaceous health if not addressed. Annual grass, primarily cheatgrass, can also be an issue within these communities. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire within these communities. It is recommended that work to reduce pinyon-juniper encroachment should continue in these communities. Care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites. Work to diminish fuel loads and create firebreaks should continue in order to reduce the threat of catastrophic fire.

The lower elevation semidesert Wyoming big sagebrush and black sagebrush communities are generally considered to be in fair condition for deer winter range habitat on the unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters. However, these communities are prone to wildfire and if wildfires occur within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. These communities are susceptible to invasion from annual grass, primarily cheatgrass. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire on within these communities. These communities are prone to encroachment from pinyon-juniper trees, which can reduce understory shrub and herbaceous health if not addressed. Treatments to establish and increase browse species more rapidly following wildfire should also be implemented, and treatments to increase browse species on historic fires should be considered. If a treatment to rejuvenate sagebrush occurs, care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites.

Precipitation

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2020. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011 (Figure 6.1a). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and 2013; and displayed years of moderate to extreme wet years in 1982-1985, 1993, 1995, 1999, 2001, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009 and 2012; and displayed years of moderate to extreme wet years in 1982-1985, 1997-1998, 2008 and 2011 (Figure 6.1b) (Time Series Data, 2018)

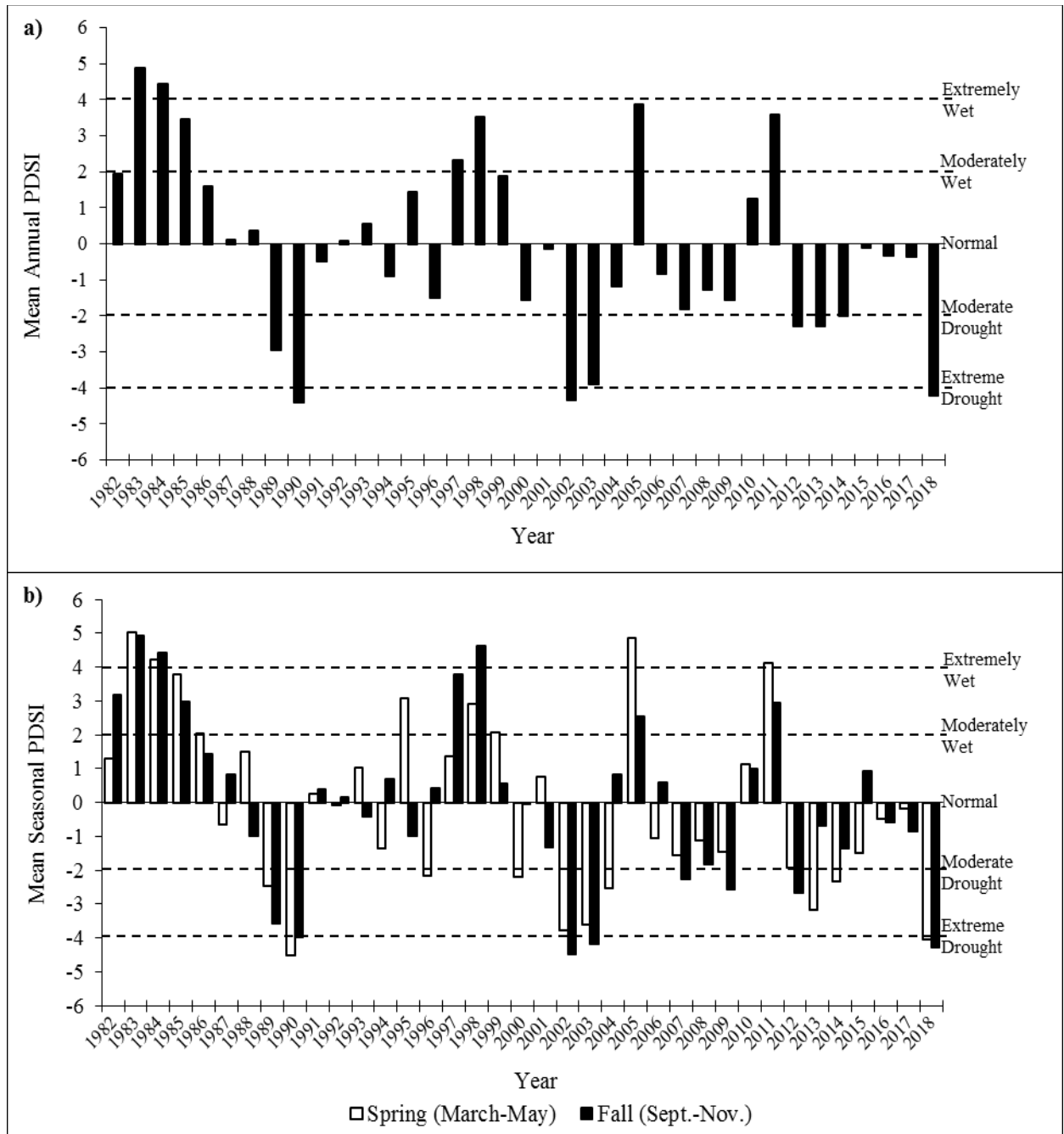
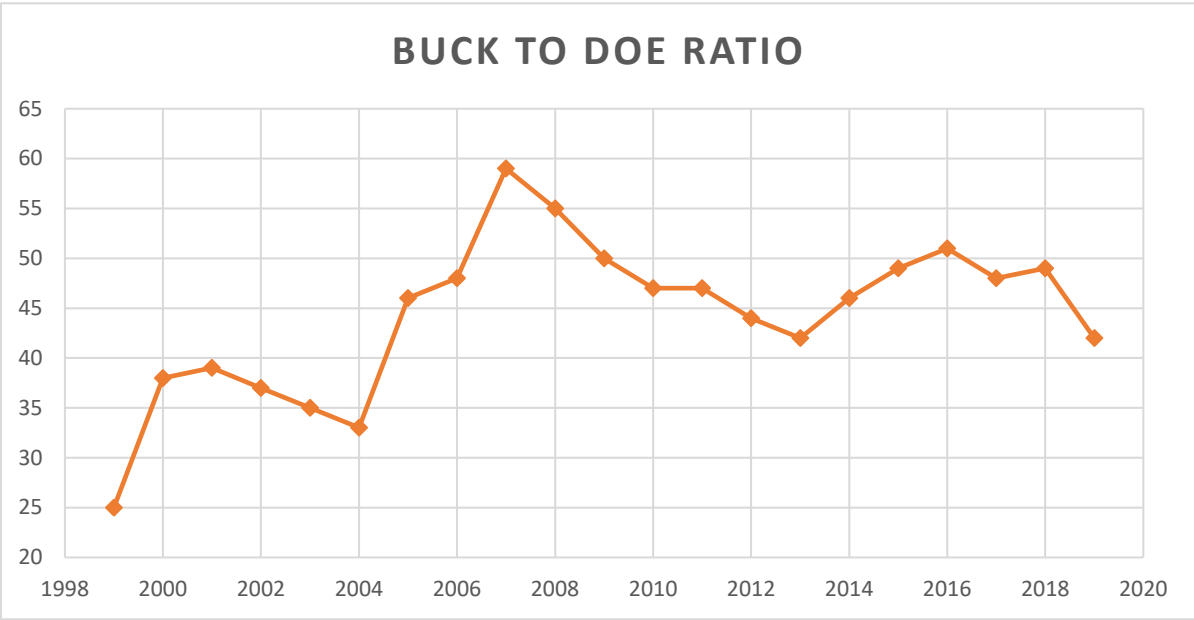
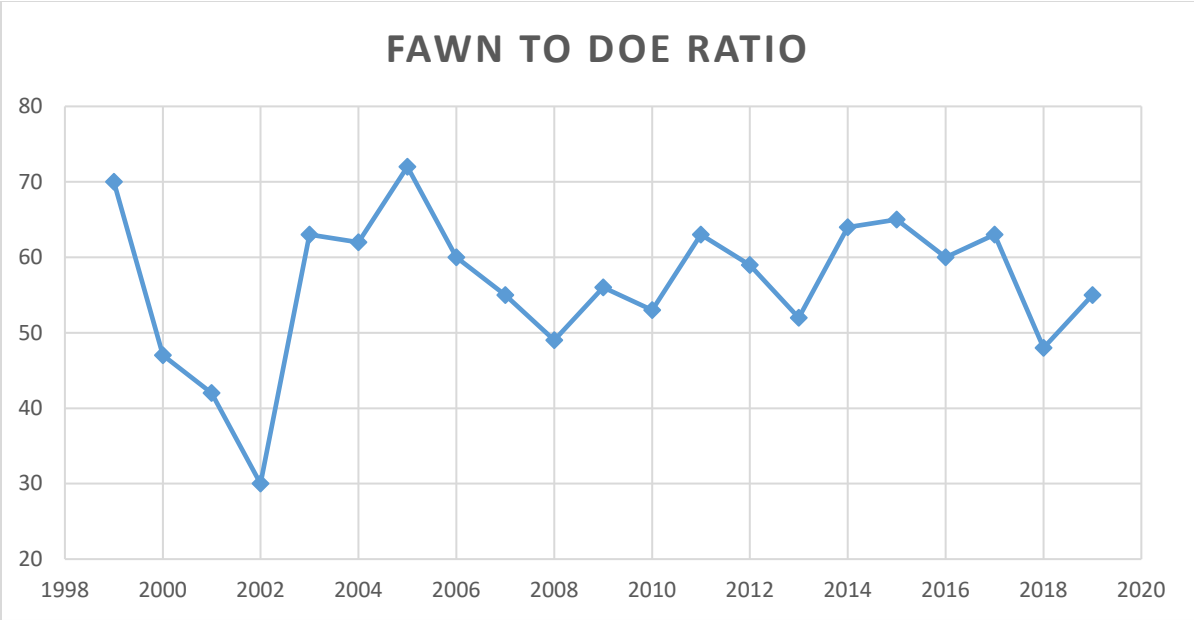


Figure 6.1: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).



Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 28
Panguitch Lake
2020

BOUNDARY DESCRIPTION

Garfield, Iron and Kane Counties - Boundary begins SR-14 and US-89; north on US-89 to SR-20; west on SR-20 to I-15; south on I-15 to SR-14; east on SR-14 to US-89.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

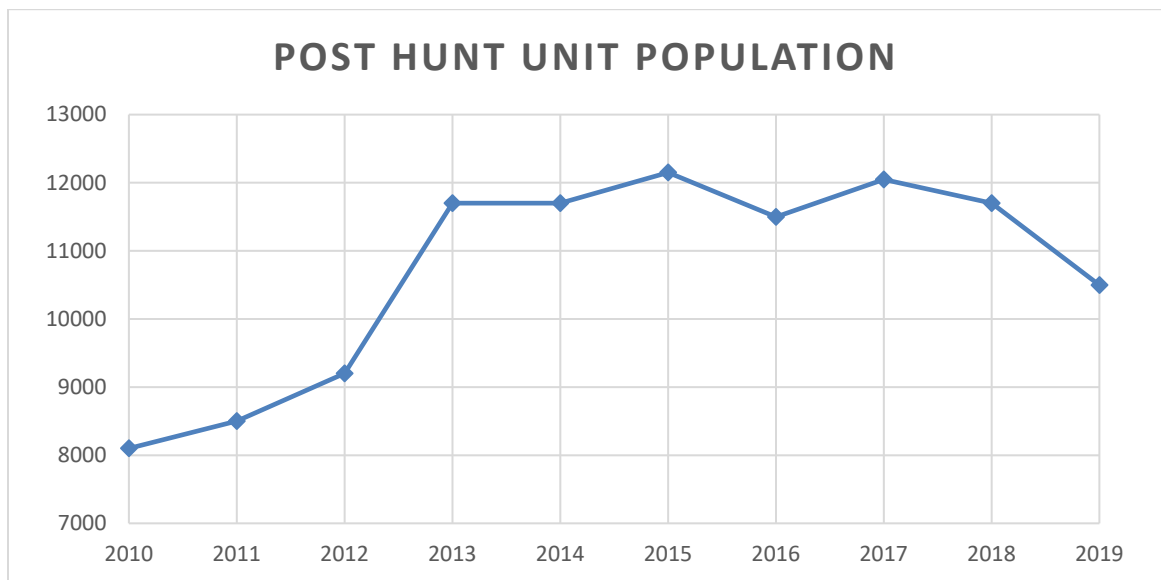
Ownership	YEARLONG RANGE		SUMMER RANGE		WINTER RANGE		TOTAL ACRES
	Area (acres)	%	Area (acres)	%	Area (acres)	%	
Forest Service	3210	25 %	246285	75%	35427	17%	284922
Bureau of Land Management	4732	37 %	4458	2%	105564	52%	114754
Utah State Institutional Trust Lands	1003	8 %	1708	0%	12271	6%	14982
Native American Trust Lands	0		0	0%	47	0%	47
Private	3667	29 %	63930	19%	43680	22%	111277
Department of Defense	0		0	0%	0	0%	0
USFS Wilderness	0		7082	2%	0	0%	7082
National Parks	0		6007	2%		0%	6007
Utah State Parks	0		0	0%	0	0%	0
Utah Division of Wildlife Resources	0		504	0%	5100	3%	5604
TOTAL	12652	100%	329972	100%	202088	100%	544675

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.
- Continue to review habitat boundaries and look for ways to improve boundaries that provide for better social and biological needs on the unit.

POPULATION MANAGEMENT OBJECTIVES

- 5 year Winter Herd Size – Manage for a 5-year target population of 11,000 wintering deer during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. This is an increase from the 2015 plan, which was 10,000. The 10-year average population estimate is 10,700. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.
- Herd Composition – Managed to maintain a three year average postseason buck to doe ratio according to the statewide plan of **18-20** bucks per 100 does.
- Harvest – General season hunting will be used to maintain and work towards objectives on this unit. Hunting strategies will include using Archery, Rifle, and Muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives.
- A Limited Entry muzzleloader hunt will also be offered on this unit in early November. Permits will be recommended up to 0.5% of the general-season draw permit total with a minimum of 5 permits on the unit.



POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and spring classifications, and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 model estimates the population at 10,500.

- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey, checking stations, and field bag checks. Achieve the target population size by use of antlerless harvest using a variety of harvest methods and seasons. Recognize that buck harvest will be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck: doe ratios
- **Limiting Factors (May prevent achieving management objectives)**
 - Crop Depredation - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
 - Habitat - At present, winter range is a limiting factor. Highway construction on the west side of the unit has limited the accessibility to winter range on the west side of I-15. This has created areas of heavy utilization and concentration north of Paragonah. Development has also reduced the amount of available winter range along the east side of I-15, especially in the Cedar City area. Excessive habitat utilization will be addressed through antlerless harvests and transplants from the unit.
 - Predation - Follow DWR predator management policy.
 - Highway Mortality - Cooperate with the Utah Department of Transportation (UDOT) in construction of highway fences, passage structures, warning signs, etc.
 - Illegal Harvest - If illegal harvest is identified as a significant source of mortality, an attempt to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Seek cooperative projects to improve the quality and quantity of deer habitat.
- Provide improved habitat security and escapement opportunities for deer.
- Work with federal and state partners in fire rehabilitation and prevention on crucial deer habitat through the WRI process

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data.

The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Work with land management agencies to evaluate and develop motorized travel plans to reduce disturbance during times of high stress, such as winter and fawning.

Habitat Improvement

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding wildfire areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheatgrass with desirable perennial vegetation.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Cooperate with federal land management agencies and local governments in developing and administering travel management plans for the purposes of habitat protection and escape or security areas.
- Future habitat work should be concentrated on the following areas.
 - Continue to reduce Pinyon and Juniper encroaching into shrubland, specifically in South Canyon, Five Mile Hollow, Buckskin Valley, Bear Valley and other areas within critical winter range.
 - Seek opportunities on reduce annual grasses and reestablish native perennial grasses, forbs and browse species in the Cottonwood, Swayback Knoll, and Buckskin Valley.
 - Seek opportunities to increase browse and perennial forbs in areas of critical winter range through mechanical treatment and reseeding

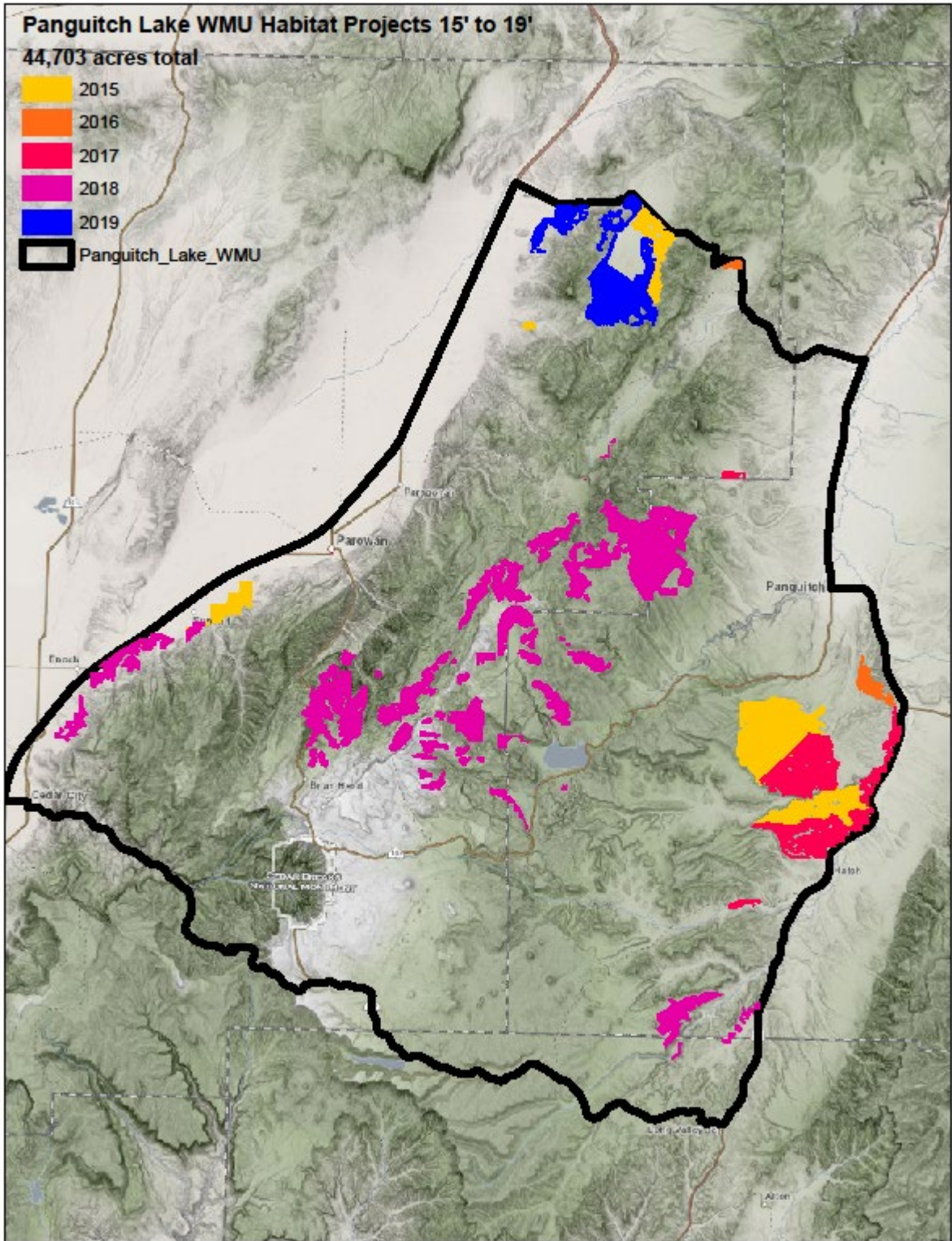
Treatments and Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 26,006 acres of land have been treated within the Panguitch Lake unit since the WRI was implemented in 2018. Treatments frequently overlap one another bringing the total treatment acres to 77,476 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

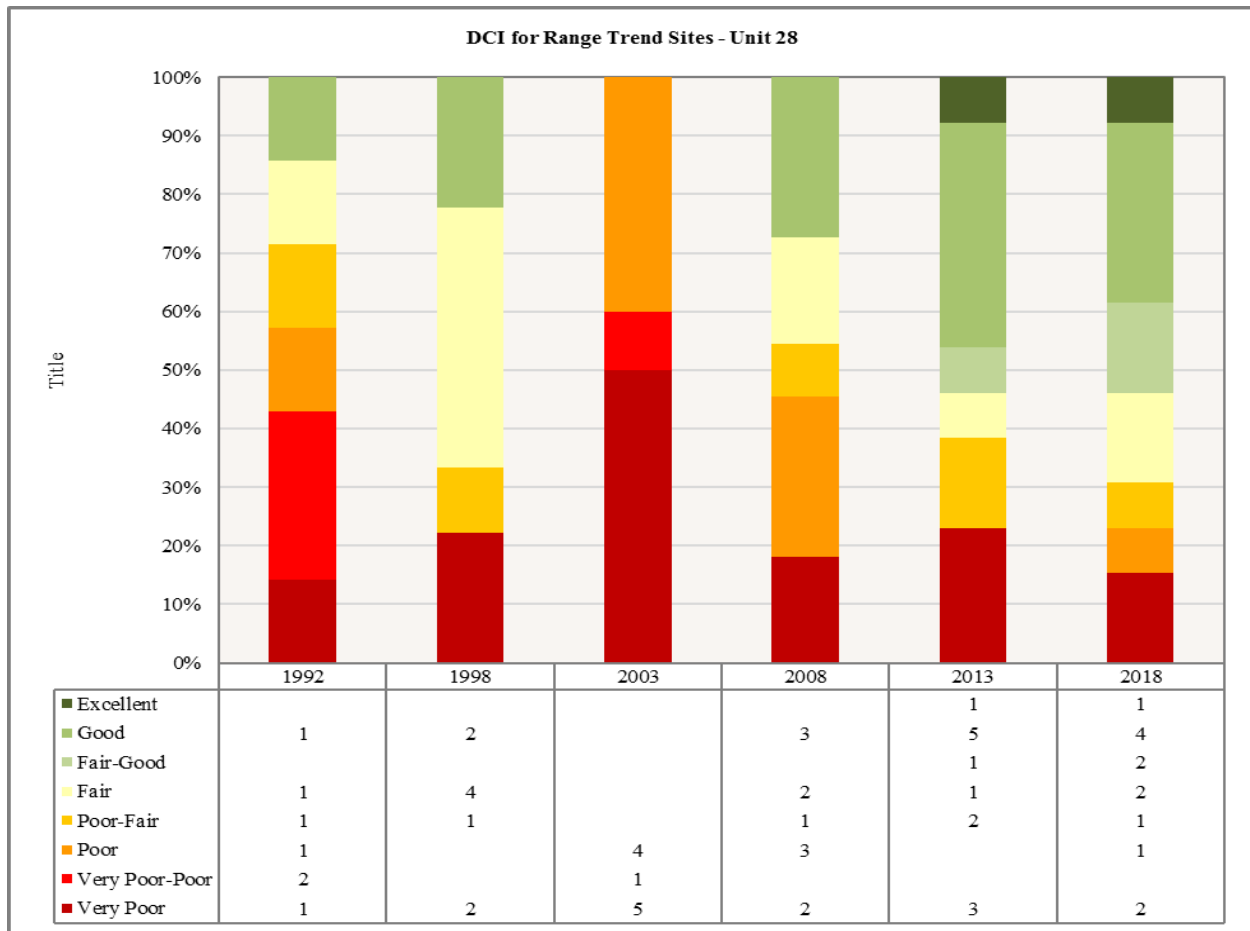
Treatments to reduce pinyon-juniper woodlands such as bullhog, chaining, prescribed fire, and lop-and-scatter are among the most common management practices. The use of seeding to supplement the herbaceous understory is also very common. Other common management practices are those to rejuvenate sagebrush stands such as chaining, mowing, and harrow treatments.

Type	Completed Acreage	Current Acreage	Pending Completed Acreage	Proposed Acreage	Total Acreage
Anchor Chain	608	2,080	0	0	2,688
Ely (One-Way)	332	0	0	0	332
Ely (Two-Way)	276	2,080	0	0	2,356
Bullhog	15,738	2,085	0	1,690	19,513
Full size	14,083	1,928	0	1,690	17,701
Skid steer	1,655	157	0	0	1,812
Forestry practices	0	0	0	193	193
Thinning (commercial)	0	0	0	193	193
Harrow	1,380	0	0	0	1,380
≤15 ft. (One-Way)	456	0	0	0	456
≤15 ft. (Two-Way)	270	0	0	0	270
> 15 ft. (One-Way)	572	0	0	0	572
> 15 ft. (Two-Way)	82	0	0	0	82
Mowing	1,238	0	0	0	1,238
Brush Hog	1,112	0	0	0	1,112
Other	126	0	0	0	126
Prescribed Fire	3,528	0	0	0	3,528
Pile Burn	3,528	0	0	0	3,528
Seeding (Primary)	1,925	0	15,265	213	17,403
Broadcast (Aerial-Fixed Wing)	1,103	0	15,265	213	16,581
Broadcast (Aerial-Helicopter)	301	0	0	0	301
Drill (Rangeland)	21	0	0	0	21
Ground (Mechanical Application)	457	0	0	0	457
Hand Seeding	43	0	0	0	43
Seeding (Secondary/Shrub)	344	0	0	68	412
Hand Seeding	344	0	0	68	412
Vegetation Removal/Hand Crew	24,091	7,288	0	2,760	34,139
Lop & Scatter	23,990	7,183	0	1,906	33,079
Lop-Pile-Burn	101	105	0	854	1,060
Other	0	28	0	0	28
Road Decommissioning	0	28	0	0	28
Grand Total	48,852	11,480	15,265	4,924	80,521
* Total Land Area Treated	43,308	11,480	14,776	4,912	74,476

Table 7.1: WRI treatment action size (acres) for completed, current, and proposed projects for WMU 28, Panguitch Lake. Data accessed on 02/18/2019. *Does not include overlapping treatments.



PERMANENT RANGE TREND SUMMARIES



Unit 28 Panguitch Lake

The condition of deer winter range within the Panguitch Lake management unit has generally improved on the study sites sampled since 1998. The majority of the undisturbed sites sampled within the unit are considered to be in poor to fair condition with the exception of the most current sample data in which the sites are considered to be in fair to good condition. The treated study sites are more variable due in part to the steady decrease in sites included in the figure as time since treatment increases. There are three studies, Swayback Knoll, Threemile Creek, and Panguitch Creek that were in very poor condition at the last reading. Both Panguitch Creek and Threemile Creek were treated with a bullhog and chain, respectively, and have low browse and herbaceous cover. Panguitch Creek was in very poor condition pretreatment and has remained even after treatment; there is no pretreatment data for Threemile Creek. Swayback Knoll experienced a fire and went from fair to very poor due to a drastic reduction in browse cover as well as an increase in annual grass cover.

The high elevation high mountain site supports a silver sagebrush community and is generally considered to be in good condition for deer and elk summer range. This community supports a diverse herbaceous understory that provides valuable forage during the summer months. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

The higher elevation upland and mountain sites, which support mountain big sagebrush communities, are

generally considered to be in good condition for deer winter range habitat on this unit. These communities support robust shrub populations that provide valuable browse in mild and moderate winters. While in generally good condition, these sites appear to be prone to encroachment from pinyon-juniper trees, which can reduce understory shrub and herbaceous health if not addressed. It is recommended that work to reduce pinyon-juniper encroachment (e.g. bullhog, chaining, lop and scatter, etc.) should continue in these communities. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

The mid elevation upland site supports a pinyon-Utah juniper community and is generally considered to be in very poor condition for deer winter range habitat on this management unit. This community is dominated by pinyon and juniper trees that provide good cover, but offer little to no browse or forage opportunities. This community is prone to infilling from pinyon-juniper trees which can reduce understory shrub and herbaceous cover if not addressed. It is recommended that work to reduce pinyon-juniper cover (e.g. bullhog, chaining, lop and scatter, etc.) should continue in this community. Depending on initial tree cover and residual species, reseeding may be necessary to restore herbaceous understory.

The mid elevation upland Wyoming big sagebrush communities are generally considered to be in fair condition for deer winter range habitat on this unit. These communities support robust shrub populations that provide valuable browse in moderate to severe winters. These communities are prone to encroachment from pinyon-juniper trees, which can reduce understory shrub and herbaceous cover if not addressed. Also, introduced perennial grasses can dominant the herbaceous component on some of these study sites. It is recommended that work to reduce pinyon-juniper encroachment should continue in these communities. Care should be taken in selecting treatment methods that will not increase annual grass loads. When reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible. Treatments to reduce annual grass may be necessary on some sites. Work to diminish fuel loads and create firebreaks should continue in order to reduce the threat of catastrophic fire.

The mid elevation upland black sagebrush communities are generally considered to be in good condition for deer winter range habitat on this unit. It is recommended that work to reduce pinyon-juniper encroachment should continue in these communities. Care should be taken in selecting treatment methods that will not increase annual grass loads. Work to diminish fuel loads and create firebreaks should continue in order to reduce the threat of catastrophic fire.

The lower elevation semidesert Wyoming big sagebrush community that has not been disturbed is generally considered to be in fair condition for deer winter range habitat on the unit. These communities are prone to wildfire and the study, which has burned since 1998, is in very poor condition. If wildfire occurs within these communities, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. These communities are susceptible to invasion from annual grass, primarily cheatgrass. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire on within these communities. Encroachment from pinyon-juniper trees is not typically an issue within these communities. Areas along I-15 maybe susceptible to heavy browsing due to I-15 limiting deer migration. It is recommended that work to diminish fuel loads and create firebreaks should continue within these communities in order to reduce the threat of catastrophic fire. Treatments to establish and increase browse species more rapidly following wildfire should also be implemented, and treatments to increase browse species on historic fires should be considered. If a treatment to rejuvenate sagebrush occurs, care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites.

The lower elevation semidesert basin big sagebrush community has not been disturbed is generally considered to be in good condition for deer winter range habitat on the unit. However, this community is prone to wildfire. If wildfire occurs within this community, they lose most of their value as deer winter range and reestablishment of valuable browse species is typically slow. This community is susceptible to

invasion from annual grass, primarily cheatgrass. Increased amounts of cheatgrass can increase fuel loads and increase the threat of wildfire on within this community. Encroachment from pinyon-juniper trees is not typically an issue within this community.

It is recommended that work to diminish fuel loads and create firebreaks should continue within these communities in order to reduce the threat of catastrophic fire. Treatments to establish and increase browse species more rapidly following wildfire should also be implemented, and treatments to increase browse species on historic fires should be considered. If a treatment to rejuvenate sagebrush occurs, care should be taken in selecting treatment methods that will not increase annual grass loads. Treatments to reduce annual grass may be necessary on some sites.

Precipitation

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2020. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011 (Figure 7.1a). The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and 2013; and displayed years of moderate to extreme wet years in 1982-1985, 1993, 1995, 1999, 2001, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009 and 2012; and displayed years of moderate to extreme wet years in 1982-1985, 1997-1998, 2008 and 2011 (Figure 7.1b) (Time Series Data 2018).

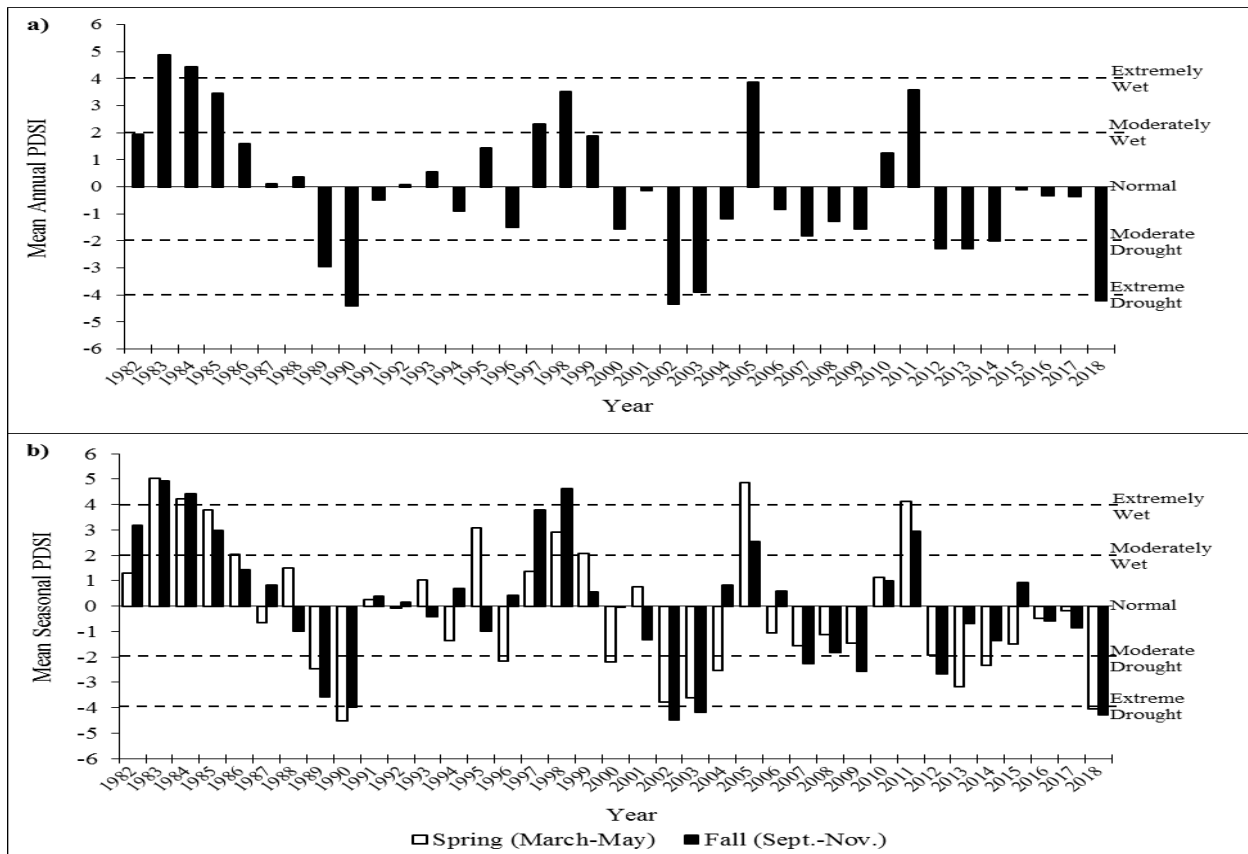
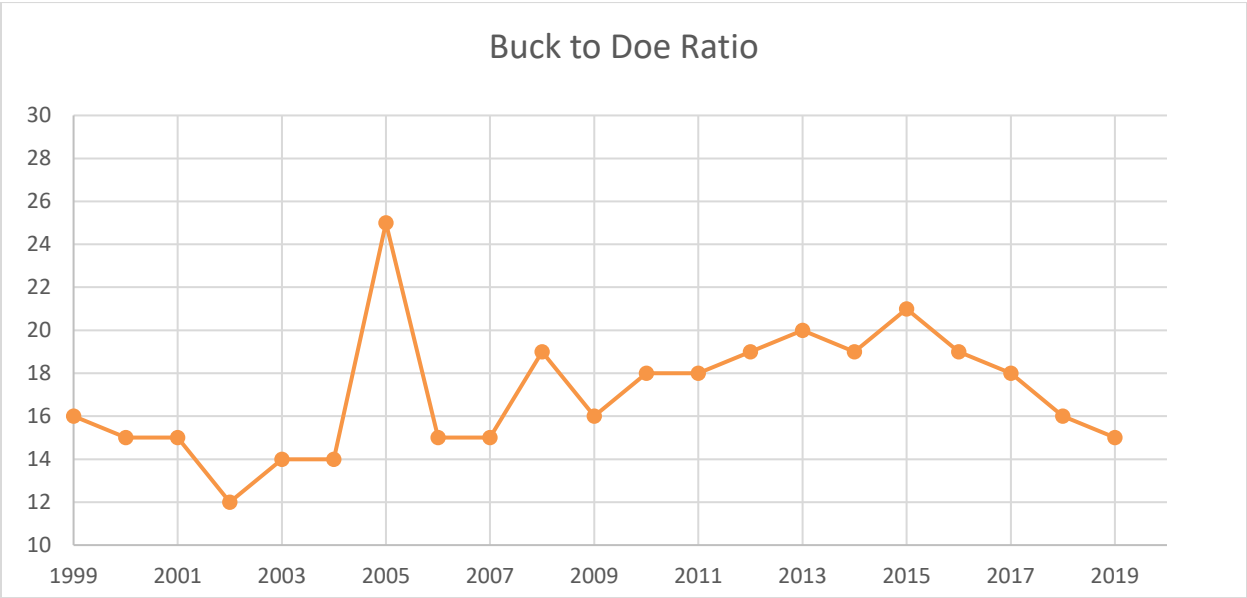
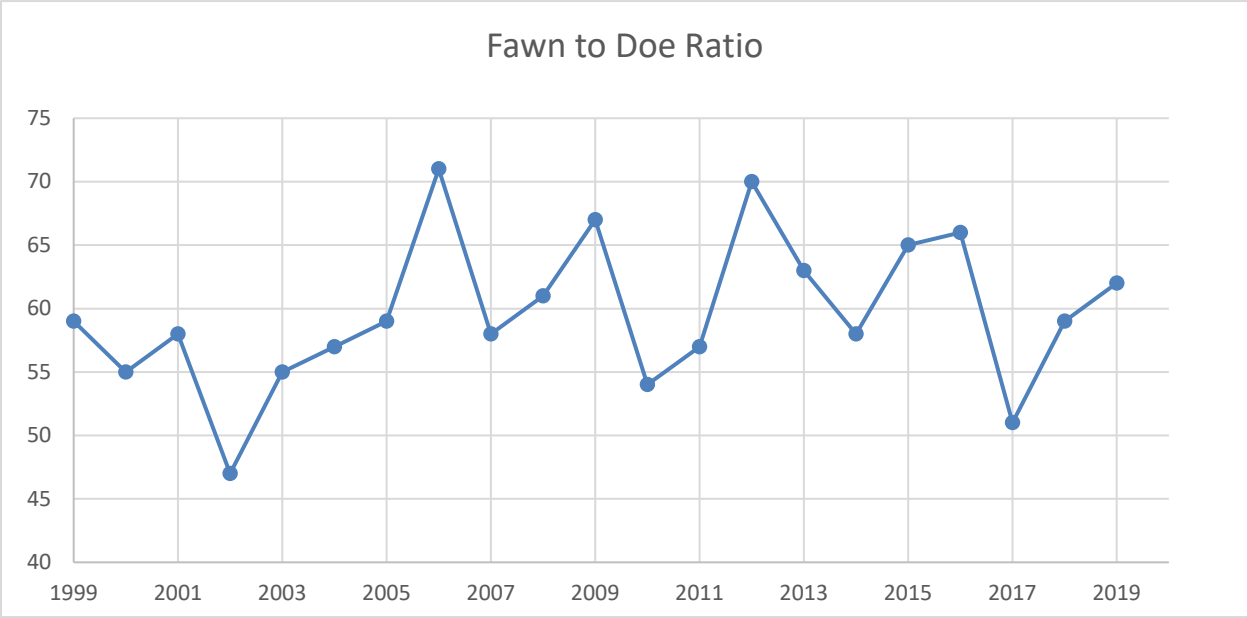


Figure 7.1: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2013. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought (Time Series Data 2019). a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.).



Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 29
Zion
2020

BOUNDARY DESCRIPTION

Iron, Kane and Washington Counties - Boundary begins at I-15 and the Utah-Arizona state line; north on I-15 to SR-14; east on SR-14 to US-89; south on US-89 to US-89A; south on US-89A to the Utah-Arizona state line; west on the Utah-Arizona state line to I-15.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Year-long range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	60638	20%	1270	<1%
Bureau of Land Management	1270	8%	19123	6%	268291	58%
Utah State Institutional Trust Lands	52	<1%	9059	3%	37693	8%
Native American Trust Lands	0	0%	0	0%	2226	<1%
Private	14149	91%	177242	59%	87560	19%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	35501	12%	67854	15%
Utah State Parks	0	0%	0	0%	0	0%
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%
TOTAL	15471	100%	301563	100%	464894	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- Target Winter Herd Size - Manage for a 5-year target population of 19,000 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. This is an increase from the 2015 plan, which was 15,500. The 10-year average population estimate is 15,300. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels. Change to population objective is based primarily on new data and models available beginning in 2013. New estimates of actual population numbers have been taken into account and the new objective should reflect the numbers of deer that are currently on the unit.

Unit 29

1994-2001 Objective: 9,000

2002-2014 Objective: 9,000

2015-2020 Objective: 15,500

2021-2025 Objective: 19,000

Change from last plan +3,500

- **Herd Composition** – This is a General Season unit and will be managed to maintain a three-year average postseason buck to doe ratio of 18-20 according to the statewide plan. This unit recently has exceeded the 20 bucks per 100 doe threshold post season in the three-year average. The summer range on this unit is dominated by private lands and increases in permits under the current hunt structure may only result in more trespass issues. The Statewide Mule Deer Management plan allows for change in hunt structure to accommodate for migratory herds and that may be an option considered if the adding more permits under the current hunt structure becomes problematic.
- **Harvest** – General Buck Deer hunt regulations, using archery, rifle, and muzzleloader hunts apply. In an effort to reduce hunter crowding on the traditional any-weapon season, an early any-weapon hunt was initiated in 2018 with 20% of the total permits being offered during this season. Hunter success rates have been similar to the traditional any-weapon season.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- **Population Size** - Utilizing harvest data, postseason and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 post- season model estimates the population at 19,200 deer.
- **Buck Age Structure** - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- **Migration** – In the fall/winter of 2018/19 a migration study was started on this unit by GPS collaring 80 adults, does and bucks on multiple winter ranges around the unit. Some deer have been observed spending the summer on the Panguitch Lake unit to the north. This study has also allowed us to monitor adult survival and has improved our data used to model the post-season population.
- **Harvest** - The primary means of monitoring harvest will be through the statewide uniform harvest survey and the use of checking stations. Achieve the target population size by use of antlerless harvest using a variety of harvest methods and seasons. Recognize that buck harvest will be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck: doe ratios

Year	Buck harvest	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2017	1622	60.4	22.8	19,000	15,500	122.6%
2018	1518	57.4	22.6	19,900	15,500	128.4%
2019	1587	58.8	19.1	19,200	15,500	123.9%
3 Year Avg	1576	58.9	21.5			125%

Limiting Factors (May prevent achieving management objectives)

- **Crop Depredation** - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- **Habitat** - Public land winter range availability, landowner acceptance and winter range forage conditions will determine herd size. Excessive habitat utilization will be addressed with hunting.

- Predation - Follow DWR predator management policy.
 - This unit is currently under a Predator Management Plan for cougars. In the winter/spring of 2020, 9 of the 11 collared adult deer were taken by cougars. This PMP will take effect in November 2020. This unit is currently under a Predator Management Plan for bighorn sheep. Being under a PMP means that cougar can be taken without a quota.
- Highway Mortality - Cooperate with the Utah Dept. of Transportation in construction of highway fences, passage structures, warning signs, etc. Highway mortality is not a limiting factor on this unit.
- Illegal Harvest - If illegal harvest is identified as a significant source of mortality, an attempt to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Reduce highway deer mortality along Interstate I-15 south of Cedar City and along Highway 14 east of Cedar City.
- A major proportion of both summer and winter habitat for deer on this unit is on private land. Therefore, it is paramount to work with private landowners to maintain both summer and winter habitat. Currently, there are two CWMU's. One is comprised of 15,000 acres (Mt. Carmel) in the Muddy Creek drainage on the east portion of this unit. Another is comprised of 5500 acres (East Zion) in the Clear Creek drainage. Other landowners have expressed interest in a CWMU and they may be organized in the future.
- Seek cooperative projects to improve the quality and quantity of deer habitat in order to support herd objectives.
- Provide improved habitat security and escapement opportunities for deer.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection and Maintenance

- Continue to work with UDOT to implement fencing and other strategies to reduce deer-vehicle collisions along I-15, SR-14, and US-89.
- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality.

- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.

Habitat Improvement

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips, and reseed areas dominated by cheat grass with desirable perennial vegetation.
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Future habitat work should be concentrated on the following areas.
 - Seek opportunities to increase browse in burned areas of critical summer and winter range.
 - Continue to reduce Pinion and Juniper encroaching into shrubland in critical winter range. Specifically, on the west side of the Zion Unit from Cedar City south to Toquerville where it is adjacent to I-15 in critical winter range, and on the East Zion in the Yellow jacket and Pine Spring areas.
 - Quaking Aspen forests on higher elevation private land, NPS land, & USFS land

RANGE TREND SUMMARY

Management Unit Description

Geography

The Zion wildlife management unit includes the southern portion of the Markagunt Plateau. The unit also contains Pine Spring Knoll, Kolob Peak, and Little Creek Mountain. Pine Knoll, located in the northeastern part of the unit, is the highest point with an elevation of 10,000 feet. In contrast, the lowest point in the unit has an elevation of about 2,500 feet and is located east of St. George. Zion National Park is also included in the unit; the highest point in the park is Horse Ranch Mountain with an elevation of 8,726 feet, and the lowest point is Coalpits Wash at 3,666 feet. The park occurs at the junction of the Mojave Desert, Colorado Plateau, and Great Basin, giving it a unique assembly of flora and fauna in addition to a variety of geographical configurations such as canyons, buttes, mesas, natural arches, and monoliths. Towns in this unit include Kanarrville, Hurricane, Springdale, Rockville, Mt. Carmel, and the cities of St. George and Cedar City on the unit boundaries.

A number of streams are located within this unit, including La Verkin Creek, Muddy Creek, Blue Creek, Crystal Creek, and Deep Creek: most of these are tributaries of the Virgin River. The Virgin River itself is formed by the confluence of the North Fork Virgin and East Fork Virgin just outside of Zion National Park near the town of Springdale. Navajo Lake and Kolob Reservoir are also found within the Zion management unit.

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 7 inches in the southwest portion of the unit near St. George to 36 inches near Midway Valley. All of the Range Trend and WRI monitoring studies on the unit occur within 12-18 inches of precipitation (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South-Central division (Division 4).

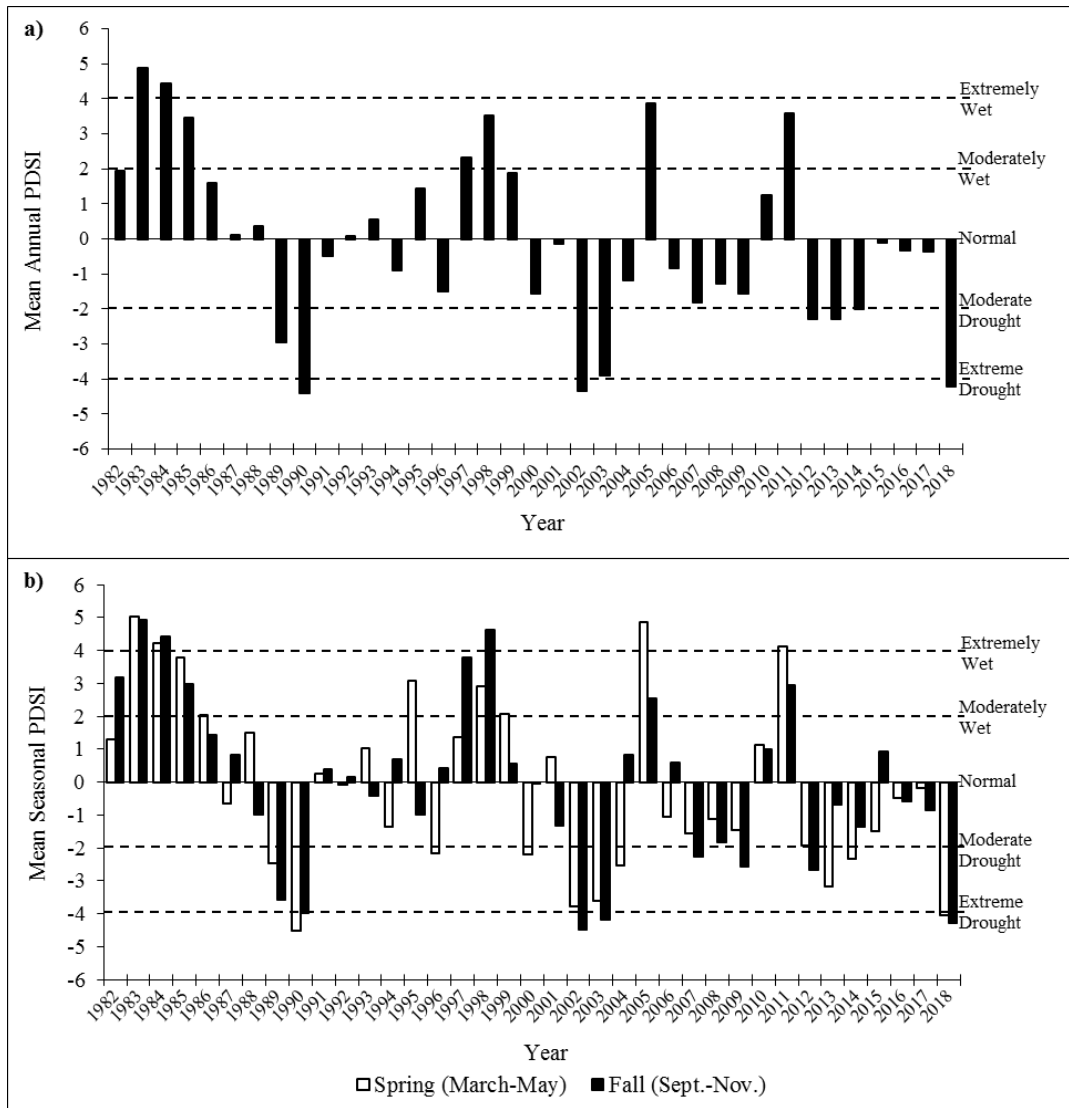


Figure 1.1: The 1982-2018 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2018. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought. a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2019).

Summer Range Habitat

Most of the summer range is found in the northern part of the unit, which includes the southern end of the Markagunt Plateau. Unlike the majority of the wildlife management units in the state, most of the summer range in the Zion unit occurs on private land with increased summer home development becoming more of a management problem. The Forest Service and Zion National Park administrate the remaining summer range. Winter range predominately occurs on BLM land, but Zion National Park and private land make up a minor portion.

Winter Range Habitat

Winter range is a limiting factor on the west side of the Zion Unit from Cedar City south to Toquerville where it is adjacent to I-15. In addition, the majority of the summer range occurs on private land with increased summer home development becoming more of a management problem.

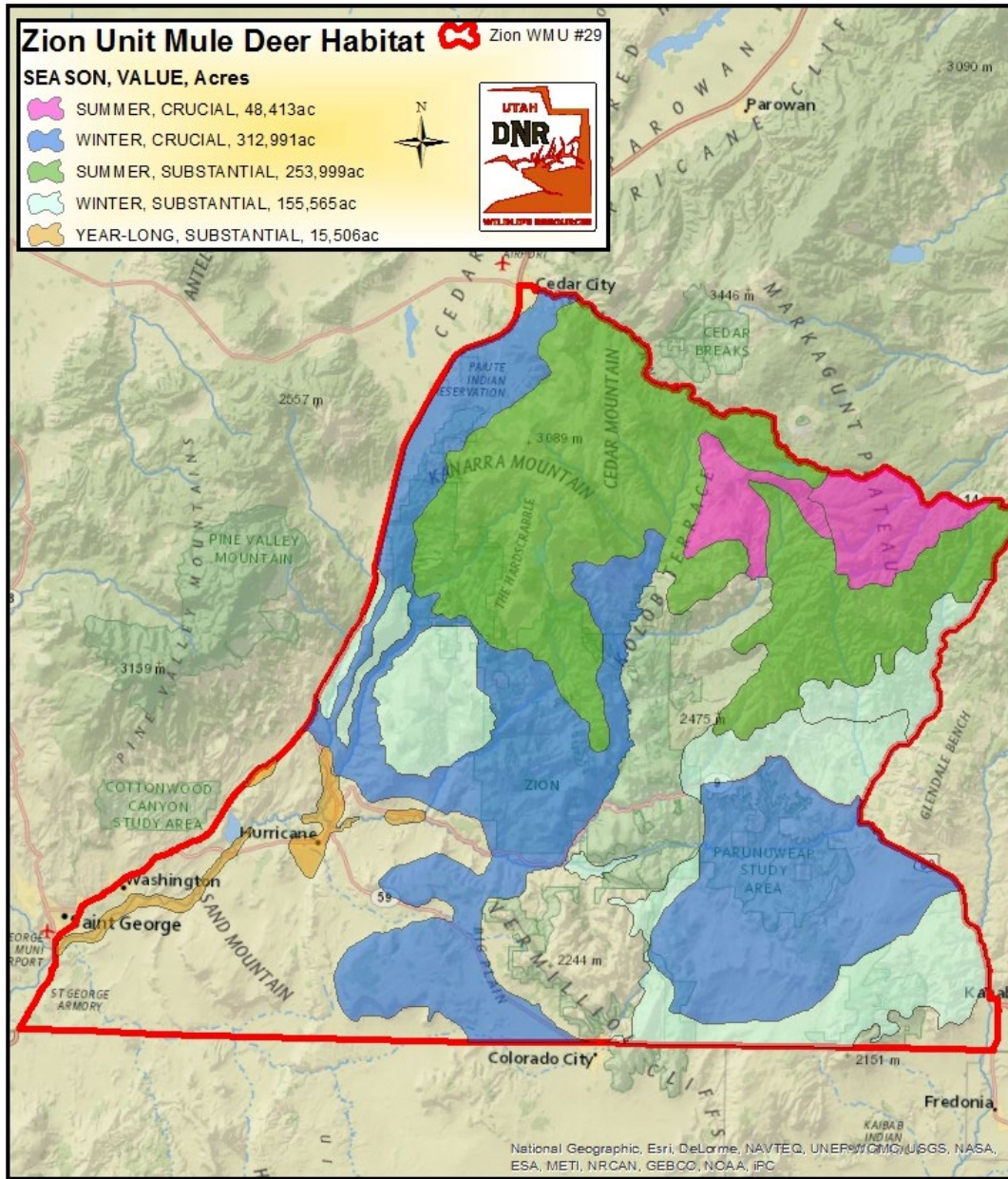
Wildfire has also had an impact on the deer winter range in this unit. The Kolob fire of 2006 was the largest wildfire in the unit at 17,631 acres, and burned almost entirely within the western boundary of Zion National Park. The Ranch fire of 2006 burned 6,108 acres of deer winter range on the western side of the unit near Pintura. The Shingle fire of 2012 and Big Wash fire of 2002 burned several thousand acres each of deer summer range in the

northern portion of the unit. Other large fires have occurred within the unit boundaries, but did not occur on deer habitat. Most recent fires burned less than 1,000 acres and have had negligible impact on deer winter range.

According to the LANDFIRE Existing Vegetation Coverage model, nearly 33% of the unit is comprised of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. While these woodlands provide valuable escape and thermal cover for wildlife, encroachment and invasion of pinyon-juniper woodlands into sagebrush communities has been shown to decrease sagebrush and herbaceous cover, therefore decreasing available wildlife forage (Miller, Svejcar, & Rose, 2000).

Annual grasslands, primarily cheatgrass (*Bromus tectorum*), comprise a small proportion of the unit and pose a minimal threat by increasing fuel loads and decreasing ecological resilience.

ZION MULE DEER HABITAT



Range Trend Studies

Range Trend studies have been sampled within WMU 29 on a regular basis since 1987, with studies being added or suspended as was deemed necessary. Due to changes in sampling methodologies, only data collected

following the 1992 sample year is included in this summary. Monitoring studies of WRI projects began in 2004; when possible WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment. Due to the long-term nature of the studies, many of the Range Trend and WRI studies have had some sort of disturbance or treatment prior to or since study establishment.

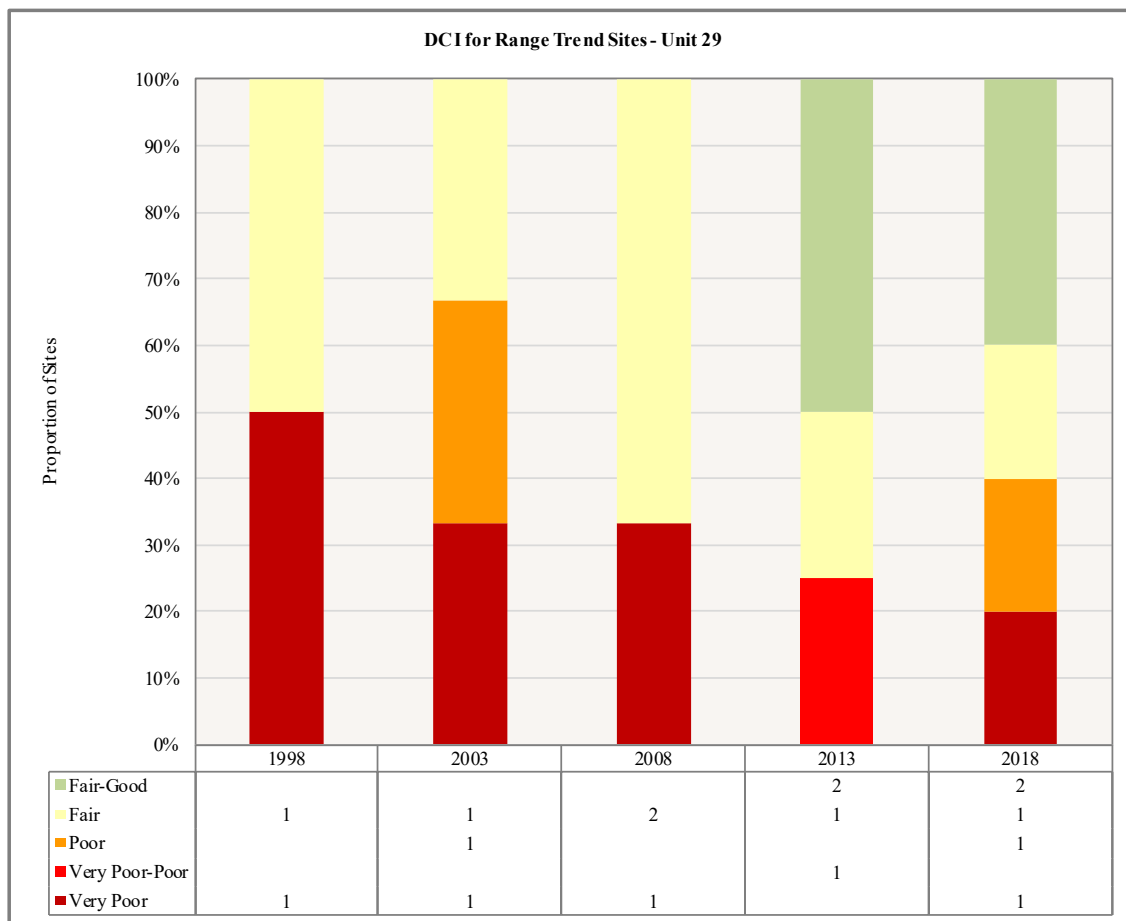
Range Trend studies that have not had recent disturbance or treatments are summarized in this report by ecological site or potential. Range Trend and WRI studies that have a disturbance or treatment during the reported sample period are summarized by the disturbance or treatment type. For a comprehensive report for each treatment type associated with the range trend site please refer to the full report. The full report can be viewed at the UDWR's regional office in Cedar City, Utah or at the UDWR Headquarters in Salt Lake City. An online version of the report will become available and currently you can access most of the results online at:

https://wildlife.utah.gov/.../range-trends/.../2018_Southern_Region_Unit_Summary_Report.pdf

Study Trend Summary (Range Trend)

Deer Winter Range Condition Assessment

The condition of deer winter range within the Zion management unit has shown changes on the sites sampled since 1998. The active Range Trend sites sampled within the unit are considered to be in very poor to fair-good condition as of the 2018 sample year. The North Hills and Barracks Chaining studies have remained in fair-good condition. The Kolob Terrace study has stayed in fair condition. The Elephant Gap Exclosure Outside and Elephant Butte studies have remained in poor to very poor condition.



Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 29, Zion.

Upland (Big Sagebrush)

The studies that are considered to be of the Upland (Big Sagebrush) ecological type are within deer winter range and are considered to be in condition varying from very poor to fair. Annual grass cover has been observed on the Kolob Terrace site: these grasses pose a threat because they increase fuel loads which can lead to an increased wildfire regime. Conifer encroachment was also observed on both study sites and this will likely increase in future years.

Although pinyon and juniper presence is currently limited on these study sites, further tree encroachment could lead to reduced herbaceous and shrub productivity. It is recommended that when necessary, work to reduce these tree species (e.g. bullhog, chaining, lop and scatter, etc.) should begin in areas where it would be beneficial to wildlife habitat. On sites with significant cover from annual grasses, treatments that could be helpful to restoring proper ecological function include changes to grazing, herbicide treatment, and other cultural control methods. If reseeded is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

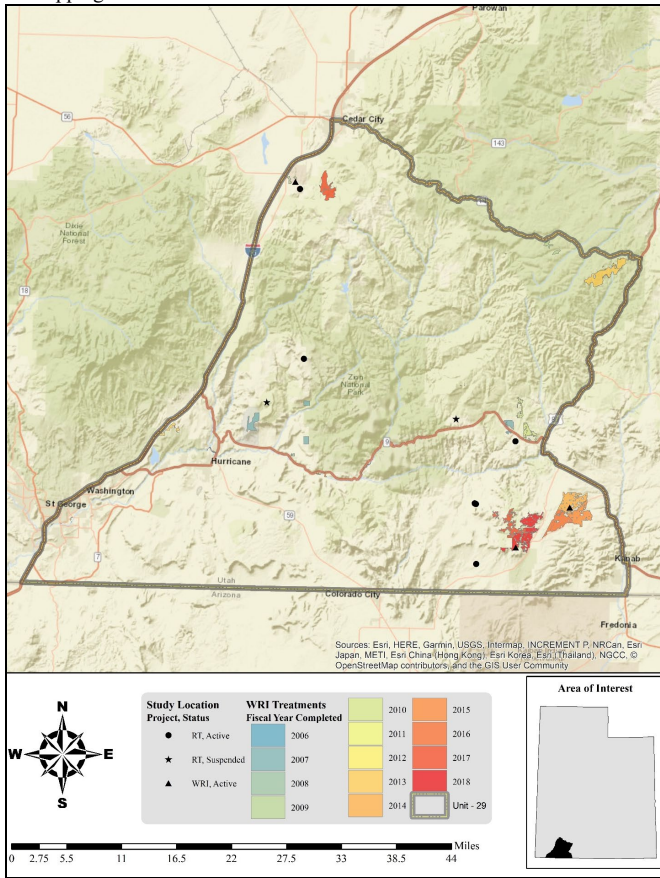
Treatments/Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 17,538 acres of land have been treated within the Zion unit since the WRI was implemented in 2004. In addition, 2,078 acres are currently being treated and treatments have been proposed for 6,770 acres. Treatments frequently overlap one another bringing the total treatment acres to 26,386 acres for this unit. Other treatments have occurred outside of the WRI through independent agencies and landowners, but WRI projects comprise the majority of work done on deer winter ranges throughout the state of Utah.

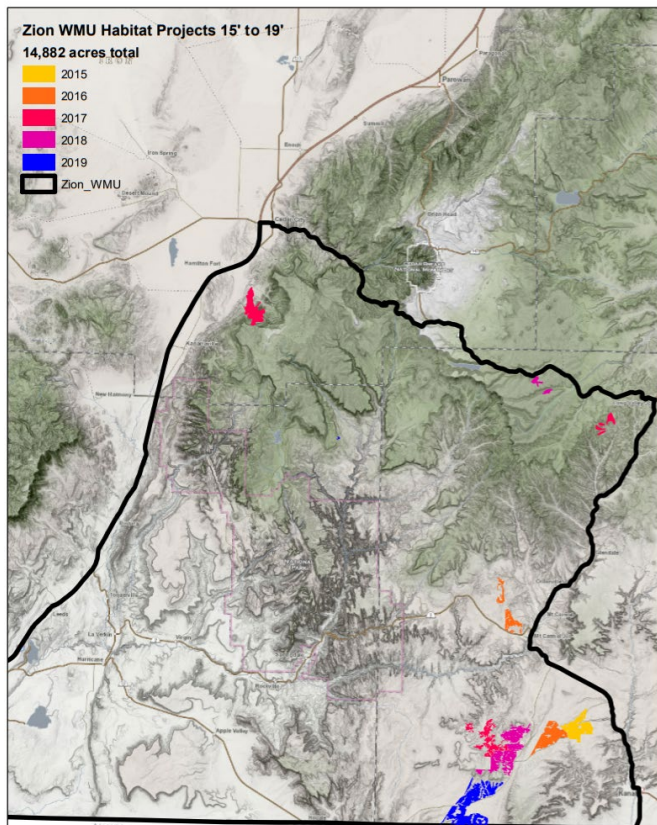
The most common management practice in this unit is the use of bullhog treatments to remove pinyon and juniper trees. Seeding plants to augment the herbaceous understory is also very common and frequently occurs together with other treatments. Other management practices include (but are not limited to): anchor chaining and manual vegetation removal techniques to remove trees, forestry practices such as thinning, discing, and prescribed fire.

Type	Completed Acreage	Current Acreage	Pending Completed Acreage	Proposed Acreage	Total Acreage
Anchor Chain	1,341	0	0	1,075	2,416
Ely (Two-Way)	1,341	0	0	1,075	2,416
Bulldozing	53	0	0	0	53
Tree Push	53	0	0	0	53
Bullhog	10,042	2,262	0	2,496	14,800
Full Size	9,892	2,262	0	2,496	14,650
Skid Steer	150	0	0	0	150
Disc	349	0	0	0	349
Plow (One-Way)	341	0	0	0	341
Off-Set (Two-Way)	8	0	0	0	8
Forestry Practices	0	0	0	664	664
Thinning (Commercial)	0	0	0	664	664
Harrow	45	0	0	0	45
≤15 ft. (One-Way)	45	0	0	0	45
Herbicide Application	37	0	0	0	37
Spot Treatment	37	0	0	0	37
Planting/Transplanting	449	0	0	0	449
Prescribed Fire	298	0	0	0	298
Seeding (Primary)	5,310	21	0	2,077	7,408
Broadcast (Aerial-Fixed Wing)	4,248	0	0	2,077	6,325
Broadcast (Aerial-Helicopter)	1,046	0	0	0	1,046
Hand Seeding	16	0	0	0	16
Ground (Mechanical Application)	0	21	0	0	21
Seeding (Secondary/Shrub)	14	0	0	0	14
Hand Seeding	14	0	0	0	14
Vegetation Removal/Hand Crew	2,803	0	0	2,618	5,421
Lop & Scatter	2,803	0	0	1,764	4,567
Lop-Pile-Burn	0	0	0	854	854
Grand Total	20,741	2,283	0	8,930	31,954
* Total Land Area Treated	17,538	2,078	0	6,770	26,386

WRI treatment action size (acres) for completed, current, and proposed projects for WMU 29, Zion. Data accessed on 02/18/2019. *Does not include overlapping treatments.



2015 – 2019 Habitat Project Areas



DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 30
Pine Valley
2020

BOUNDARY DESCRIPTION

Iron and Washington counties - Boundary begins at I-15 and the Utah-Arizona state line; north on I-15 to SR-56; west on SR-56 to the Lund Highway; northwest along the Lund Highway to the Union Pacific railroad tracks at Lund; southwest on the Union Pacific railroad tracks to the Utah-Nevada state line; south on this state line to the Utah-Arizona state line; west on this state line to I-15.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Year-long range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	15557	23%	212454	67%	182357	38%
Bureau of Land Management	47018	70%	36143	11%	210905	44%
Utah State Institutional Trust Lands	830	1%	1446	<1%	22429	5%
Native American Trust Lands	0	0%	5859	2%	141	<1%
Private	3422	5%	13944	4%	64236	13%
Department of Defense	0	0%	0	0%	0	0%
USFWS Refuge	0	0%	0	0%	0	0%
National Parks	0	0%	0	0%	0	0%
Utah State Parks	0	0%	0	0%	309	<1%
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%
Wilderness (USFS & BLM)	0	0%	47881	15%	2350	<1%
TOTAL	66827	99%	317727	100%	482727	100%

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- Target Winter Herd Size - Manage for a 5-year target population of 19,500 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. This is an increase from the 2015 plan, which was 16,000. The 10-year average population estimate is 15,900. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels. Change to the population objective is based on this population's performance, improved range conditions, the amount of available habitat and the lack of

range damage from deer. New estimates of actual population numbers have been taken into account and the new objective should reflect the numbers of deer that are currently on the unit.

Unit 30

1994-2001 Objective: 16,000
 2002-2014 Objective: 12,800
 2015-2020 Objective: 16,000
 2021-2025 Objective: 19,500
 Change from last plan +3,500

- Herd Composition – This is a General Season unit and will be managed to maintain a three-year average postseason buck to doe ratio of 18-20 according to the statewide plan.

Harvest – General Buck Deer hunt regulations, using archery, rifle, and muzzleloader hunts apply. In an effort to reduce hunter crowding on the traditional any-weapon season, an early any-weapon hunt was initiated in 2018 with 20% of the total permits being offered during this season. Hunter success rates have been similar to the traditional any-weapon season.

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and mortality estimates, a computer model has been developed to estimate winter population size. The 2019 post-season model estimates the population at 19,700 deer.
- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, uniform harvest surveys and field bag checks.
- Survival – Continue to monitor Adult and Fawn survival with GPS tracking collars. Use this data to learn more about migration routes, patterns and timing.
- Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey and the use of checking stations. Achieve the target population size by use of antlerless harvest using a variety of harvest methods and seasons. Recognize that buck harvest will be above or below what is expected due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and Wildlife Board process to achieve management objectives for buck: doe ratios

Year	Buck harvest	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2017	1816	56.6	23.9	19,700	16,000	123%
2018	1327	46.6	23.8	19,800	16,000	124%
2019	1513	59.7	21.2	19,700	16,000	123%
3 Year Avg	1552	54.3	23.0			

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation - Take all steps necessary to minimize depredation as prescribed by state law and DWR policy.
- Habitat - Public land winter range availability, landowner acceptance and forage conditions will determine herd size. Excessive habitat utilization will be addressed with hunting.
- Predation - Follow DWR predator management policy.
 - The southern and eastern portion of this unit is currently under a Predator Management Plan with unlimited cougar harvest beginning the fall of 2020. This strategy is to protect desert bighorn sheep that were transplanted to the Beaver Dam Mountains in 2015. Deer in the

Browse and Beaver Dam mountain area will also benefit from this cougar management strategy. The northern portion of this unit is under a Harvest Objective hunt strategy for cougar.

- Highway Mortality - Mortality along I-15, SR-56, SR-18 has been significant. At several locations on SR-56, SR-18, New Harmony and Newcastle bench roads flashing deer crossing signs have been installed in cooperation with the Utah Dept. Of Transportation, Iron and Washington County road departments. Deer fencing has been installed along I-15 between Cedar City and New Harmony. Highway mortality will be monitored and additional highway fences, passage structures and warning signs will be added if needed.
- Illegal Harvest - If illegal harvest is identified as a significant source of mortality, an attempt to develop specific preventive measures within the context of an action plan will be developed in cooperation with the Law Enforcement Section.

HABITAT MANAGEMENT OBJECTIVES

- Maintain and/or enhance forage production through direct range improvements throughout the unit on winter and summer range to achieve population management objectives.
- Use the most current range trend data and the best available science when prioritizing, designing, and implementing habitat improvement projects.
- Maintain critical fawning and fawn rearing habitats in good condition.
- Manage public lands adjacent to areas with heavy agricultural depredation to promote deer use during late summer.
- Maintain and protect critical winter range from future losses. Acquire critical winter range when the opportunity arises.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments, pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.
- Continue existing monitoring studies, and coordinate with BLM on additional riparian monitoring.
- Seek opportunities to partner with Universities to coordinate research in areas of need.

Habitat Protection and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to oil and gas development, wind energy, solar energy, and transmission line construction.
- Coordinate with federal and state partners in designing projects that will improve fire resiliency and protect areas of crucial habitat.

- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands. Continue working toward blocking up UDWR properties through land exchange.
- Manage vehicle access on Division of Wildlife Resources land to limit human disturbance during times of high stress, such as winter and fawning.
- Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid- to late summer.
- Protect riparian areas to furnish cover, water and succulent forage adjacent to areas with historic agricultural damage.
- Provide guzzlers or other water sources where needed on critical summer fawning areas or in times of severe drought.

Habitat Improvements

- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects.
- Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by Cheat grass with desirable perennial vegetation.
- Reduce expansion of Pinion-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinion-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.
- Seek opportunities to increase browse in burned areas of critical winter range.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Seek out opportunities to improve fawning habitat across the unit. Consider summer range habitat improvement projects that remove encroaching trees, improves succulent vegetation and wet meadow habitat, increases aspen recruitment, enhances and/or protects riparian areas, use prescribed fire to promote early succession habitats where appropriate.
- Future habitat work should be concentrated on the following areas.
 - Landscape level watershed improvements on the Pine Valley Ranger District of the Dixie National Forest with a focus on transitional ranges
 - Water developments for Mule Deer on federal and state land.
 - Retreatment of older treatments (>10years) to protect investment through maintenance.
 - Continued habitat improvements in the Pinto/Iron Town areas.
 - Look for opportunities to implement projects that reduce highway mortality to Mule Deer on highway 56 and 18.

RANGE TREND SUMMARY

Management Unit Description

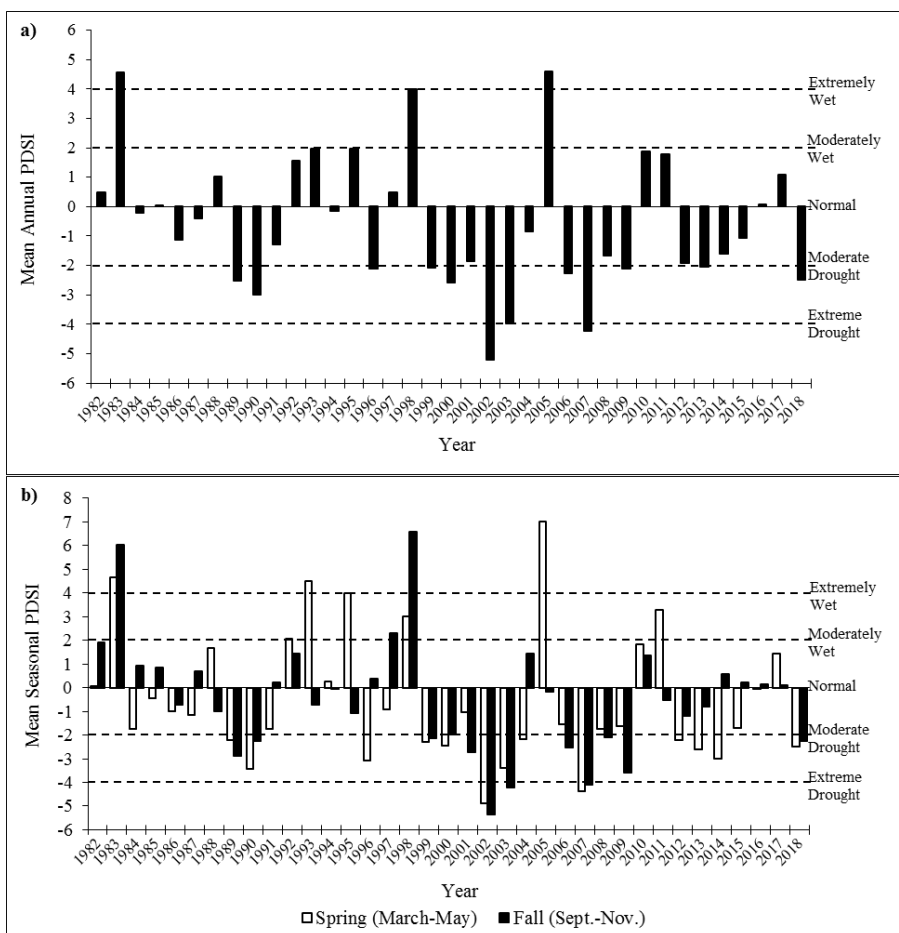
Geography

The Pine Valley wildlife management unit is located in the southwest corner of Utah. It includes three physiographic regions: Mojave Desert, Great Basin, and Colorado Plateau. The Mojave Desert is located in the southern portion of the unit. The Great Basin is located in the central and northern sections of the unit. The eastern section of the unit, mainly the Pine Valley Mountains and Harmony Mountains, are on the western edge of the Colorado Plateau. These physiographic regions have a diverse array of vegetation communities and transitional communities that are important areas for wildlife.

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 7 inches in the far southeastern and southwestern portions of the unit up to 35 inches on the high-elevation peaks of the Pine Valley Mountains. All of the Range Trend and WRI monitoring studies on the unit occur within 9-28 inches of precipitation (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit was compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the Western, Dixie, and South Central divisions (Divisions 1,2, and 4).



Summer Range

Summer range is confined to elevations above 6,000 to 6,500 feet on the New Harmony and Pine Valley Mountains. The summer range consists of dense conifers with a few aspen clones and dry meadows at higher elevations and mixed oak brush, mountain brush, southern desert shrub, and sagebrush-grass at lower elevations. Part of the summer range is within the officially designated wilderness area. The vegetation characteristics of the Harmony Mountain and lower slopes of Pine Valley are principally oak brush and mountain brush. Aspen and conifer are common on the higher portions of the Pine Valley Mountains, but much less prevalent on the Harmony Mountains. Sagebrush-grasslands and meadows can be found at the summit of the Harmony Mountains. These areas are important for deer during a short period in the summer months. However, these areas have been heavily impacted by cattle. Many similar sagebrush grasslands and meadows occur on the northern end of the Pine Valley Mountains. Summer deer concentrations are primarily on Harmony Mountain and the north end of the Pine Valleys.

Winter Range

Herd unit 30 winter range varies greatly, depending upon elevation. North of the Great Basin-Colorado River divide, pinion-juniper and sagebrush-grass predominate. South of the divide, pinion-juniper is still prevalent but there are increasing amounts of desert shrub dominated by shrub live oak (*Quercus turbinella*) and other browse species not often found in the north. Both areas possess important acreages of seeded range, most notably east of Pinto at Page Ranch, Woolsey Ranch, New Harmony and Pintura Bench. Deer tend to congregate in these areas, especially the latter three. Additional winter range in the Pine Valley unit can be found south of Pintura, but currently supports few deer. Winter range is extensive, but not uniformly utilized. Pinion-juniper is the dominant vegetation type, but there are also other vegetation types that include large areas of sagebrush-grass, southern desert shrub, oak brush, and mountain brush. Important critical winter concentration areas include the area east of Central, the lower Pinto Creek drainage, the Antelope Range, Iron Mountain, the Shoal Creek drainage, Moody Creek, Tobin Bench, and the middle portion of the East Fork of Beaver Dam Wash. Only during the most severe winters do deer utilize the lower portions of the winter range, especially the Mojave Desert areas. During the spring, summer, and fall, crucial concentration areas include the higher elevations of the Bull Valley Mountains, Lost Peak, Maple Ridge, the slopes surrounding Pine Valley Reservoir, the meadows of the Whipple Valley area, and Flattop Mountains.

Limiting Factors to Big Game Habitat

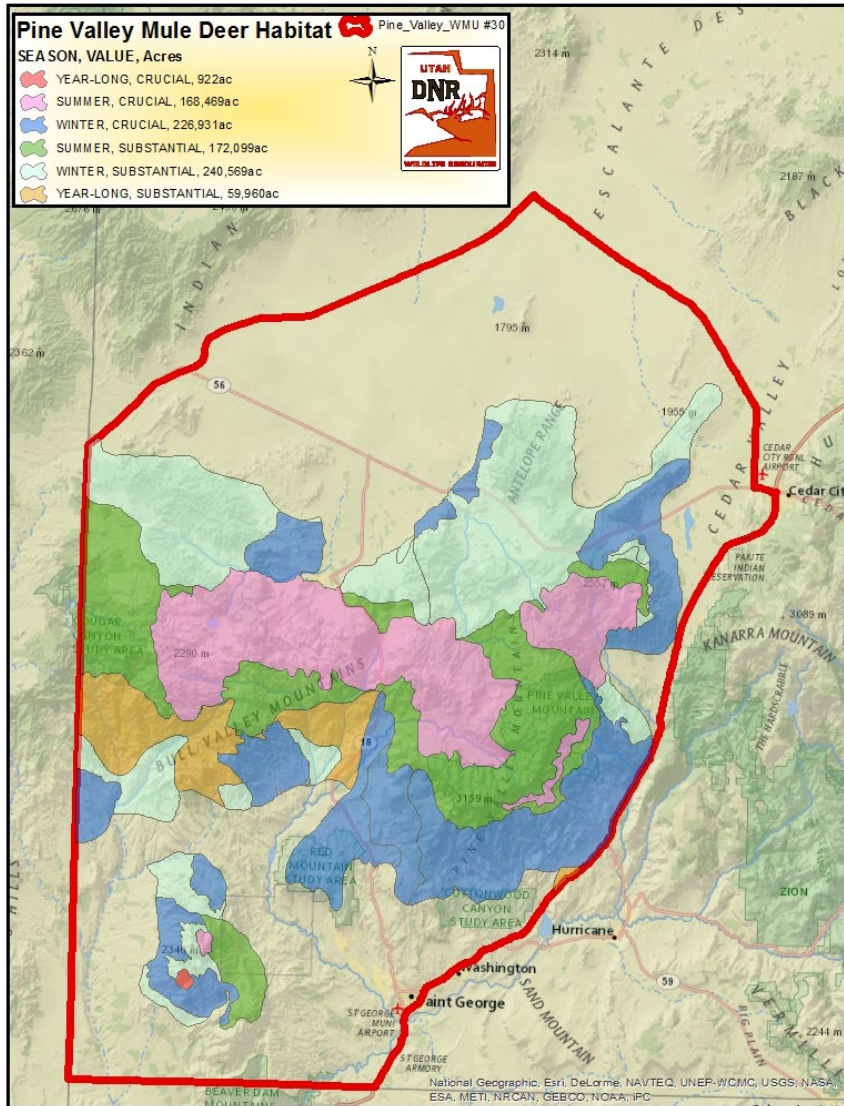
Mortality of deer has been significant along I-15, SR-56, and SR-18. Deer proof fencing has been erected along I-15, impeding deer movement. Fencing may pose some barrier to deer migration to the wintering grounds.

Wildfire has had a significant impact on deer habitat in the southern and western portions of this unit in recent years. From 2000-2012, over 700,000 acres have burned in unit 30 in a variety of vegetative types. The abundance of cheat grass, primarily within the lower elevation sagebrush communities, increases the threat of catastrophic wildfires within the unit.

In addition to wildfire, severe flooding in January 2005 likely impacted deer habitat that drastically altered riparian communities along Moody Wash, Mogatsu Creek, Beaver Dam Wash, Santa Clara River, Virgin River, and neighboring drainages. Results of these events will likely impact deer use of these areas for several years.

Encroachment by pinion-juniper woodland communities also poses a substantial threat to important sagebrush rangelands. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease the sagebrush and herbaceous components, and therefore decreases available forage for wildlife.

Pine Valley Unit Mule Deer Habitat



Range Trend Studies

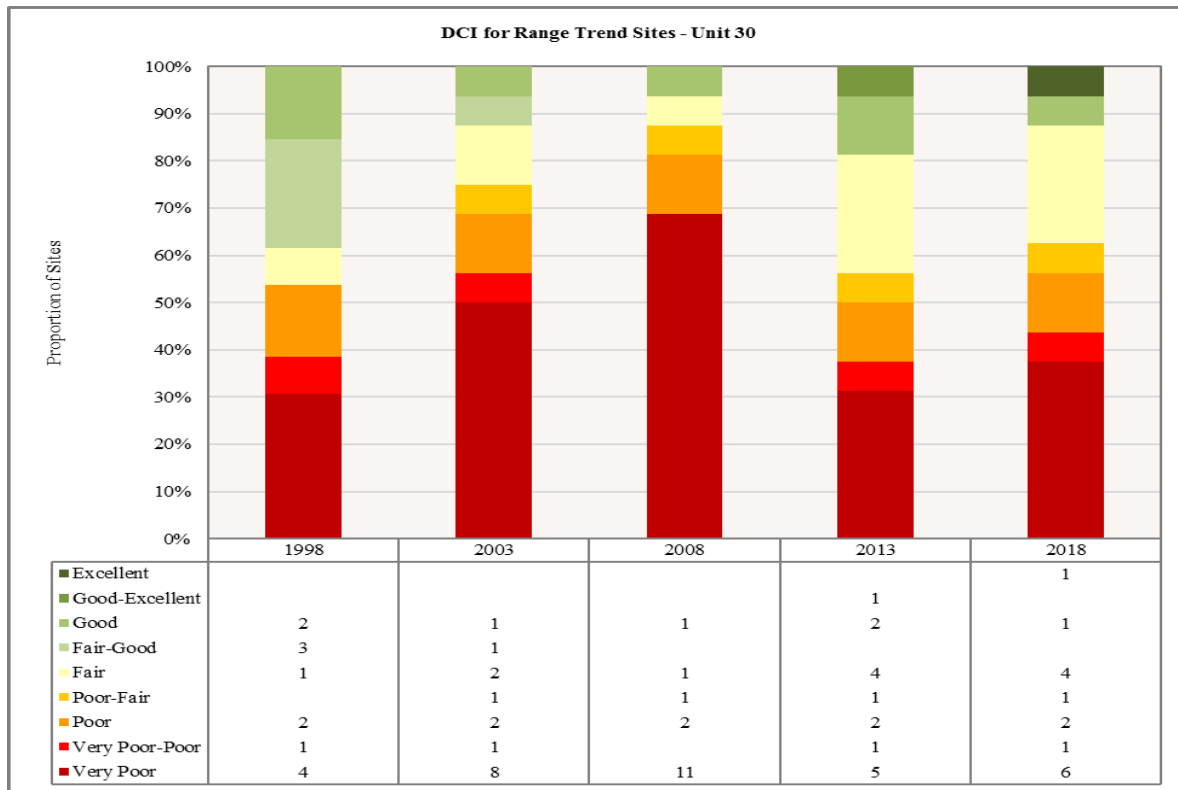
Range Trend studies have been sampled within WMU 30 on a regular basis since 1982, with studies being added or suspended as was deemed necessary (see full report or online report for a comprehensive list of study areas). Several of the range trend studies have been suspended over the sample years. Due to changes in sampling methodologies, only data sampled following the 1998 sample year are included in this summary. Monitoring studies of WRI projects have been sampled since 2004. When possible, WRI monitoring studies are established prior to treatment and sampled on a regular basis following treatment.

Range Trend studies that have not had recent disturbance or treatments are summarized in this report by ecological site or potential. Range Trend and WRI studies that have a disturbance or treatment during the reported sample period are summarized by the disturbance or treatment type. For a comprehensive report for each treatment type associated with the range trend site please refer to the full report. The full report can be viewed at the UDWR's regional office in Cedar City, Utah or at the UDWR Headquarters in Salt Lake City. An online version of the report will become available and currently you can access most of the results online at:

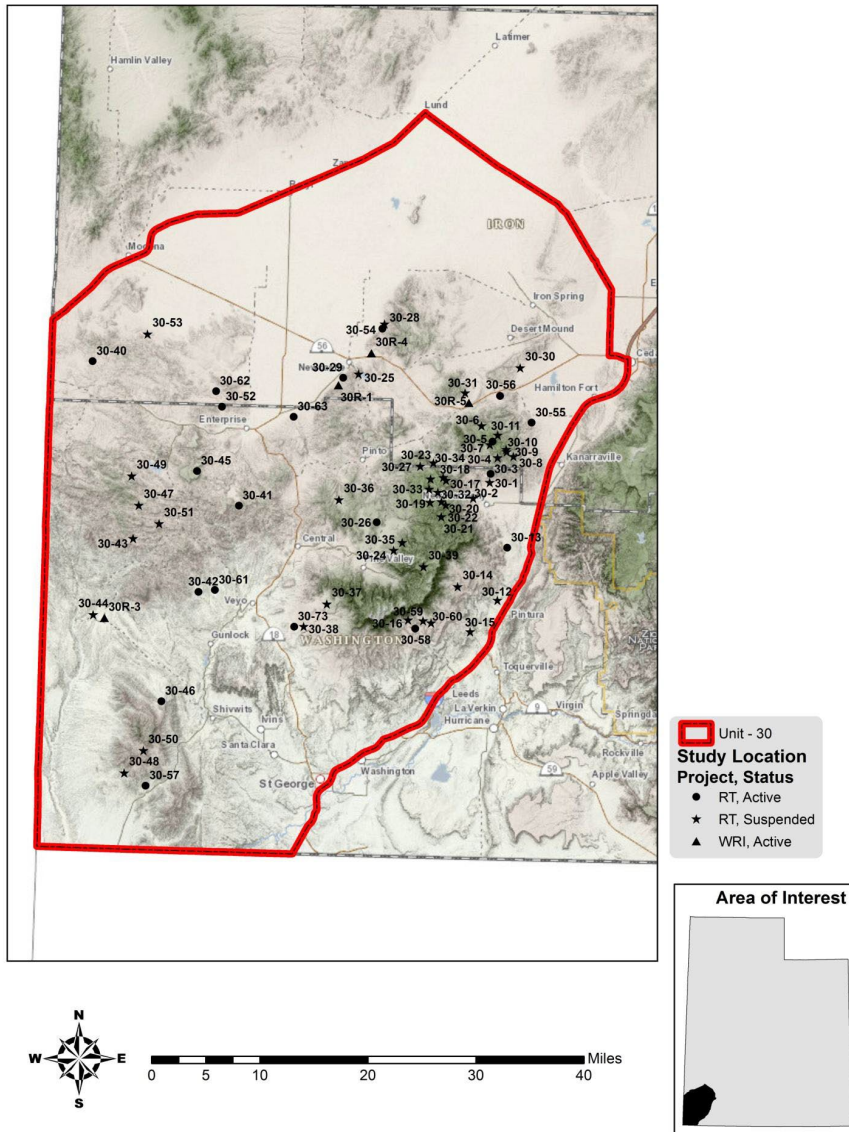
https://wildlife.utah.gov/.../range-trends/.../2018_Southern_Region_Unit_Summary_Report.pdf

Deer Winter Range Condition Assessment

The condition of deer winter range within the Pine Valley management unit has continually changed on the sites sampled since 1998. The active Range Trend sites sampled within the unit are considered to be in very poor to excellent condition as of the 2018 sample year. The Upper Broad Hollow study improved to excellent condition, and the Spirit Creek South Burned study stayed in good condition. There were four studies considered to be in fair condition, and these are Black Ridge, Motoqua, Tobin Bench, and Pahcoon Bench West. The Quichapa Canyon study was considered to be in poor-fair condition. The Telegraph Draw and North Hills studies were classified as being in poor condition. The Bullion Canyon study site was considered to be in very poor-poor condition. A total of six studies were classified as being in very poor condition: Southwest of Newcastle, Grapevine Spring, Holt Canyon, Wide Canyon 2, Pinion Park and Swett Hills North. These sites were considered very poor due to lack of preferred browse, lack of perennial vegetation cover, and high loads of annual grass.



Range Trend Study Locations – Long Term and WRI



Conditions and Recommendations

Mountain (Big Sagebrush)

The studies that are classified as a Mountain (Big Sagebrush) ecological site are considered to be in poor to good condition for deer winter range on the Pine Valley Unit. In general, these ecological communities support good shrub populations that can provide valuable browse for wildlife. Introduced perennial grasses are present on some of these study sites, and can lead to reduced understory diversity and productivity. Introduced annual grasses are also present in low amounts. Should these annual grasses increase in the future, they may change plant community dynamics and increase fuel loads. High fuel loads can lead to increased wildfire regimes. Monitoring of areas with introduced perennial and annual grasses is recommended. If these grasses increase consistently, treatments for their reduction may be needed. If reseeding is necessary to restore herbaceous species, care should be taken in species selection and native species should be given preference when possible.

The Telegraph Draw and Spirit Creek South Burned studies have some pinyon-juniper encroachment occurring, which has the potential for reduced understory and shrub vigor. It is recommended that tree-removing disturbances (e.g. bullhog, chaining, lop and scatter, etc.) take place in areas where conifer reduction would be feasible and beneficial. Care should be taken to select methods that will not increase annual grass cover.

Mountain (Browse)

The study within the Mountain (Browse) ecological type is considered to be in fair condition for big game summer range on this unit. This study supports a robust shrub community that may provide valuable forage for wildlife. Limited pinyon-juniper encroachment is occurring on this study and may eventually lead to reduced understory and shrub vigor. Treatments to reduce conifer encroachment (e.g. bullhog, chaining, lop and scatter, etc.) may be needed in the future.

Introduced perennial grasses are present in moderate amounts on this study site. High levels of these introduced grasses may lead to reduced understory diversity and productivity. In addition, annual grass contributes a low amount of cover on this site. Should introduced annual species increase in the future, they have the potential to shift the dynamics of the plant community and lead to less biodiversity. In addition, fuel loads are increased with high levels of annual grass, which in turn are associated with more frequent wildfires. If reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

Mountain (Curleaf Mountain Mahogany)

The study that is classified as a Mountain (Curleaf Mountain Mahogany) ecological site supports shrub populations which provide browse for summering big game animals. Introduced annual grasses are present in low amounts. Should future increases occur, higher amounts of annual grasses have the potential to increase fuel loads and exacerbate the risk of wildfire. This site is further threatened by the presence of introduced perennial grasses. Although the threat they pose is currently low, these introduced grasses can lead to diminished understory productivity and diversity if they increase in the future. If reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

Conifer encroachment is also occurring on this study site in low amounts. Although tree density is low as of 2018, tree-removing disturbances (e.g. bullhog, chaining, lop and scatter, etc.) may be appropriate if conifers increase in the future. Care should be taken to select methods that will not increase annual grass cover.

Mountain (Oak)

These Mountain (Oak) ecological sites are considered to be in good condition for deer summer range on the Pine Valley Management Unit. Annual grasses have been observed in varying amounts on these sites. Increased levels of annual grasses may exacerbate fuel loads, which in turn have the potential to increase fire intervals. It is recommended that monitoring of these studies continue; if these grasses are observed in consistently high amounts in the future, treatment(s) to restore the herbaceous understory may be necessary. In addition, noxious weeds have been observed in the past on the Flat Top Mountain study. Although their presence was not noted in 2013 or 2018, these noxious weeds may have the potential to outcompete native herbaceous species if they increase in future sample years.

Upland (Big Sagebrush)

The studies classified as Upland (Big Sagebrush) ecological sites are considered to be in very poor to fair condition for deer winter range on this management unit. The plant communities that are considered to be of this ecological type support sagebrush that provides browse for wintering big game animals. Annual grasses are present on many of these study sites in high amounts. Increased levels of annual grasses can exacerbate fuel loads and may alter the fire regime. Introduced perennial grasses pose a high-level risk on the Pahcoon Bench West study: high amounts of these grasses may lead to reduced understory diversity and productivity. It is recommended that monitoring of these studies continue; if these grasses are observed in consistently high amounts in the future, treatment(s) to restore the herbaceous understory may be necessary. If reseeding is necessary to restore herbaceous species, care should be taken in species selection and preference should be given to native grass species when possible.

Pinyon-juniper encroachment is also occurring on most of these study sites and may lead to reduced understory and shrub productivity. Tree-removing disturbances (e.g. bullhog, chaining, lop and scatter, etc.) are recommended in areas where they would be beneficial and appropriate. However, care should be taken to select methods that will not increase annual grass cover.

Upland (Black/Low Sagebrush)

These lower elevation Upland (Black/Low Sagebrush) ecological sites are classified as being in very poor-poor to fair condition for deer winter range on this management unit. These sites support robust sagebrush populations that provide valuable forage for wintering big game. Pinyon and juniper encroachment pose medium-level threats to these study sites, as they have the potential to reduce understory and shrub productivity as encroachment progresses. When and where appropriate, tree-removing disturbances such as bullhog and chaining may be beneficial.

Annual grasses are also present on these studies, posing a low-risk threat on the Black Ridge site and a high-risk threat on the Bullion Canyon study. High amounts of annual grasses can increase fuel loads and can potentially exacerbate the risk for wildfire. Monitoring should continue on these study sites and treatment may be necessary if high amounts of annual grasses persist in the future.

Upland (Shrub Liveoak)

The studies classified as Upland (Shrub Liveoak) ecological sites are considered to be within very poor to excellent condition for deer winter range within the Pine Valley Management Unit. More specifically, Upper Broad Hollow (30-03) is in excellent condition, while Grapevine Spring (30-42) is considered to be in very poor condition. Annual grasses pose a high-risk threat on the Upper Broad Hollow study and a low threat on the Grapevine Spring study site. Increased amounts of these grasses elevate fuel loads and may exacerbate the risk of catastrophic wildfire. If consistently high levels of annual grasses are observed in future sample years, treatment may be necessary to restore the herbaceous understory.

Encroachment of pinyon and juniper trees is an additional threat to both of these sites. Although the risk posed is currently ranked as medium, there may be potential for further encroachment in the future. As these pinyon-juniper woodlands progress in the phases of woodland succession, they have the potential to reduce the health and productivity of the understory and shrub components. Tree-removing disturbances (e.g. lop and scatter, bullhog, chaining, etc.) may be advisable in appropriate areas.

Semidesert (Desert Bitterbrush)

Tobin Bench (30-61), the study classified as a Semidesert (Desert Bitterbrush) ecological site, is classified as being in fair condition for mule deer winter range in this unit. This study supports shrub communities that provide valuable browse for wildlife. The existing herbaceous understory on this site is fairly degraded, and most of the graminoid cover is provided by the introduced perennial species crested wheatgrass (*Agropyron cristatum*) and annual species cheatgrass (*Bromus tectorum*). Introduced perennial grasses have the potential to outcompete native species for resources, therefore causing decreased understory diversity and productivity. In sufficient amounts, annual grasses can change plant community dynamics and increase fuel loads. High fuel loads, in turn, have the potential to alter wildfire regimes. If these grasses increase consistently, treatments for their reduction may be needed. Should reseeding be necessary to restore herbaceous species, care should be taken in species selection and native species should be given preference when possible.

Semidesert (Blackbrush)

The Motoqua (30-44) study site is considered to be a Semidesert (Blackbrush) ecological site and is classified as being in fair condition for deer winter range in this management unit. The shrub component on this site provides valuable browse for wildlife. Annual grasses are abundant on this site; increased annual grass levels can increase fuel loads and exacerbate the risk of wildfire. It is recommended that monitoring continue. If these grasses persist, treatments to restore the herbaceous understory may be beneficial.

Juniper encroachment is occurring on this study site. Although the study site is only in Phase I of woodland succession, tree-removing disturbances (bullhog, lop and scatter, chaining, etc.) may be beneficial. Over time, continued tree encroachment can lead to reduced understory and shrub productivity.

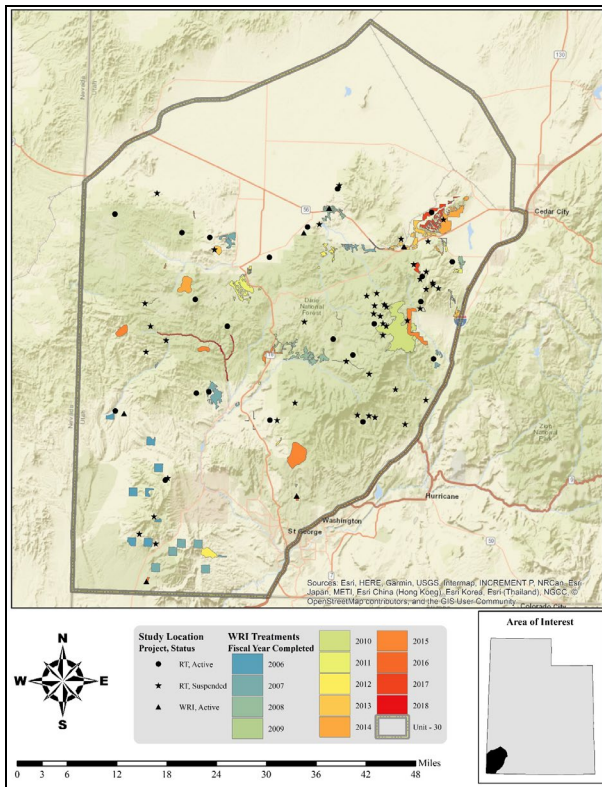
Treatments/Restoration Work

There has been an active effort to address many of the limitations on this unit through the Watershed Restoration Initiative (WRI). A total of 45,861 acres of land have been treated within the Pine Valley unit since the WRI was implemented in 2004 (**Map 9.7**). An additional 1,113 acres are currently being treated and treatments have been proposed for 6,173 acres. Treatments frequently overlap one another bringing the total treatment acres to 53,147 acres for this unit (**Table 9.6**). Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Seeding plant species to supplement the herbaceous understory is the most common management practice in this unit and often occurs along with other treatment types. Bullhog treatments and manual vegetation removal techniques (such as lop and scatter) to remove pinyon and juniper trees are also frequently used in the unit. Other management practices include (but are not limited to): seeding plants to enhance the shrub component, anchor chaining to remove trees, harrowing, and herbicide application (**Table 9.6**).

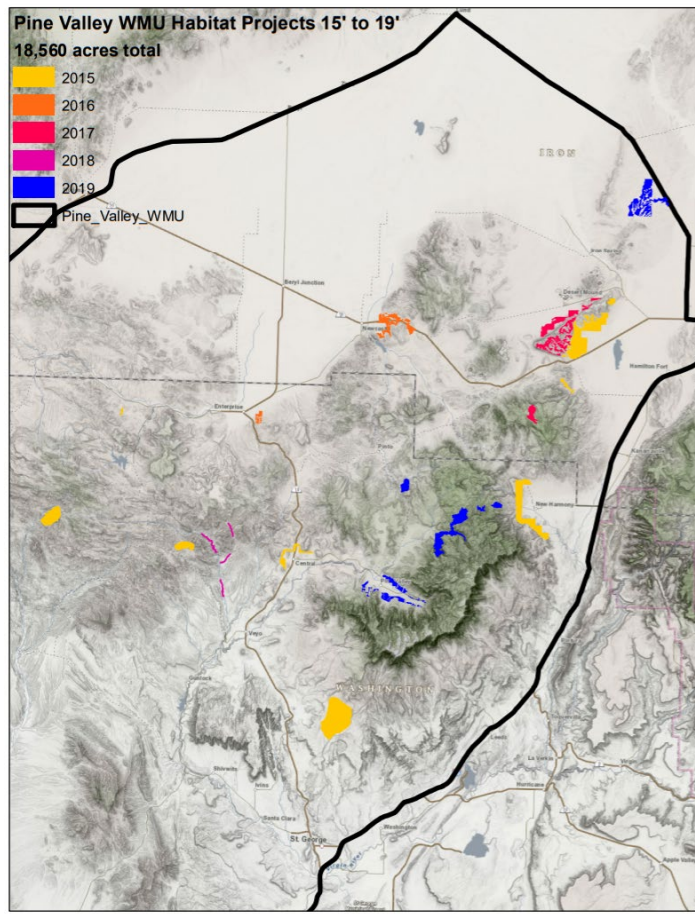
Type	Completed Acreage	Current Acreage	Pending Completed Acreage	Proposed Acreage	Total Acreage
Anchor Chain	3,758	0	0	0	3,758
Ely (One-Way)	1,123	0	0	0	123
Ely (Two-Way)	2,635	0	0	0	2,635
Bulldozing	40	0	0	0	40
Tree Push	40	0	0	0	40
Bullhog	9,270	47	0	5,319	14,636
Full Size	4,200	0	0	3,008	7,208
Skid Steer	5,070	47	0	2,311	7,428
Chain Harrow	0	0	0	14	14
>15 ft. (Two-Way)	0	0	0	14	14
Harrow	774	0	0	0	774
≤15 ft. (One-Way)	774	0	0	0	774
Herbicide application	749	0	0	0	749
Aerial (Fixed-Wing)	131	0	0	0	131
Aerial (Helicopter)	644	0	0	0	644
Planting/Transplanting	200	0	0	0	200
Seeding (Primary)	29,083	0	0	0	29,083
Broadcast (Aerial-Fixed Wing)	15,914	0	0	0	15,914
Broadcast (Aerial-Helicopter)	10,210	0	0	0	10,210
Drill (Rangeland)	123	0	0	0	123
Ground (Mechanical Application)	2,836	0	0	0	2,836
Seeding (Secondary/Shrub)	3,601	300	0	0	3,901
Broadcast (Aerial-Fixed wing)	108	0	0	0	108
Broadcast (Aerial-Helicopter)	508	300	0	0	508
Hand Seeding	2,985	0	0	0	2,985
Vegetation Removal/Hand Crew	3,656	841	0	1,764	6,261
Lop & Scatter	3,656	841	0	1,764	6,261
Other	275	0	0	0	275
Greenstripping	264	0	0	0	264
Road Decommissioning	11	0	0	0	11
Grand Total	51,406	1,235	0	7,097	59,691
* Total Land Area Treated	45,861	1,113	0	6,173	53,147

Table 9.1: WRI treatment action size (acres) for completed, current, and proposed projects for WMU 30, Pine Valley. Data accessed on 02/18/2019. *Does not include overlapping treatments.



Map 9.1: WRI treatments by fiscal year completed for WMU 30, Pine Valley.

2015 – 2019 Habitat Project Areas



DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 15
Henry Mountains
September 2020

BOUNDARY DESCRIPTION

Garfield, Kane and Wayne counties—Boundary begins on SR-95 at a point two miles south of Hanksville; south on SR-95 to Lake Powell; south along the west shore of Lake Powell to SR-276 at Bullfrog; north on SR-276 to the Burr Trail-Notom road; north on this road to the Capitol Reef National Park boundary; north on this boundary to the Burr Trail-Notom road at The Narrows and Divide Canyon; north on this road to a point two miles south of SR-24; east along a line that is two miles south of SR-24 to SR-95. EXCLUDES ALL NATIONAL PARKS. USGS 1:100,000 Maps: Escalante, Hanksville, Hite Crossing, Loa.

LAND OWNERSHIP

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Bureau of Land Management	26,714	80%	32,507	85%	263,516	88%
Private	3,848	11%	1,362	4%	6,492	2%
Utah State Institutional Trust Lands	3,029	9%	4,396	11%	31,001	10%
UDOT	0	0%	0	0%	27	<1%
TOTAL	33,591	100%	38,265	100%	301,036	100%

UNIT MANAGEMENT GOALS

Expand and improve the Henry Mountain (HM) mule deer population within the available habitat while considering other land uses. Set a realistic and attainable population objective that is below biological carrying capacity.

Manage the deer population in a Premium Limited Entry (PLE) unit capable of providing a broad range of recreational opportunities, including hunting and viewing.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size - Population objective of 2700 wintering deer. This objective can be raised or lowered in future years depending on habitat and climate conditions, deer body condition, herd productivity, and overall survival.

Data from the 10 years previous to 2015 indicated an increasing population trend, and the population objective was raised by 500 deer in 2015 to 2700. Since 2015 there has been a decreasing population trend (Table 1).

Deer survival inputs in the HM model are based on research from the adjacent San Juan unit. Research to obtain deer survival data is expensive. Therefore, representative units are selected that have similar characteristics to surrounding units. Depending on available funding, future efforts to conduct deer survival research on the HM would help understand how this deer herd

performs under high buck-doe ratios.

Modeling wildlife populations takes years of sufficient data to develop an accurate working model. Additional years of data will help refine the HM population model resulting in a better population estimate.

The population objective does not affect management of buck deer harvest on the HM unit. In the Utah Mule Deer Statewide Management Plan, PLE draw permits are set and based upon the average age of harvested bucks. For purposes of understanding population size, deer survival research is important but it does not guide current buck harvest objectives on this unit.

Herd Composition - Manage premium limited entry units for a 3-year average of 40-55 bucks per 100 does.

Harvest - Set permit numbers as outlined in the Utah Mule Deer Statewide Management Plan. PLE permits will be adjusted to maintain 40% of the harvested deer are 5 years and age and older. Management buck permits will be adjusted to maintain the buck/doe objectives at a 3-year average of 40-55 bucks per 100 does. Antlerless permits will only be issued to address specific localized crop depredation or range degradation concerns if necessary.

POPULATION MANAGEMENT STRATEGIES

Harvest

Premium Limited Entry - Hunting seasons will include three weapon types based on the following percentages: 20% archery, 20% muzzleloader, and 60% any weapon which includes a multi-season hunting opportunity that will allow 3% of the hunters to hunt all seasons. Baseline PLE permits for the public draw will be recommended at 49 PLE permits on the Henry Mountains. Reductions in permits will occur if <40% of the harvested bucks (3-year average) are 5 years of age or older to achieve the objective. And permit numbers will be returned to baseline numbers when the age objectives are being met.

Management Hunt - Provide a management buck hunt to allow additional hunting opportunity if the 3-year average exceeds the 40 bucks per 100 does. If the 3-year average buck-doe ratio exceeds 55 bucks per 100 does, management buck permits will be adjusted to bring the buck-doe ratio towards objective.

Additional strategies to increase the management buck harvest may need to be developed in order to lower the buck-doe ratio to the management objective. Other strategies may be considered to address perceptions of hunter crowding. The check-in requirement has created situations where conservation officers are regularly needed to determine if a harvested buck is a "management buck" by definition.

Monitoring

Population Size - A population estimate will be made using computer modelling based on fall and spring herd composition counts, harvest surveys, and mortality estimates. Current research from radio telemetry studies on the adjacent San Juan unit will be used as deer survival data for population models for this unit. The San Juan unit has similar topography, vegetation types, and weather patterns. Future efforts will be considered to conduct similar research on the Henry Mountains.

Buck/doe Ratios and Age Structure - Collect buck/doe and doe/fawn ratio data during fall and spring composition counts. Monitor age structure of bucks harvested by tooth analysis.

Harvest – Collect harvest data from the mandatory hunter harvest reporting surveys.

Research – Continue to collect annual adult doe and cause specific mortality on this unit from GPS collared deer. Continue research efforts to identify habitat use, migration corridors, and limiting factors for deer herd growth.

Table 1- Population Trends and Harvest for Unit 15 Henry Mountains

Year	PLE Buck Harvest	Mgt Buck Harvest	PLE Buck Avg. Age	PLE Buck % Age 5+	Fawns/ 100 does	Bucks/ 100 does	Post-Season Population	Doe Survival	Fawn Survival (San Juan)
2010	42	17	4.9	64%	62	59	1200	88	80
2011	44	29	5.0	63%	54	61	1400	76	83
2012	45	28	4.9	64%	74	52	1900	90	86
2013	46	28	6.2	89%	60	55	1800	86	79
2014	47	28	6.6	75%	81	48	2200	84	71
2015	43	25	6.2	76%	76	65	2400	80	71
2016	44	25	5.5	70%	65	47	2200	75	41
2017	50	25	5.3	68%	53	41	1900	73	6
2018	44	21	5.0	46%	38	44	1600	77	27
2019	46	9	5.3	54%	57	37	1000	-	-
average	45	24	5.5	67%	62	51	1760	81	60

Antlerless Harvest

Use antlerless harvest to locally reduce deer populations when range conditions, deer adult and fawn survival, fawn production, and deer body condition suggest the population is near carrying capacity.

Predator Management

Manage predators according to the predator management policy (W1AG-04) where habitat is not limiting and predators are demonstrated to have negative impacts on the population. Indices such as doe and fawn survival, body condition scores, fawn production, and cause specific mortality will be used to determine if predator management is deemed necessary. This unit is currently under predator management for bighorn sheep.

Private Lands Management

Support programs that increase tolerance for deer on private lands including LOA, CWMU, and Walk-In Access programs.

Address all depredation problems in a timely and efficient manner.

Disease Management

Investigate and manage diseases that threaten mule deer: Chronic Wasting Disease (CWD), Epizootic Hemorrhagic Disease (EHD), and others as outlined in the State Mule Deer Management Plan.

HABITAT MANAGEMENT OBJECTIVES

Protect, maintain, and/or improve deer habitat through direct range improvements to support and maintain herd population management objectives.

Work with private landowners and federal, state, and local governments to maintain and protect critical and existing ranges from future losses and degradation, through grazing management and OHV and Travel Plan modifications.

Work with federal, private, and state partners to improve crucial deer habitats through the WRI process.

Maintain and protect critical winter range from future losses. Acquire critical winter range when the opportunity arises.

Minimize and mitigate impacts from energy development activities.

Minimize deer vehicle collisions along highways on the unit if vehicle collisions become common.

HABITAT MANAGEMENT STRATEGIES

Continue to improve, protect, and restore sagebrush steppe habitats critical to deer. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, grazing management, water developments etc. on public and private lands. Habitat improvement projects will occur on both winter ranges as well as summer range.

Continue to monitor UDWR permanent range trend studies located throughout the unit to evaluate deer habitat health and trend based on important deer use areas.

Conduct cooperative seasonal range assessments to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.

Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of conservation easements, etc. on private lands.

Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.

Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities.

Continue to monitor deer survival on this unit. Use GPS data to determine potential habitat improvement projects.

Manage riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid to late summer.

Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by cheat grass with desirable perennial vegetation.

Reduce expansion of pinion-juniper woodlands into sagebrush habitats and improve habitats dominated by pinion-juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog, and chaining.

Utilize antlerless deer harvest to improve or protect forage conditions when vegetative declines are attributed to deer over utilization.

Treatments/Restoration Work

A total of 8,253 acres of land have been treated within the Henry Mountain unit since the WRI was implemented in 2004 (Map 4). Treatments frequently overlap one another bringing the total completed treatment acres for this unit to 12,590 acres (Table 2). Other treatments have occurred outside of the WRI through independent agencies and landowners, but the WRI comprises the majority of work done on deer winter ranges throughout the state of Utah.

Table 2- Total Habitat Treatments since 2004

Treatment Action	Acres
Anchor chain	72
Bullhog	791
Harrow	2,171
Roller Chopper	325
Application	
Seeding (primary)	3,510
Veg handcrew removal	5,721
Total Treatment Acres	12,590

Permanent Range Trend Summaries

Big Game Habitat

An estimated 373,850 acres are classified as deer range in the Henry Mountains management unit with 81% classified as winter range, 10% as summer range, and 9% as year-long range (Map 1). Summer range is the limiting habitat factor on this unit and should be monitored for overall range health. Summer habitat improvements should be a priority to improve deer herd health and population numbers. Wildfire has shown to be a great benefit on the Henry's summer range. While few fires have occurred, the ones that have burned have been large (Map 2). The Bulldog fire of 2003 was the largest fire in the unit at 31,753 acres, followed by the Lonesome Beaver fire of 2003 at 4,555 acres. The Lonesome Beaver fire occurred mainly on deer summer range and bison year-long range while the Bulldog fire occurred on deer summer and winter range and bison year-long range. In 2004 the BLM and the Utah Division of Wildlife Resources/WRI and partners went to work preparing the landscape to reduce erosion and reseeded. Above average precipitation came providing the circumstances for a great flush of new growth and established vegetation which has greatly impacted the mule deer herd for almost 2 decades.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Henry Mountain management unit has continually changed on the sites sampled since 1994. Severe drought through 2018 and again through the spring/summer/fall of 2020 has affected lower elevation habitat. Adequate 2019 winter precipitation and associated ground moisture from snow melt helped give plants needed nutrients for growth through spring 2020.

In 2019 the Desirable Components Index (DCI) indicates the condition of Range Trend sites across the unit having improved since 2004 (Figure 1, Map 3). The Desirable Components Index (DCI) was created as an indicator of the general health of big game (deer) winter ranges. The index incorporates shrub cover, density, and age composition as well as other key vegetation variables. Decreases in DCI can suggest that winter range capacity has decreased. The relationship between a decrease in DCI and the reduction of deer carrying capacity is difficult to quantify.

RECREATION OBJECTIVES

Provide high-quality mule deer hunting that encourages a variety of hunting opportunities while maintaining population objectives. In association with high quality hunting, provide high-quality mule deer viewing opportunities.

RECREATION STRATEGIES

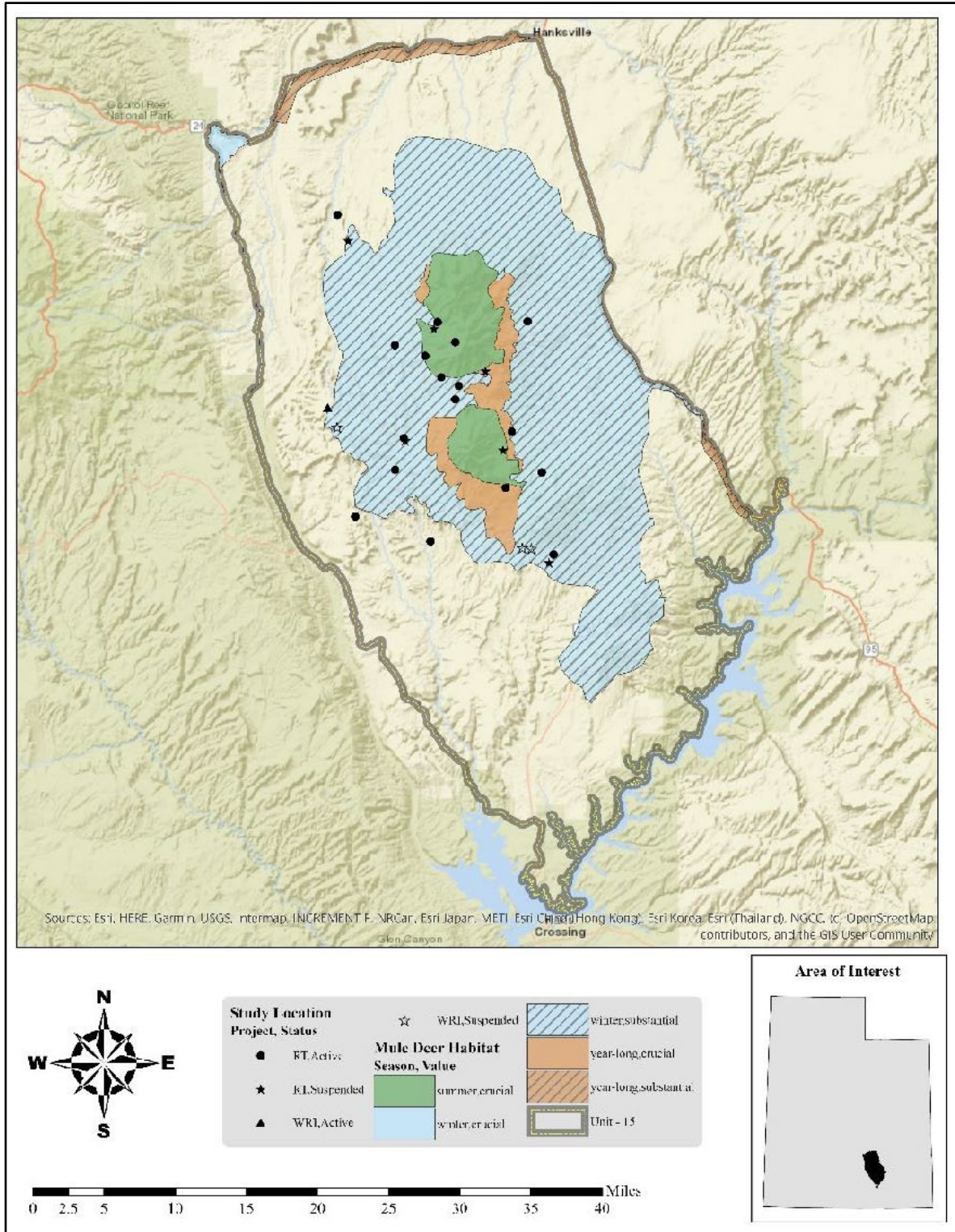
Recommend permits for archery 20%, muzzleloader 20%, and any weapon 60%. Alter these percentages when necessary to help achieve buck-to-doe ratio objectives.

Provide 3% opportunity for multi season hunting.

Recommend season lengths that provide adequate hunting opportunities.

Support outreach efforts to educate on mule deer management and conservation.

Map 1- Estimated mule deer habitat by season and value showing Range Trend Locations for WMU 15, Henry Mountains.



Map 2- Land coverage of fires by year from 2000-2019 for WMU 15, Henry Mountains (Geosciences and Environmental Change Science Center (GECSC) Outgoing Datasets, 2020).

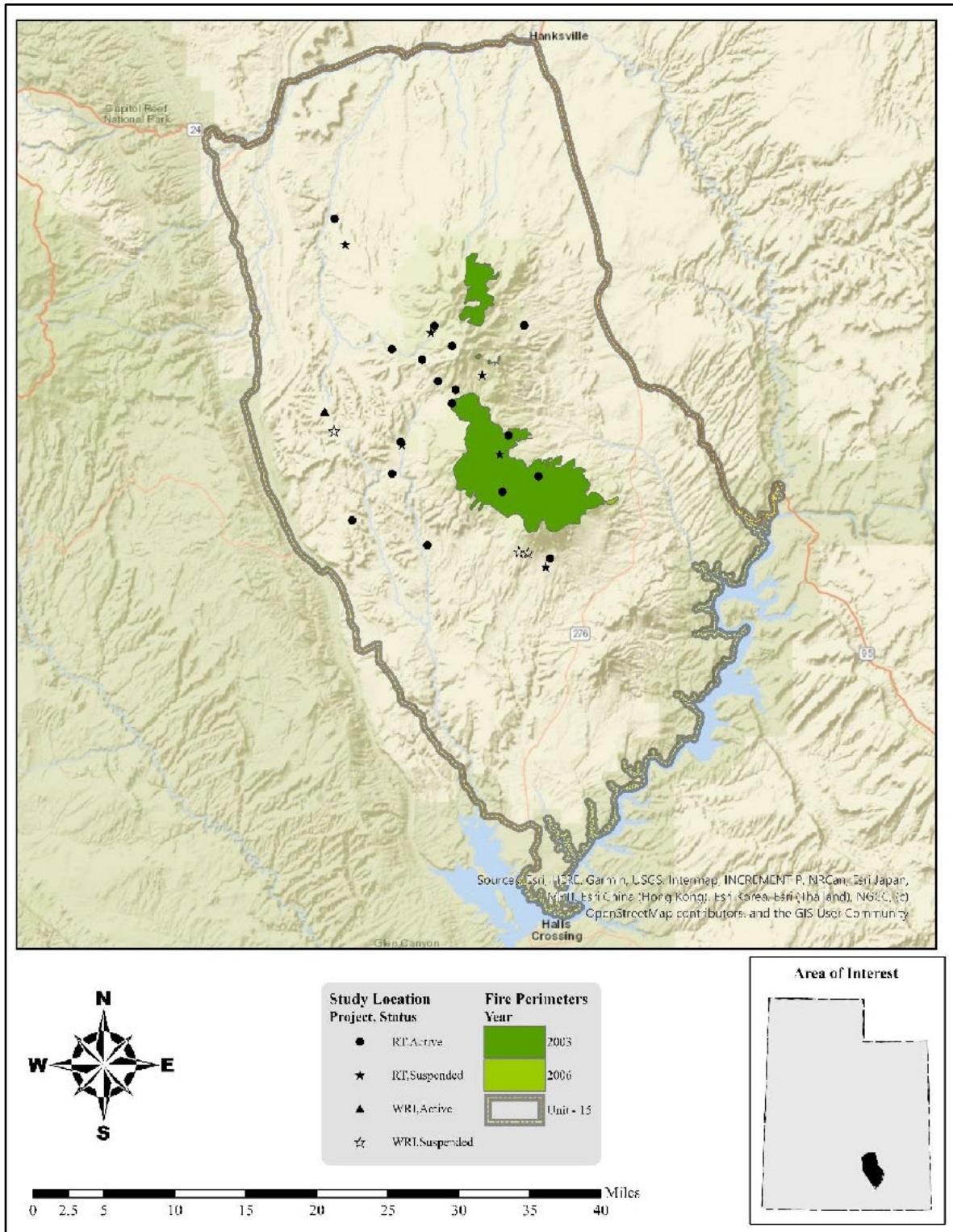
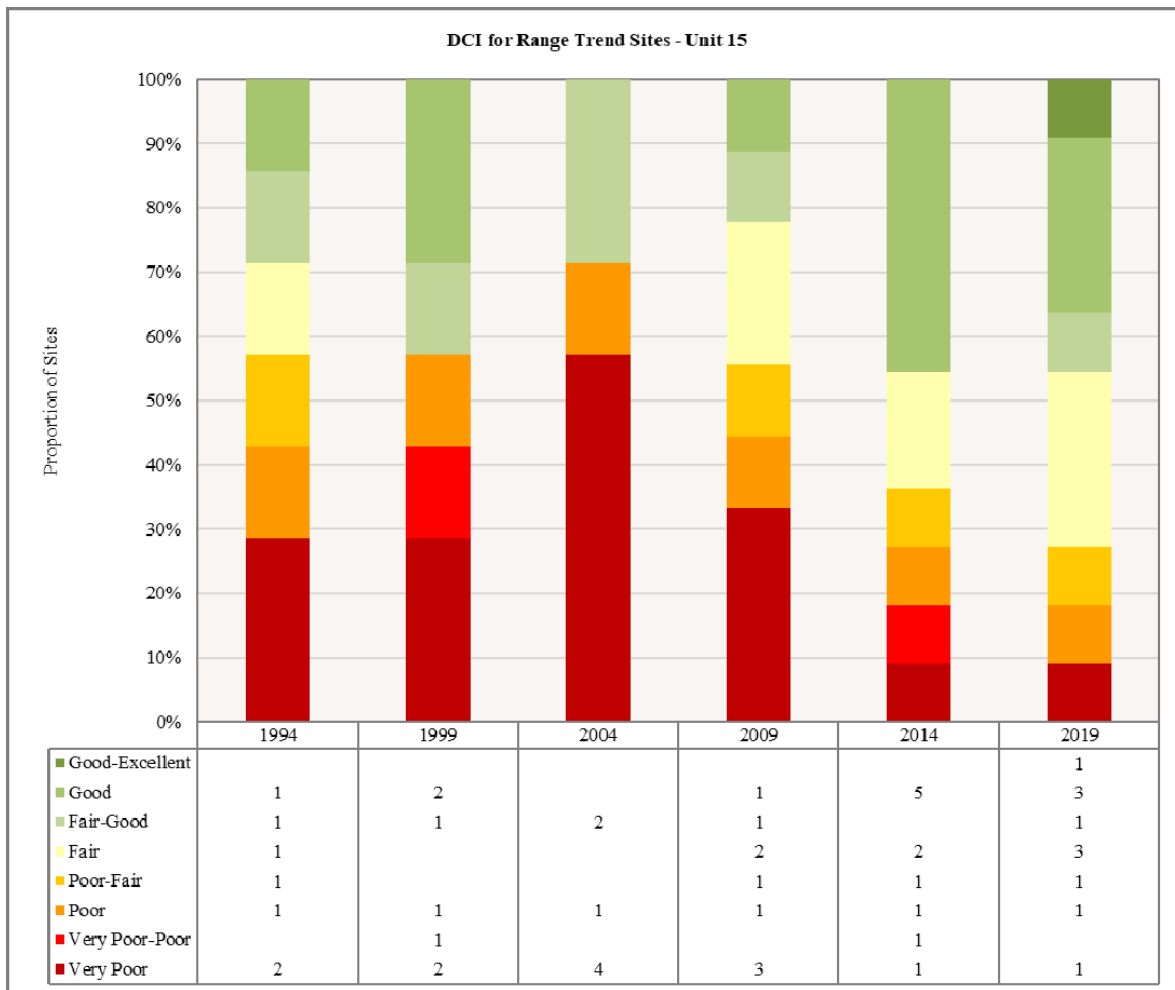
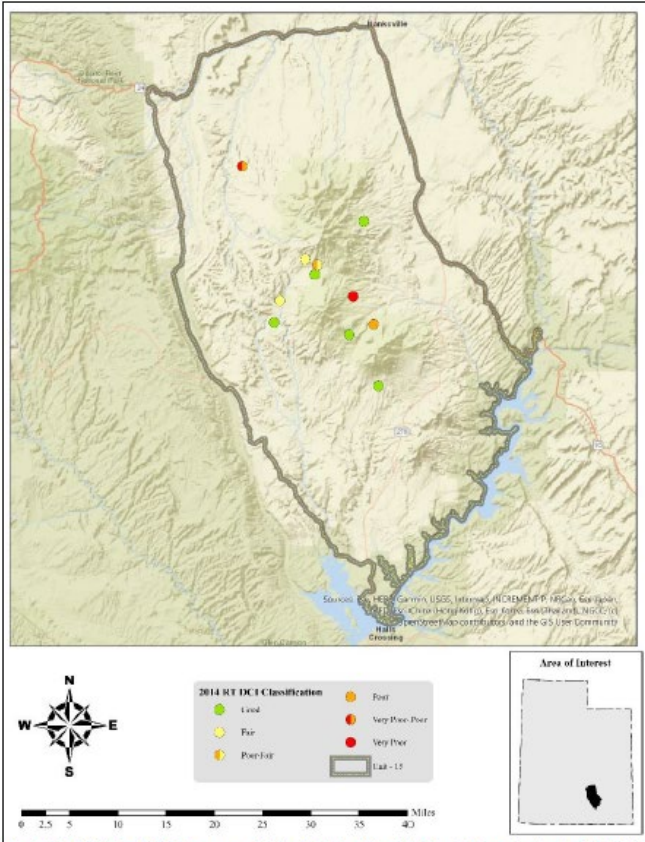


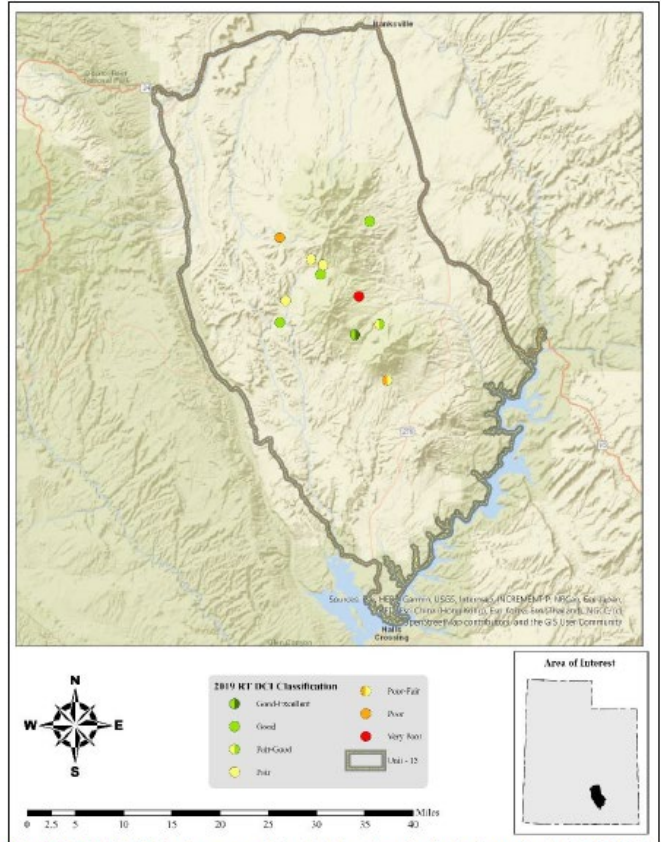
Figure 1. Henry Mountains Deer Winter Range Desirable Components Index (DCI) Showing Proportions of Range Sites in each Condition Class (Poor, Fair, Good, etc.) Overall the the condition of the sites have improved since 2004.



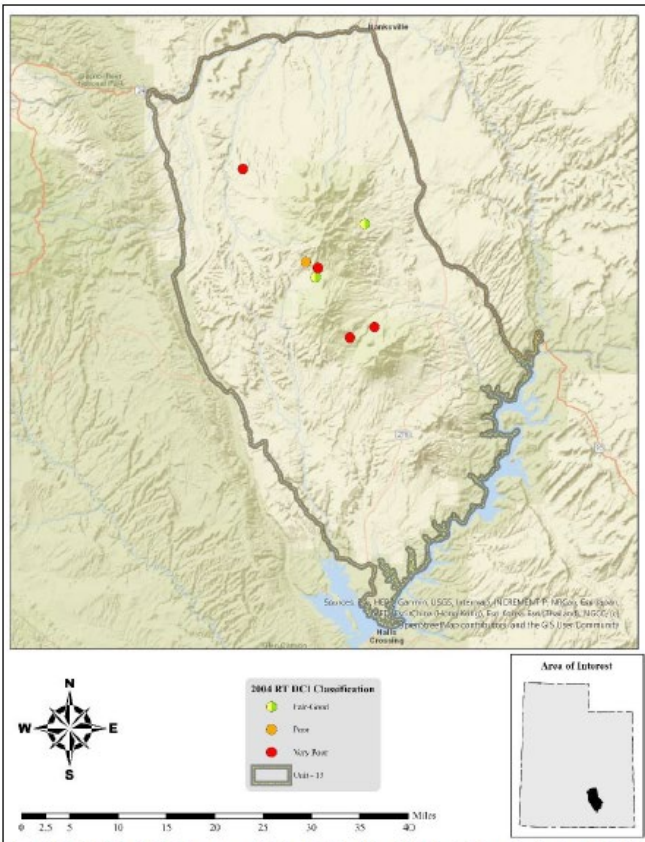
Map 3- Map of Range Trend Sites from 2004 to 2019 Showing DCI Condition for Each Site



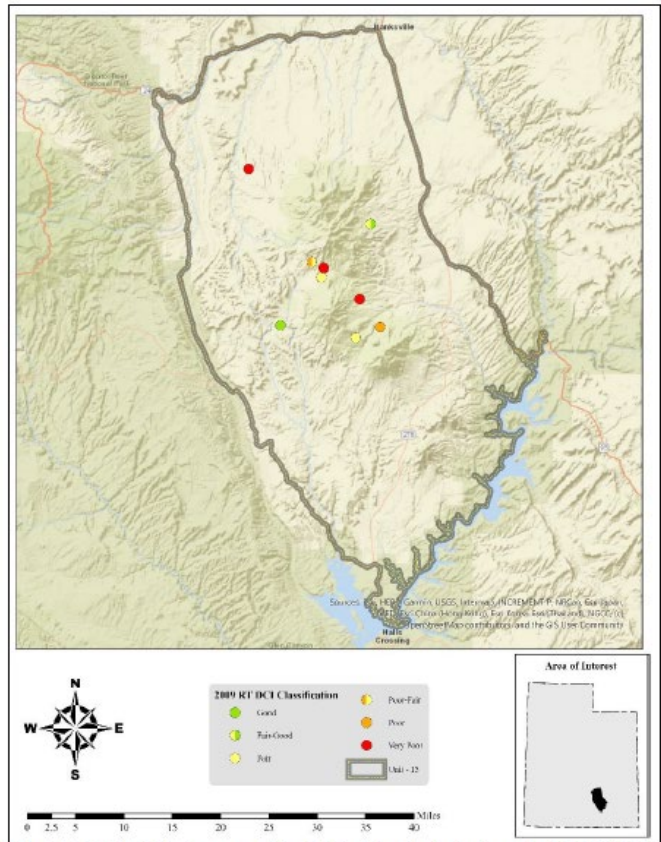
Map 3.14: 2014 Desirable Components Index (DCI) ranking distribution by study site for WMU 15, Henry Mountains.



Map 3.15: 2019 Desirable Components Index (DCI) ranking distribution by study site for WMU 15, Henry Mountains.



Map 3.12: 2004 Desirable Components Index (DCI) ranking distribution by study site for WMU 15, Henry Mountains.



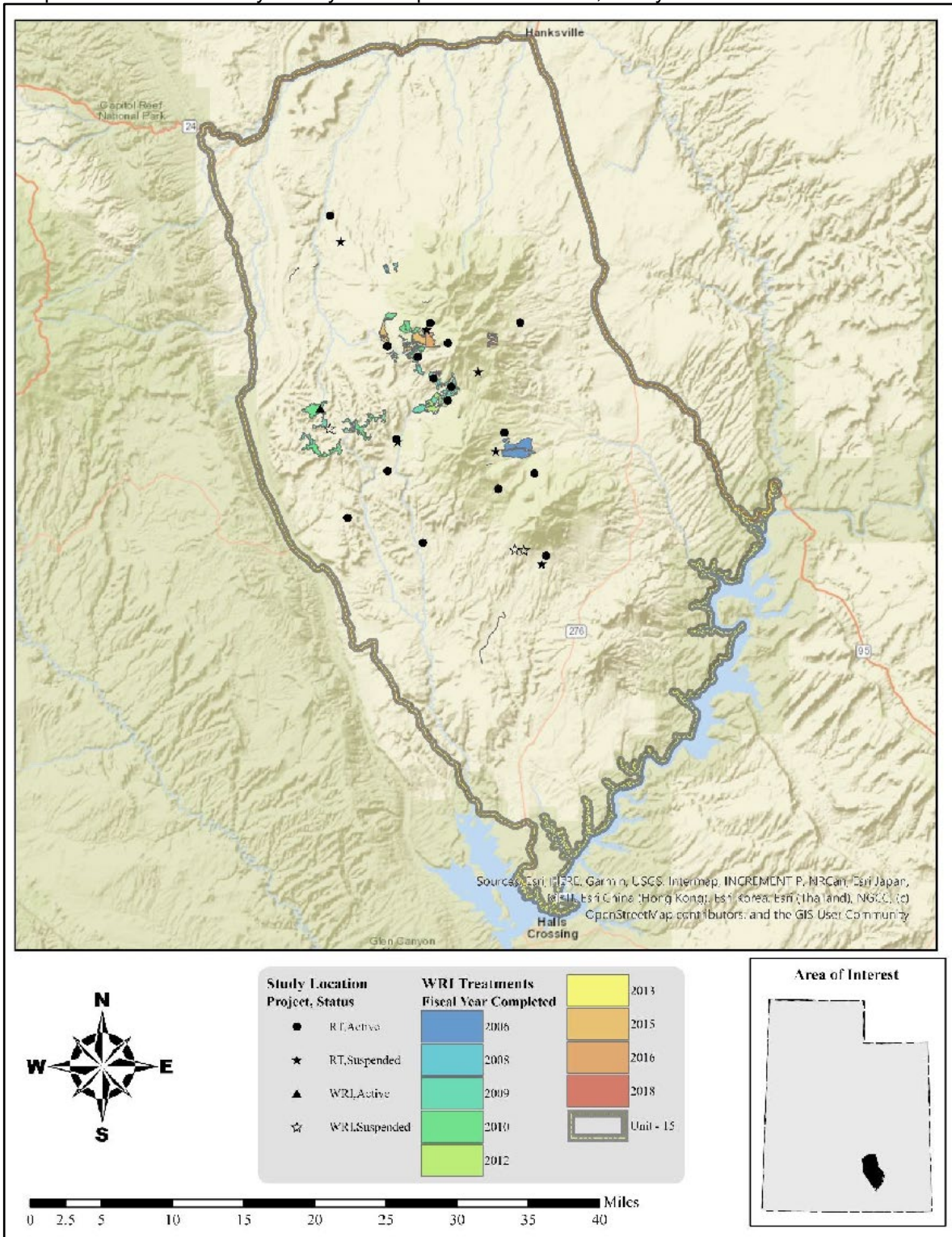
Map 3.13: 2009 Desirable Components Index (DCI) ranking distribution by study site for WMU 15, Henry Mountains.

Mule Deer Body Condition Data

Table 3- Body Fat Comparisons of Captured Deer, 2014-2019. Gold cell is low and blue high. Use the San Juan mule deer unit for reference, highlighted in **red**. The San Juan unit is the unit that is most like the Henry Mountain unit where body condition data is being researched.

Unit	Percent (%) Ingesta Free Body Fat (IFBF)					
	Dec 2014	Dec 2015	Dec 2016	Dec 2017	Dec 2018	Dec 2019
Box Elder						8.79
Cache		11.02	9.59	13.65	10.32	13.71
North Slope					8.59	
South Slope	11.31	9.46	9.00	9.56	7.24	9.90
Oquirrh-Stansbury	10.52	8.43	9.56	8.79	7.39	8.46
Chalk Creek/Kamas					7.19	11.02
<i>Wasatch-Manti</i>		8.76	9.22	10.23	9.32	11.11
Wasatch East						11.51
South Manti			8.87			9.42
Book Cliffs				7.56	6.35	8.80
West Desert					6.33	8.04
Monroe	8.10	8.98	8.23	9.53	6.50	10.37
Beaver						7.75
Boulder						8.54
Panguitch					8.76	8.64
Pine Valley		7.42	6.68	6.54	6.91	6.86
Zion					8.48	9.04
LaSal						8.63
San Juan		9.35	9.25	7.60	7.77	9.50
Statewide	9.98	9.06	8.80	9.18	7.78	9.45

Map 4- WRI treatments by fiscal year completed for WMU 15, Henry Mountains



DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 13
La Sal
September 2020

BOUNDARY DESCRIPTIONS

Grand and San Juan counties - Boundary begins at the junction of I-70 and the Green River; south on the Green River to the Colorado River; north on the Colorado River to Kane Springs Creek; southeast along this creek to Hatch Wash; southeast along this wash to US-191; south on US-191 to the Big Indian Road; east on this road to the Lisbon Valley Road; east on this road to the Island Mesa Road; east on this road to the Colorado State Line; north on this line to I-70; west on I-70 to the Green River.

This boundary includes two subunits including:

Subunit 13A - La Sal, La Sal Mountains - Grand and San Juan counties—Boundary begins at I-70 and the Green River; south along the Green River to the Colorado River; north along this river to Kane Springs Creek; southeast along this creek to Hatch Wash; south east along this wash to US-191; south on US-191 to Big Indian Road; east on this road to Lisbon Valley Road; east on this road to Island Mesa Road; east on this road to the Utah-Colorado state line; north on this state line to the Dolores River; northwest along this river to the Colorado River; northeast along this river to the Utah-Colorado state line; north on this state line to I-70; west on I-70 to the Green River.

Subunit 13B - La Sal, Dolores Triangle - Grand County - Boundary begins at the Utah-Colorado state line and the Colorado River; south along the state line to the Dolores River; northwest along the Dolores River to the Colorado River; northeast along this river to the Utah-Colorado state line.

LAND OWNERSHIP

Subunit 13A - La Sal, La Sal Mountains

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	104267	57%	36273	12%
Bureau of Land Management	20389	46%	2302	1%	212749	73%
Utah State Institutional Trust Lands	1203	3%	29227	16%	16915	6%
Private	2417	5%	46231	25%	25542	9%
Department of Defense	32	<1%	0	0%	0	0%
National Parks	17900	41%	0	0%	0	0%
Utah Department of Transportation	0	0%	0	0%	70	<1%
Department of Natural Resources	2065	5%	0	0%	194	<1%
TOTAL	44007	100%	182027	100%	291743	100%

Subunit 13B - La Sal, Dolores Triangle

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	0	0%	0	0%	0	0%
Bureau of Land Management	0	0%	0	0%	87718	87%
Utah State Institutional Trust Lands	0	0%	0	0%	9553	9%
Private	0	0%	0	0%	3514	4%
TOTAL	0	0%	0	0%	100785	100%

UNIT MANAGEMENT GOALS

Manage for realistic and attainable population management objectives that are below biological carrying capacity to maintain healthy and productive deer populations.

Manage the deer population at a level capable of providing a broad range of recreational opportunities, including hunting and viewing.

Balance deer herd goals and objectives with impacts on human needs, such as private property rights, agricultural crops and local economies.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size - Achieve a target population of 11,000 wintering deer (modeled number) during the five-year planning period.

Subunit	2015-2019 Objective	2020-2024 Objective
La Sal Mountains	13,000	8,000
Dolores Triangle	5,100	3,000
UNIT TOTAL	18,100	11,000

These objectives are not necessarily the carrying capacity nor long-term objectives. Deer populations will be assessed annually using the monitoring strategies outlined below to determine the current population status and their relationship to carrying capacity. Deer populations can be very dynamic depending on a number of factors that can change carrying capacity. Deer objectives can be adjusted based on range condition and trend assessments, as well as deer body condition, productivity and survival trends. Improvements in computer population modeling has provided better estimates of current deer numbers which will aid in setting population objectives that are more realistic and attainable.

La Sal Mountains – A reduction in population objective to 8,000 deer will be implemented in 2020.

The previous population objective was derived using harvest data from the 1980's when deer populations were at a high. Given current climate trends and low fawn productivity largely due to prolonged drought periods (Table 1 and Figure 1), the previous objective is likely not an attainable objective for the life of this plan. Projecting the population 5 years into the future using current computer modeling and averaging survival, harvest and classification data from the past 10 years yields a population estimate of 6,500 deer. Considering the moderate body condition score of deer this past winter (Table 2) and acknowledging that biological measurements may increase above the average values used in the model, it is suggested that an obtainable population objective for the La Sal Mountains would be 8,000 deer, which allows for herd growth of 2,900 deer over the next 5 years.

Dolores Triangle – A reduction in population objective to 3,000 deer will be implemented in 2020. This subunit is largely managed based on management actions and total population estimates from Colorado Division of Parks and Wildlife (CDPW). The Utah portion of the Dolores Triangle is a relatively small management unit and encompasses only a portion of the winter range for deer from Colorado's Unit #40. Utah's population estimate for the subunit is based on CDPW models of unit #40. Population trend estimates has shown that this subunit has never been closer than 52% of the previous objective of 5,100. Based on the CDPW unit #40 population objective, an obtainable population objective for the Dolores Triangle would be 3,000 deer, which allows for herd growth of 1,080 deer over the next 5 years. Given the very conservative permit levels that are issued for the Utah portion of the subunit, harvest will have negligible effects on this population.

Herd Composition

La Sal Mountains - Manage for a buck to doe ratio of 15-17 bucks per 100 does, in accordance with the statewide plan. Biologists will take into account current year buck/doe ratio, 3 year average buck/doe ratio and trend as well as fawn and adult survival when making permit recommendations.

Dolores Triangle - Manage for a buck to doe ratio of 25-35 bucks per 100 does, in accordance with the statewide plan. Biologists will take into account current year buck/doe ratio, 3 year average buck/doe ratio and trend as well as fawn and adult survival when making permit recommendations.

Harvest

La Sal Mountains - Continue General Season Unit by Unit buck deer hunt regulations, using archery, any weapon, and muzzleloader hunts. Antlerless removal may be implemented if needed to maintain the population below carrying capacity and to address specific localized crop depredation, range degradation or urban conflict concerns, using a variety of harvest methods and seasons.

Dolores Triangle - Continue Limited Entry buck deer hunting strategy to maintain herd composition objectives and quality hunting opportunities. Antlerless removal may be implemented if needed to maintain the population below carrying capacity and to address specific localized range degradation issues.

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size -

La Sal Mountains - Population estimates will be made based on fall and spring herd composition

counts conducted by biologists, survival and body condition data from GPS collared deer, and hunter harvest data. These data will be used in computer models to determine a winter deer herd population size. The modeled population estimate for the winter of 2020 was 5,100 deer on the La Sal Mountains subunit.

Dolores Triangle - Deer population will be modeled by the Colorado Division of Parks and Wildlife as part of their Unit #40 deer herd. About 40% of this herd winters in Utah; therefore, 40% of Colorado's population estimate for Unit #40 was used as Utah's population estimate. The modeled population estimate for the winter of 2020 was 1,920 deer on the Dolores Triangle subunit.

Buck/doe ratios and Age Structure - Monitor age class structure of the buck population through the use of check stations, postseason classification, uniform harvest surveys and field bag checks.

Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey and the use of check stations.

Research – Continue to utilize GPS data from remaining collared deer on the La Sal Mountains to collect annual adult survival rates and cause specific mortality. Continue GPS collar survival study on regional representative unit (San Juan) to collect annual adult and fawn survival rates, body condition scores and cause specific mortality. Seek out and support opportunities to capture additional deer on the La Sal Mountains to further investigate herd survival, body condition scores, cause specific mortality and movement. Also, consider cooperating with Colorado Division of Parks and Wildlife in initiating a black bear predation study.

Table 1. Population and Harvest Trend data for the La Sal Mountains (top) and Dolores Triangle (bottom).

Population Trends and Harvest for the La Sal, La Sal Mountains (13a) Deer Subunit

Year	Buck harvest	Permits	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2015	521	1,800	46	18	7,000	13,000	54%
2016	588	1,800	47	17	7,100	13,000	55%
2017	589	1,800	24	11	5,300	13,000	41%
2018	527	1,600	22	17	5,100	13,000	39%
2019	463	1,600	34	17	5,100	13,000	39%
5 Year Avg	538	1,720	35	16	5,920		

Population Trends and Harvest for the La Sal, Dolores Triangle (13b) Deer Subunit

Year	Buck harvest	Permits	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2015	15	20	64	45	2,300	5,100	45%
2016	18	20	40	24	1,900	5,100	37%
2017	14	20	56	42	-	5,100	-%

2018	18	20	28	28	1,920	5,100	38%
2019	16	17	41	33	1,920	5,100	38%
5 Year Avg	16	19	46	34	-		

Antlerless Harvest

Use antlerless harvest to locally reduce deer populations when range conditions, deer adult and fawn survival, fawn production, and deer body condition suggest it is necessary.

Use antlerless harvest in combination with the Urban Deer Rule to reduce nuisance and depredation by deer.

Predator Management

Manage predators according to the predator management policy (W1AG-04) where habitat is not limiting and predators are demonstrated to have negative impacts on the population. Indices such as doe and fawn survival, population growth rate, body condition scores, fawn production, and cause specific mortality will be used to determine if predator management is deemed necessary.

Private Lands Management

Support programs that increase tolerance for deer on private lands including CWMU, landowner permits, and Walk-In Access programs.

Address all depredation problems in a timely and efficient manner.

Disease Management

Investigate and manage diseases that threaten mule deer populations and continue monitoring for chronic wasting disease (CWD) as stated in the Statewide plan. The La Sal Mountains subunit is a CWD positive unit, displaying the highest prevalence rates in the state and has increased from 7.9% to 14.1% over the past 5 years (Figures 2 & 3).

CWD Strategies

- Utilize rotational hunter harvest surveillance, targeting this unit once every several years.
- Consider compulsory testing of hunter harvested deer to increase sample size.
- Consider managing the unit toward the lower end of the buck/doe objective to minimize increase of the disease.
- Consider late season buck hunts in focal hotspots on the unit to minimize disease transmission.
- Educate public and enforce rules regarding carcass importation and disposal from CWD positive areas.

Urban Deer Management

Work with municipalities on localized urban deer control management actions. Work cooperatively with municipalities in developing urban deer management plans, within the guidelines set by state law and agency policies.

HABITAT MANAGEMENT OBJECTIVES

Maintain or improve mule deer habitat on the unit by protecting, maintaining, and enhancing existing crucial habitats and mitigating losses due to natural and human impacts.

Minimize deer vehicle collisions along highways on the unit by working cooperatively with UDOT.

HABITAT MANAGEMENT STRATEGIES

Continue to improve, protect, and restore summer and winter range habitats critical to deer, such as aspen and sagebrush steppe communities. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, mechanical treatments, grazing management, water developments etc. on public and private lands. Habitat improvement projects will occur through the WRI process. Projects completed to date are summarized in Table 3.

Continue to work with and support Universities and land management agencies on habitat research projects. Continue to stay apprised on the joint sagebrush restoration project between BLM and DWR on Buck Hollow.

Continue to monitor permanent Range Trend studies located throughout the unit. Specific information about site locations and results for the La Sal Mountains can be found at: https://wildlife.utah.gov/pdf/range-trends/archive/2019_Southern_Region_Unit_Summary_Report.pdf And for the Dolores Triangle at: https://wildlife.utah.gov/pdf/range-trends/archive/2015_Northeastern_Region_Unit_Summary_Report.pdf

Conduct cooperative seasonal range assessments to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.

Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of conservation easements on private lands.

Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.

Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities.

Work with land management agencies in managing riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid- to late summer.

Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by annual grasses with desirable perennial vegetation. Seek opportunities to increase browse in burned areas of critical winter range.

Reduce expansion of pinion-juniper woodlands into sagebrush habitats and improve habitats dominated by pinion-juniper woodlands by completing habitat restoration projects like lop-and-scatter, bullhog and chaining.

Utilize antlerless deer harvest to improve or protect forage conditions when vegetative declines are attributed to deer over utilization.

Work with private landowners, federal, state, and local governments to maintain and protect critical and existing ranges from future losses and degradation through grazing management and trail, OHV and Travel Plan modifications.

Highway mortality will be monitored and the need for highway fences, passage structures, warning signs and other mitigation options will be evaluated.

RECREATION OBJECTIVES

Provide mule deer hunting that encourages a variety of hunting opportunities while maintaining population objectives.

RECREATION STRATEGIES

Consider early rifle hunt opportunities as hunter crowding and other concerns dictate.

Evaluate areas where extended archery hunts or HAMS hunts could occur.

Work with land managers to maintain access during hunting seasons where appropriate.

Figure 1. Drought Index, La Sal Unit. Top Graph Depicts the Entire Year, Bottom Graph Depicts Spring and Fall.

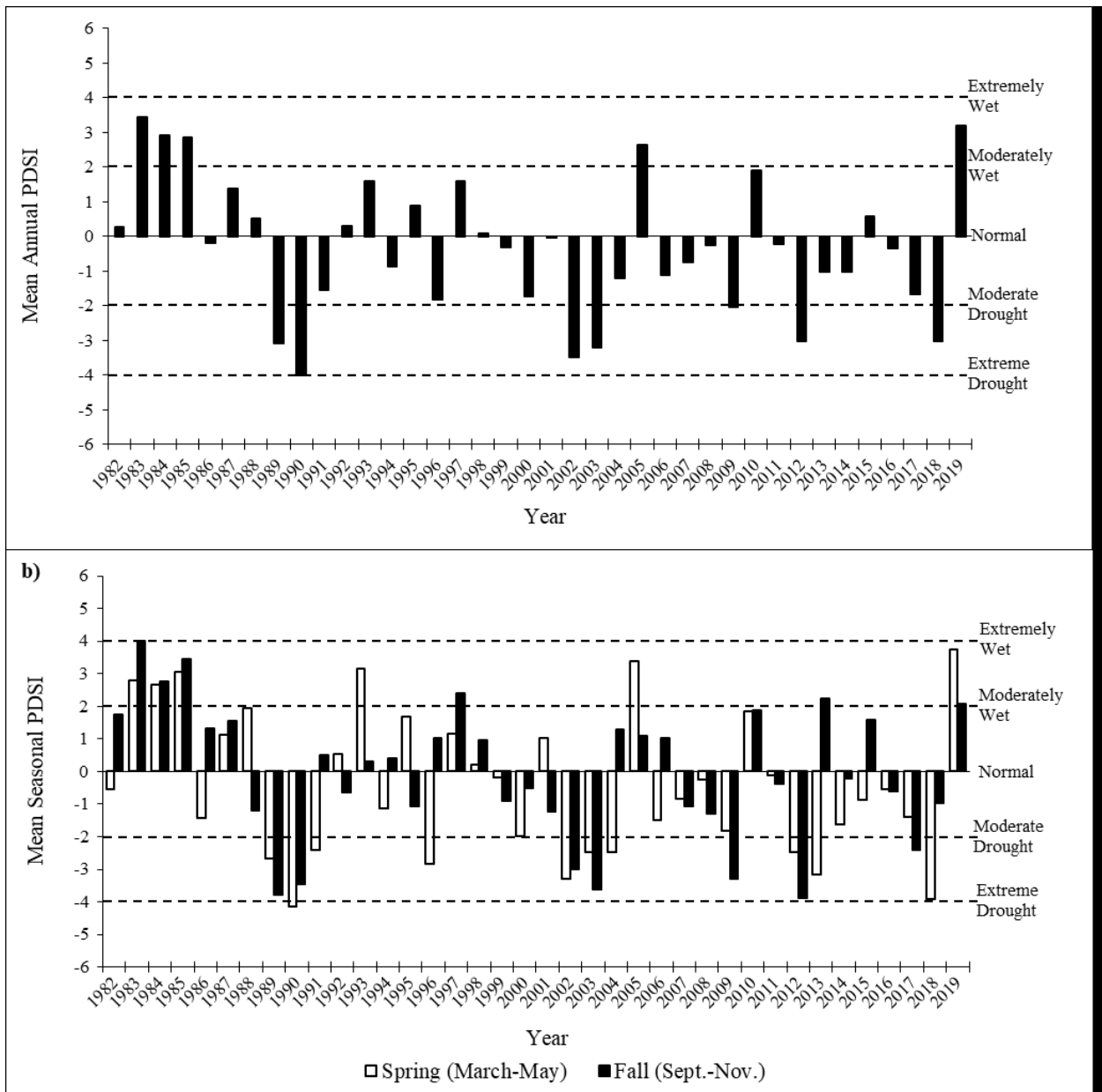


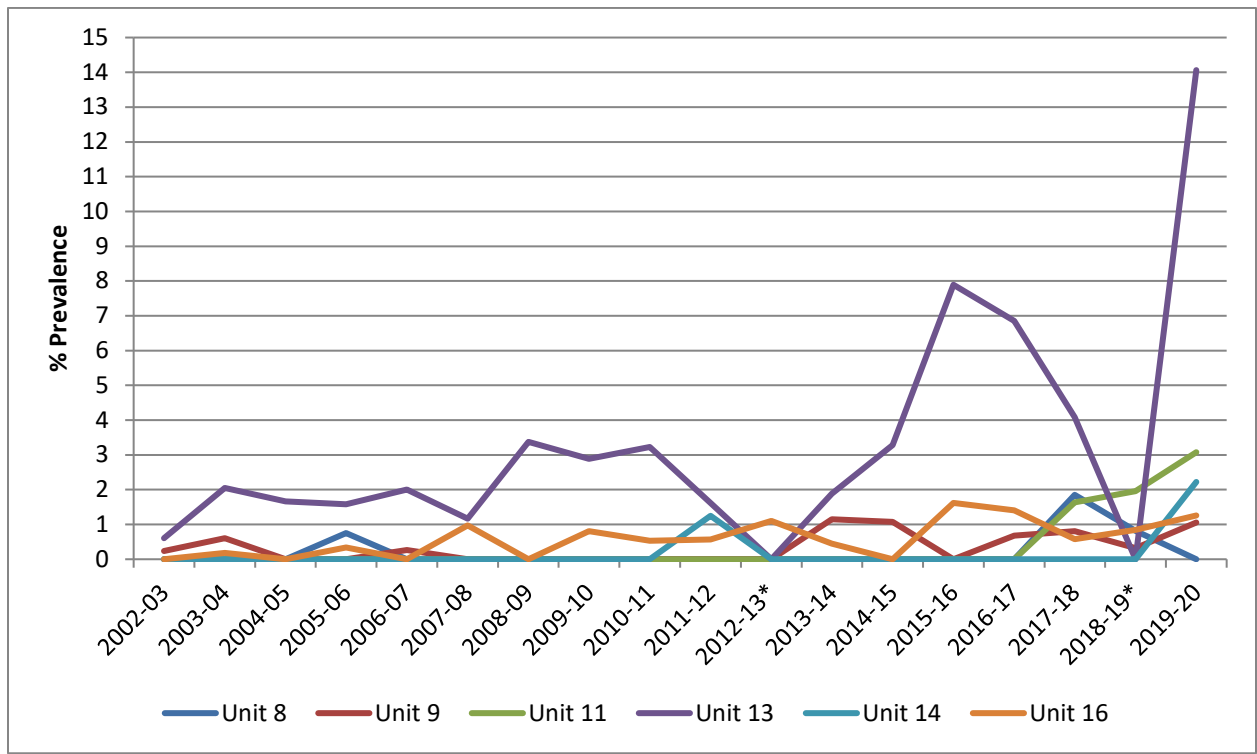
Table 2. Body Fat Comparisons of Captured Deer, 2014-2019.

	Percent (%) Ingesta Free Body Fat (IFBF)					
Unit	Dec	Dec	Dec	Dec	Dec	Dec

	2014	2015	2016	2017	2018	2019
Box Elder						8.79
Cache		11.02	9.59	13.65	10.32	13.71
North Slope					8.59	
South Slope	11.31	9.46	9.00	9.56	7.24	9.90
Oquirrh-Stansbury	10.52	8.43	9.56	8.79	7.39	8.46
Chalk Creek/Kamas					7.19	11.02
Wasatch-Manti		8.76	9.22	10.23	9.32	11.11
Wasatch East						11.51
South Manti			8.87			9.42
Book Cliffs				7.56	6.35	8.80
West Desert					6.33	8.04
Monroe	8.10	8.98	8.23	9.53	6.50	10.37
Beaver						7.75
Boulder						8.54
Panguitch					8.76	8.64
Pine Valley		7.42	6.68	6.54	6.91	6.86
Zion					8.48	9.04
La Sal						8.63
San Juan		9.35	9.25	7.60	7.77	9.50
Statewide	9.98	9.06	8.80	9.18	7.78	9.49



Figure 2. Chronic Wasting Disease (CWD) prevalence on positive units in Utah, 2002-2020.



*Asterisk represents years with very low sample sizes, causing a reduction in prevalence rates.

Figure 3. Chronic Wasting Disease (CWD) Location in Utah, 2002-2020.

CWD Positive Deer & Elk 2002-2020

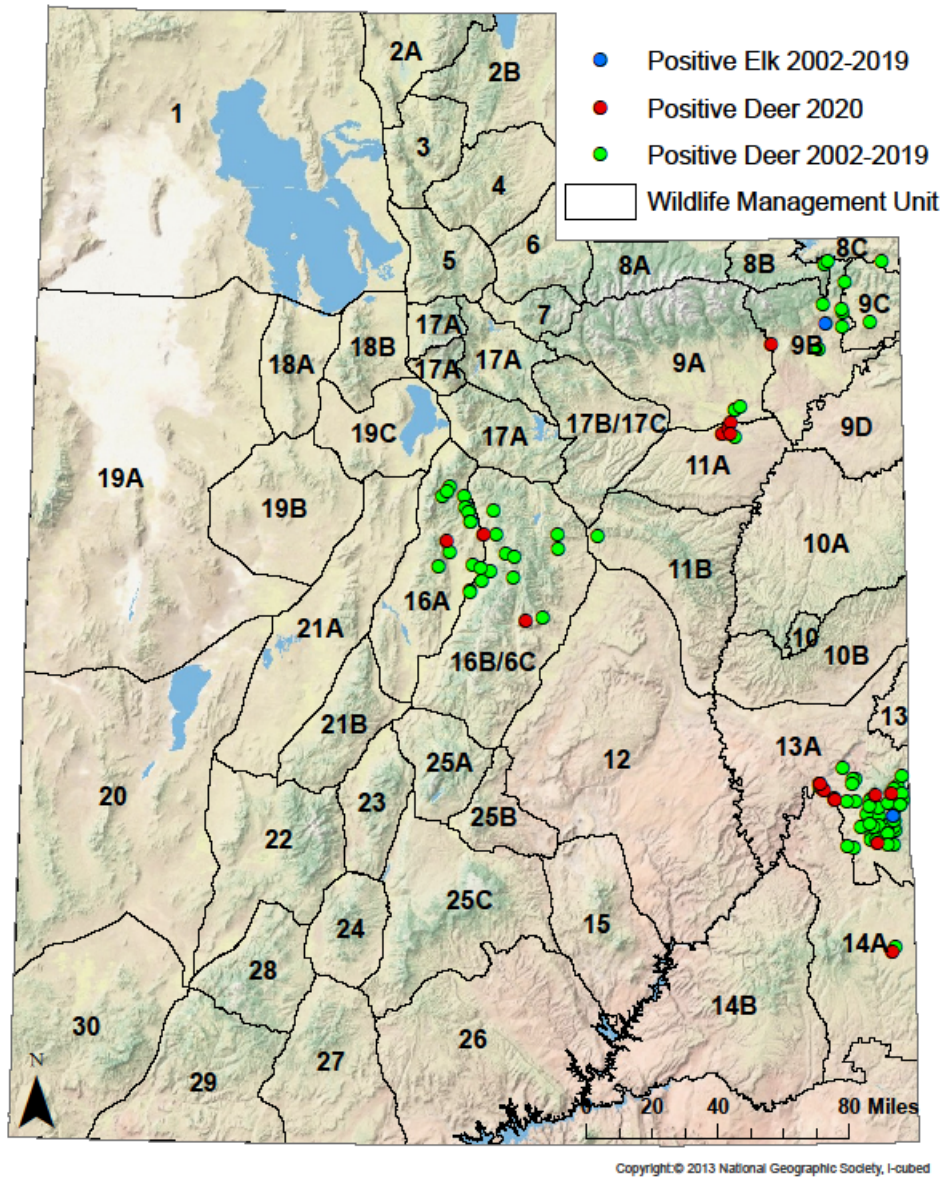


Table 3. Watershed Restoration Initiative Project Acreage Completed 2004-2020.

Treatment Action	Acres
Anchor Chain	614
Bullhog	6,953
Harrow	142
Forestry (Chipping/clearcutting)	181
Greenstripping	54
Herbicide	2,333
Lop-and-Scatter	10,194
Pond Improvement	54
Mowing	5
Planting/Transplanting	179
Prescribed Fire	1,896
Road Decommission	0.27
Seeding	1,253
Stream Corridor	79
Riparian Veg. Improvements	1,432
Total Acres Treated (may overlap)	28,221

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 16BC
Manti
and
Deer Herd Unit #12
San Rafael
September, 2020

BOUNDARY DESCRIPTION

Unit # 16B and 16C Central Mountains, Manti Subunit - Carbon, Emery, Sanpete, Sevier and Utah counties—Boundary begins at the junction of US-6 and US-89 in Spanish Fork Canyon; southeast on US-6 to Price and SR-10; south on SR-10 to I-70; west on I-70 to US-89; north on US-89 to US-6 in Spanish Fork Canyon. USGS 1:100,000 Maps: Nephi, Price, Huntington, Manti, Salina. Boundary questions? Call the Springville office, 801-491-5678 or the Price office, 435-613-3700.

Unit #12 San Rafael Unit - Carbon, Emery, Sanpete, Sevier and Utah counties—Boundary begins US-6 and US-10 in Price; southeast on US-6 to Interstate 70; east on I-70 to the Green River; south along this river to the Colorado River; south along this river (and the west shore of Lake Powell) to SR-95; north on SR-95 to SR-24 (hunters may harvest deer within 2 miles south of SR-24 between SR-95 and the Notom Road); west on SR-24 to Caineville and the Caineville Wash road; north on this road to the Cathedral Valley road; northwest on the Cathedral Valley road to the Capital Reef National Park boundary; north and west on the CRNP boundary back to the Cathedral Valley road; west on this road to Rock Springs Bench and the Last Chance Desert road; north on this road to the Blue Flats road; north and east on this road to the Willow Springs road; north on this road to the Windy Peak road; north and west on this road to I-70; east on I-70 to US-10; north on US-10 to US-6 in Price. Excludes all CWMUs. USGS 1:100,000 Maps: Hanksville, Hite Crossing, Huntington, La Sal, Loa, Manti, Nephi, Price, Salina, San Rafael Desert. Boundary questions? Call the Price office, 435-613-3700.

LAND OWNERSHIP

Unit 16BC Central Mountains, Manti

<i>Ownership</i>	Year Long Range		Summer Range		Winter Range		Spring/Fall Range		Winter/Spring Range	
	<i>Area (acres)</i>	<i>%</i>	<i>Area (acres)</i>	<i>%</i>	<i>Area (acres)</i>	<i>%</i>	<i>Area (acres)</i>	<i>%</i>	<i>Area (acres)</i>	<i>%</i>
BLM	25	2%	4,935	1%	122,496	19%	1,067	1%	2,169	2%
Private	51	5%	86,277	17%	194,785	30%	22,256	10%	33,366	33%
SITLA	1,037	93%	4,796	1%	81,013	12%	28	<1%	703	1%
USFS	0	0%	416,093	81%	211,667	32%	189,142	88%	46,697	46%
UDOT	0	0%	0	0%	92	<1%	0	0%	2	<1%
UDNR	0	0%	2,125	<1%	49,960	7%	2,115	1%	18,107	18%
DOD	0	0%	0	0%	62	<1%	0	0%	16	<1%
Total	1,113	100%	514,225	100%	660,075	100%	214,607	100%	101,060	100%

Unit 12 San Rafael

Unit 12 San Rafael	Yearlong range		Winter Range	
	Area (acres)	%	Area (acres)	%
Bureau of Land Management	127012	69%	3650	54.3%
Utah State Institutional Trust Lands	12913	7%	79	1.2%
Private	22019	12%	3000	44.6%
National Parks	17426	9.5%	0	0%
Utah State Parks	0	0%	0	0%
Utah Division of Wildlife Resources	314	.2%	0	0%
National Recreation Area	4458	2.3%	0	0%
TOTAL	184,141	100%	6,727	100%

UNIT MANAGEMENT GOALS

Expand and improve mule deer populations on the Manti unit considering available habitats and in other land uses. Set realistic and attainable population management objectives that are below biological carrying capacity

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size – Manage for a 5 year target population objective of 28,000 wintering deer on the Manti unit based on the best available model and as range conditions permit. This objective can be raised or lowered in future years if deer populations, range condition, and deer body condition suggest it is sustainable. Current research on survival, body condition, production data, cause specific mortality in combination with range trend data, annual browse monitoring, and past population model estimates will be used to set these objectives.

Data from the past 10 years suggest that during favorable environmental conditions the Manti deer population has reached between 25,000-27,000 deer (Table 1a) and that the previous population objective of 38,000 deer is likely no longer attainable. Range trend data indicate that many critical low elevation sagebrush winter ranges are in poor condition and are likely at or above carrying capacity. This is illustrated in Figures 1 and 2 by the distribution of winter range sites that are in poor or very poor condition. Figure 3 illustrates that browse cover in these important areas is in a downward trend over the past 25 years and has been reduced by approximately 50%. Furthermore, browse density (the number of shrubs/acre) has been reduced by nearly 75%. Browse utilization in these stands has steadily increased during this same time period. All these data suggest that while range conditions on mid and upper elevation winter ranges are adequate, crucial low elevation winter ranges would not be able to sustain the previous population objective.

Body fat data from captured deer on the Manti are relatively good and near statewide averages suggesting that overall, this herd has not reached or exceeded carrying capacity on summer range

and upper elevation winter ranges (Table 2). Range and body condition data combined suggest that the proposed objective is realistic, attainable and allows for herd growth of 4,000 deer over the next 5 years.

Manti Subunit Objective (1998-2019)	38,000 deer
Manti Subunit Objective (2020-2024)	28,000 deer
San Rafael Unit (1998-2019)	no population objective
San Rafael Unit (2020-2024)	no population objective

Population estimates and objectives will not be established for the San Rafael unit. Setting management objectives for San Rafael portion of the unit and obtaining sex-ratios would be unreliable due to small and isolated deer herds resulting in inadequate sample sizes. The majority of deer numbers are concentrated on the unit where there are agricultural corridors. Deer numbers along these corridors are not in decline and provide hunting opportunity to local hunters.

Herd Composition – Manage for a buck to doe ratio of 15 to 17 bucks/100 does. Biologists will take into account current year buck/doe ratio, 3 year average buck/doe ratio and trend as well as fawn and adult survival when making permit recommendations.

Harvest – General Season Unit by Unit buck deer hunt regulations, using archery, any weapon, and muzzleloader hunts. Buck permits will be adjusted to maintain buck/doe objectives. Antlerless permits will be issued to address specific localized crop depredation or range degradation concerns. In addition, antlerless harvest may be used if deer adult and fawn survival, fawn production, and deer body condition suggest the population is approaching carrying capacity.

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size – A population estimate will be made based on fall and spring herd composition counts conducted by biologists, survival and body condition data from GPS collared deer, and hunter harvest data. These data will be used in a computer model to determine a winter deer herd population size. The modeled population estimate for the winter of 2020 was 24,300 deer on the Manti.

Buck/doe ratios and Age Structure – Collect buck/doe and doe/fawn ratio data during fall and spring composition counts. Monitor age structure of bucks harvested at check stations.

Harvest – Collect harvest data from hunter submitted harvest questionnaires.

Research – Continue to collect annual adult doe and fawn survival rates, body condition scores, and cause specific mortality on this unit from GPS collared deer. Continue research efforts to identify migration corridors and limiting factors for deer herd growth.

Table 1a. Population Trends and Harvest for Unit 16BC Central Mountains, Manti

Year	Buck harvest	Permits	Fawn/Doe Ratio	Buck/Doe Ratio	Post-Season Population	Doe Survival	Fawn Survival
2010	1711	9101	73	14	19,900	87	39
2011	1406	7917	64	14	20,900	80	58
2012	2083	7458	72	16	23,600	77	93
2013	2168	8042	65	19	23,500	82	80
2014	2232	7754	67	23	25,100	83	69
2015	2215	8950	64	23	25,100	81	31
2016	2459	9225	64	16	25,700	88	37
2017	2141	8800	63	13	23,300	83	75
2018	2412	8600	65	17	25,700	83	39
2019	1685	8100	56	16	24,300		
average	2051	8395	65	17	23,710	83	58

Table 1b. Harvest Trends for Unit 12 San Rafael

	2015	2016	2017	2018	2019
Hunters Afield	1531	1492	1556	1601	1845
Harvest	421	341	534	381	430

Antlerless Harvest

Use antlerless harvest to locally reduce deer populations when range conditions, deer adult and fawn survival, fawn production, and deer body condition suggest it is approaching carrying capacity.

Use antlerless harvest in combination with the Urban Deer Rule to reduce nuisance and depredation by deer.

Predator Management

Manage predators according to the predator management policy (W1AG-04) where habitat is not limiting and predators are demonstrated to have negative impacts on the population. Indices such as doe and fawn survival, body condition scores, fawn production, and cause specific mortality will be used to determine if predator management is deemed necessary.

Private Lands Management

Support programs that increase tolerance for deer on private lands including CWMU, landowner permits, and Walk-In Access programs.

Address all depredation problems in a timely and efficient manner.

Disease Management

Investigate and manage diseases that threaten mule deer populations. Utilize Statewide CWD Plan objectives and strategies as they apply on this unit. The Manti subunit has been CWD positive for decades and shows an average minimal prevalence of 0.5%

CWD Strategies

- Utilize rotational hunter harvest surveillance, targeting this unit once every several years.
- Consider compulsory testing of hunter harvested deer to increase sample size.
- Consider managing the unit toward the lower end of the buck/doe objective to minimize increase of the disease.
- Consider late season buck hunts in focal hotspots on the unit to minimize disease transmission.
- Educate public and enforce rules regarding carcass importation and disposal from CWD positive areas.

HABITAT MANAGEMENT OBJECTIVES

Maintain or improve mule deer habitat on the unit by protecting, maintaining, and enhancing existing crucial habitats and mitigating losses due to natural and human impacts.

HABITAT MANAGEMENT STRATEGIES

Work with private landowners and federal, state, and local governments to maintain and protect important ranges from future losses and degradation through grazing management and OHV and Travel Plan modifications.

Continue to improve, protect, and restore sagebrush steppe and aspen habitats critical to deer.

Cooperate with federal and state land management agencies and private landowners in carrying out habitat improvements such as conifer removal, pinion-juniper removal, reseeding, controlled burns, grazing management, water developments, pond maintenance, etc. on public and private lands. Habitat improvement projects will occur through the WRI process.

Work with federal and state partners in fire management and rehabilitation on crucial deer habitat.

Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities.

Continue to conduct cooperative seasonal range assessments to evaluate forage condition and utilization. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.

Continue to monitor permanent range trend studies on the unit.

Acquire additional crucial mule deer habitats through fee title or easement as opportunities arise.

Work with UDOT to develop measures that will minimize vehicle deer collisions.

Protect, maintain, and restore stream and riparian habitats to provide diverse foraging opportunities.

RECREATION OBJECTIVES

Provide mule deer hunting that encourages a variety of hunting opportunities while maintaining population objectives.

RECREATION STRATEGIES

Consider early rifle hunt opportunities as hunter crowding and other concerns dictate.

Evaluate areas where extended archery hunts or HAMS hunts could occur.

Work with land managers to maintain access during hunting seasons where appropriate.

RANGE TREND SUMMARIES AND BODY CONDITION DATA

Figure 1. Manti Deer Winter Range Desirable Components Index (DCI) Showing Proportions of Range Sites in each Condition Class (Poor, Fair, Good, etc.)

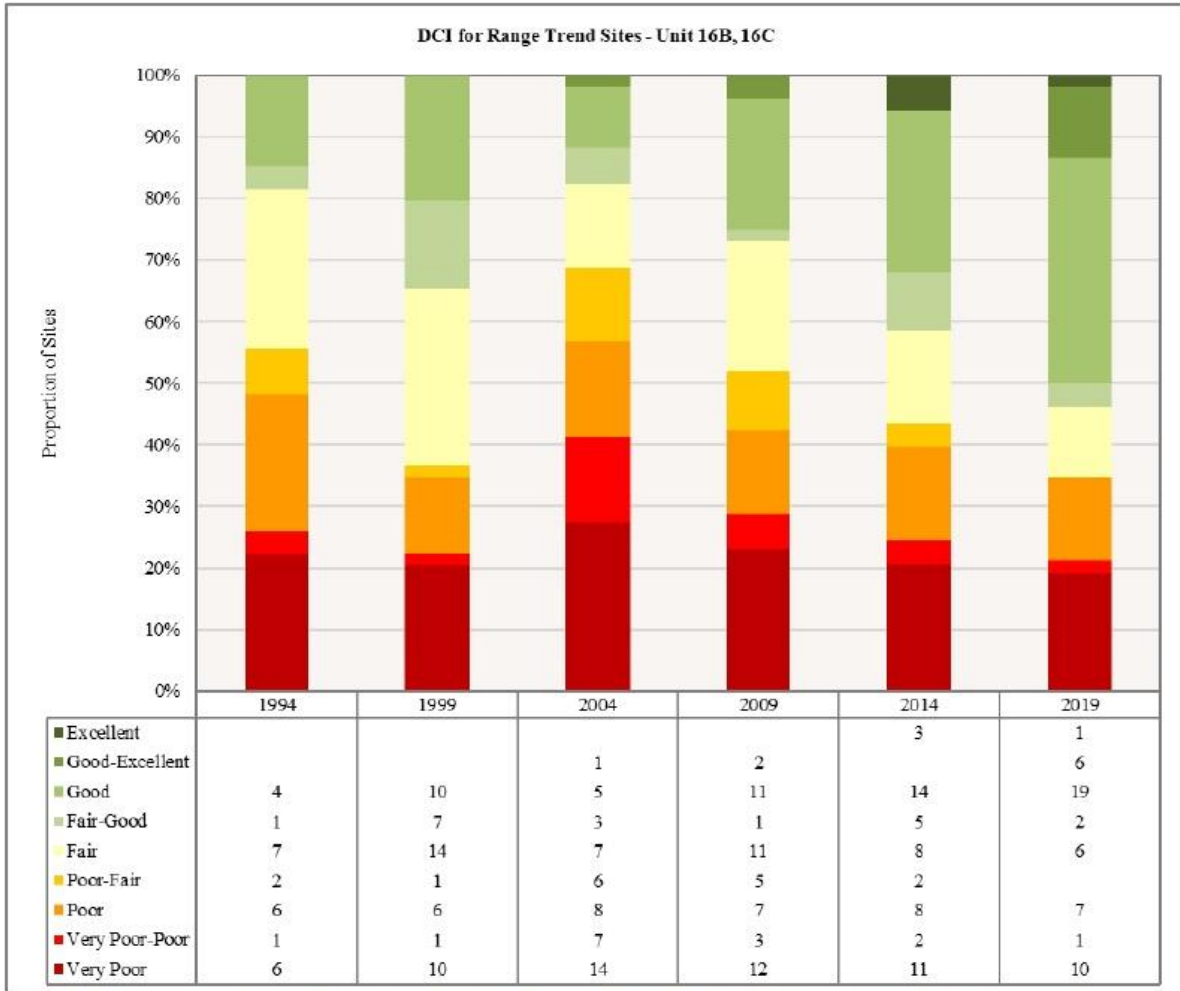
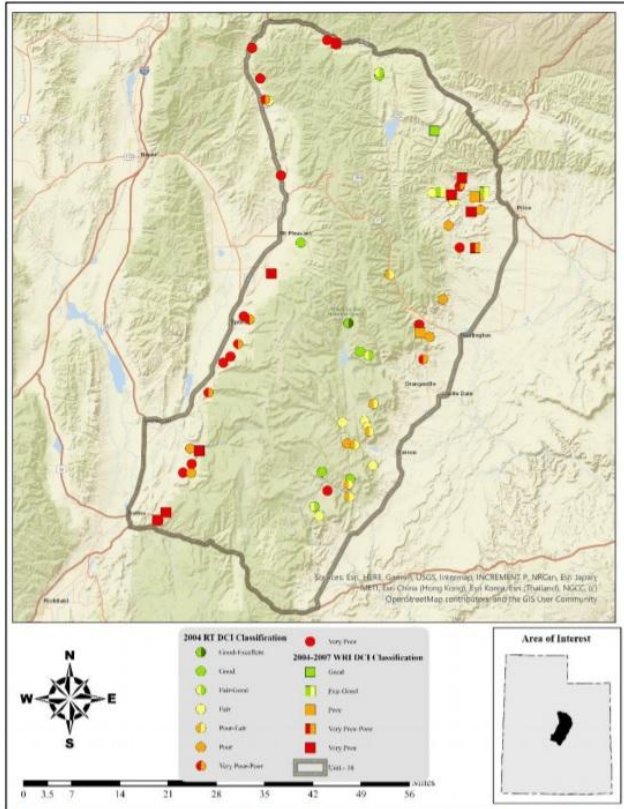
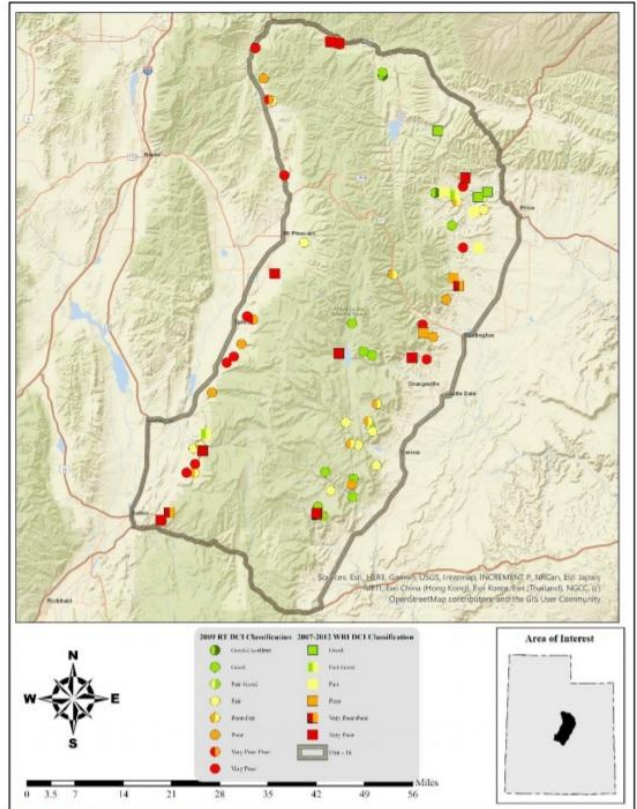


Figure 4.47: Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 16B, 16C, Manti Central Mountains.

Figure 2. Map of Range Trend Sites in 2014 and 2019 Showing DCI Condition for Each Site



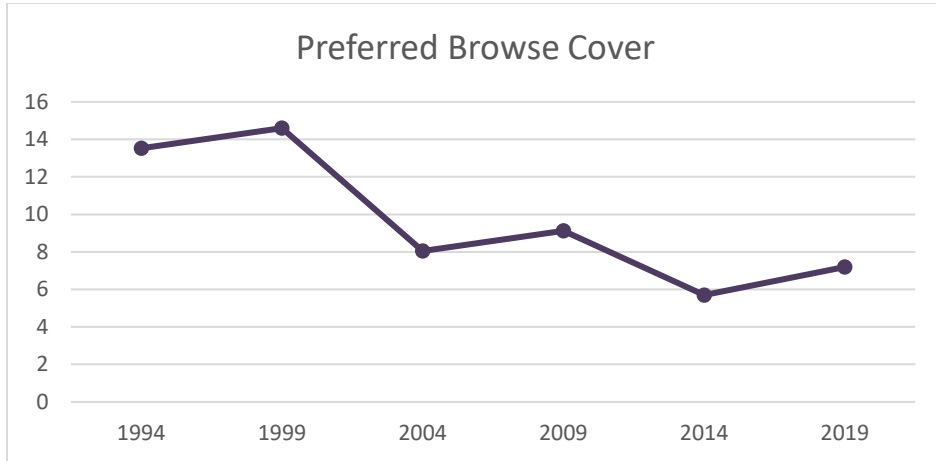
Map 4.11: 2004 Desirable Components Index (DCI) ranking distribution by study site for WMU 16B, 16C, Manti Central Mountains.



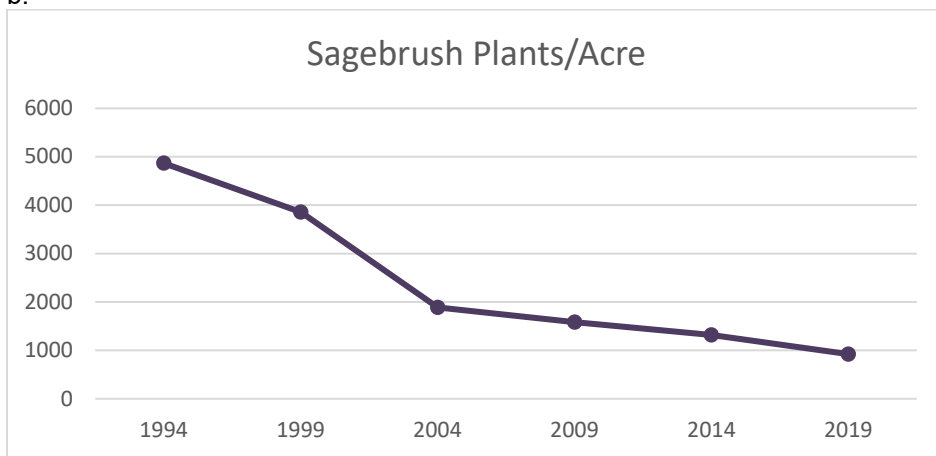
Map 4.12: 2009 Desirable Components Index (DCI) ranking distribution by study site for WMU 16B, 16C, Manti Central Mountains.

Figure 3a-c. Trends in Browse Cover (a), Density (b), and Utilization (c) on 8 Crucial Low Elevation Big Sagebrush Range Trend Sites on the Central Mountains, Manti Unit, 1994-2019.

a.



b.



c.

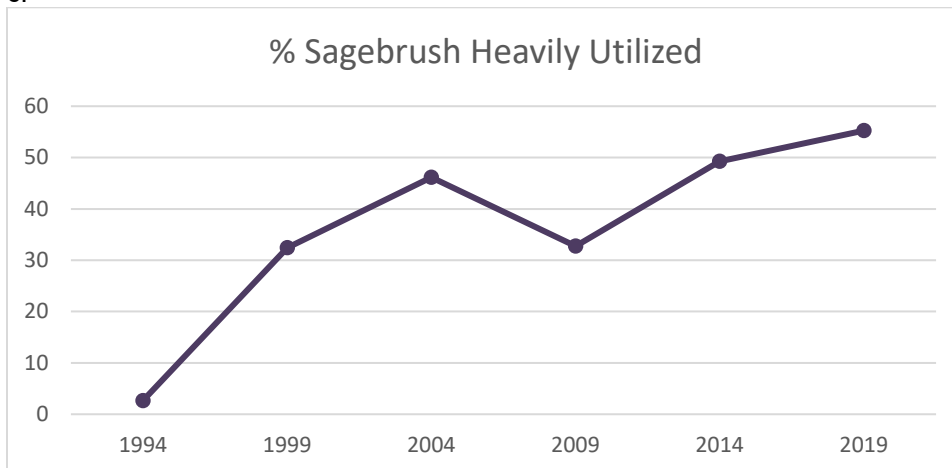
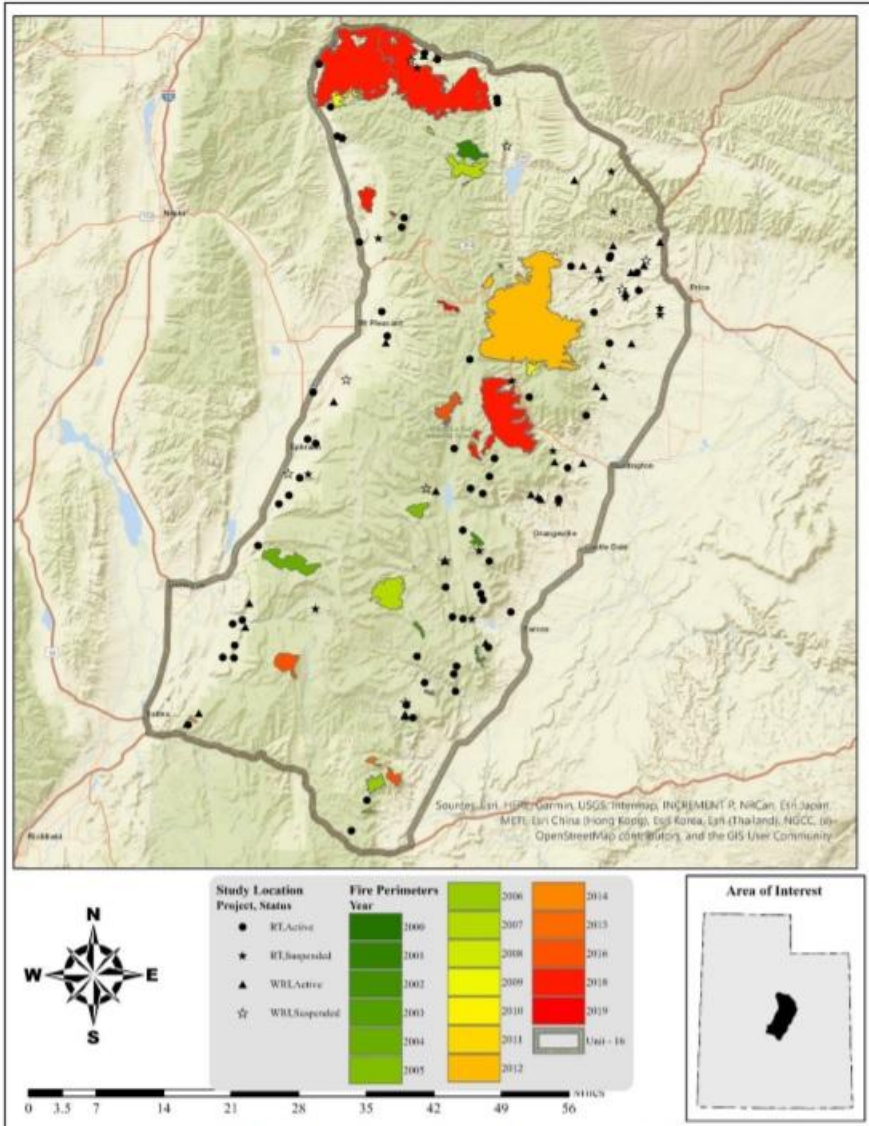


Table 2. Body Fat Comparisons of Captured Deer, 2014-2019 (Manti deer highlighted in red)

Unit	Percent (%) Ingesta Free Body Fat (IFBF)					
	Dec 2014	Dec 2015	Dec 2016	Dec 2017	Dec 2018	Dec 2019
Box Elder						8.79
Cache		11.02	9.59	13.65	10.32	13.71
North Slope					8.59	
South Slope	11.31	9.46	9.00	9.56	7.24	9.90
Oquirrh-Stansbury	10.52	8.43	9.56	8.79	7.39	8.46
Chalk Creek/Kamas					7.19	11.02
<i>Wasatch-Manti</i>		8.76	9.22	10.23	9.32	11.11
Wasatch East						11.51
<i>South Manti</i>			8.87			9.42
Book Cliffs				7.56	6.35	8.80
West Desert					6.33	8.04
Monroe	8.10	8.98	8.23	9.53	6.50	10.37
Beaver						7.75
Boulder						8.54
Panguitch					8.76	8.64
Pine Valley		7.42	6.68	6.54	6.91	6.86
Zion					8.48	9.04
LaSal						8.63
San Juan		9.35	9.25	7.60	7.77	9.50
Statewide	9.98	9.06	8.80	9.18	7.78	9.45

Figure 4. Wildfires Occurring on Mule Deer Habitat, Central Mountains, Manti unit 2006-18



Map 4.7: Land coverage of fires by year from 2000-2019 for WMU 16B/C, Manti North/South (Geosciences and Environmental Change Science Center (GECSC) Outcrops Database, 2020).

Figure 5. Mule Deer habitat treatment projects, Central Mountains, Manti 2006-18.

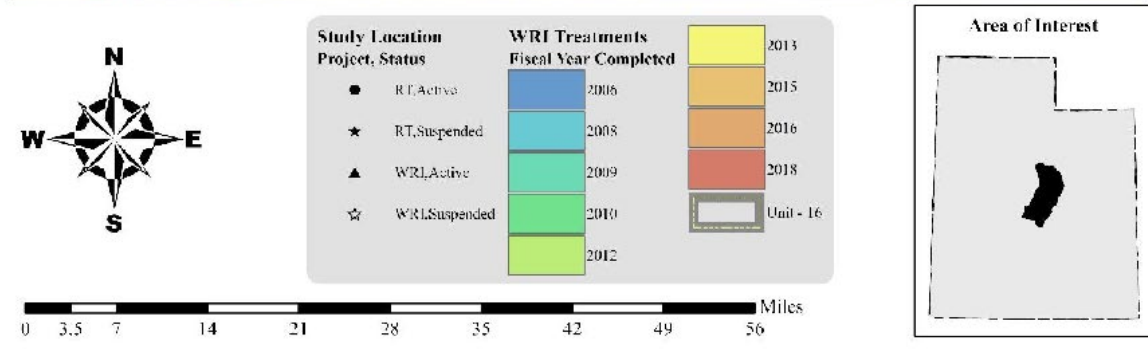
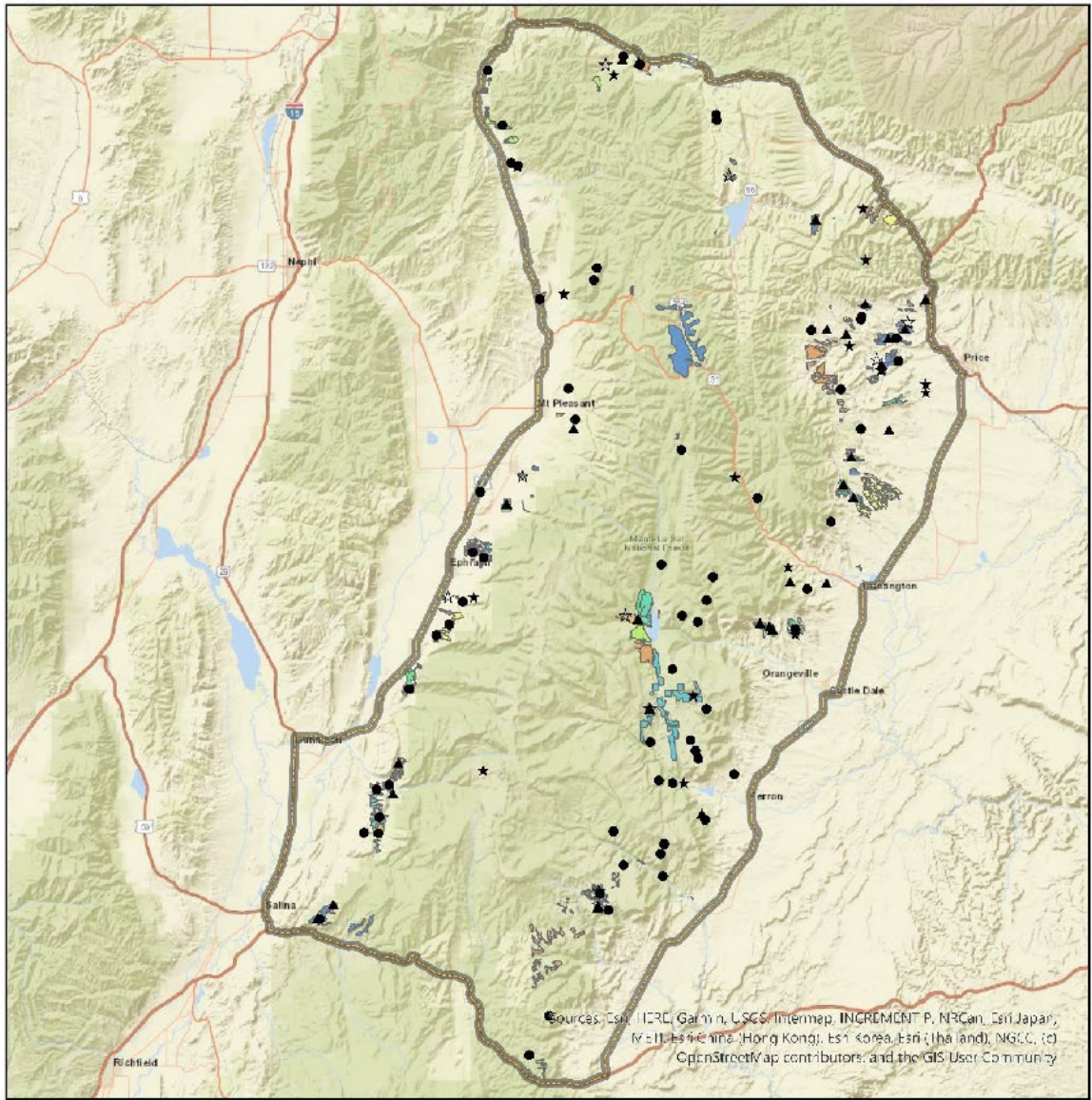


Table 3. Mule Deer Habitat Projects Completed, Underway, and Proposed 2006-18

Treatment Type	Completed Treatment Acreage	Current Projects	Proposed Treatments	Total Treated Acres
Mechanical Treatment	35,510	3,104	4,903	43,517
Forestry Practices	0	352	88	440
Herbicide Application	8,222	423	871	9,516
Prescribed Fire	1,848	0	16,367	18,215
Seeding/Planting	30,678	2,769	12,649	46,096
Hand Crew (Lop and Scatter)	15,283	2,206	7,924	25,413
Other	18	0	0	18
Grand Total	91,559	8,854	42,802	143,215

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit # 14
San Juan
September 2020

BOUNDARY DESCRIPTIONS

Grand and San Juan Counties - Boundary begins at the confluence of the San Juan and Colorado rivers; north along the Colorado river to Kane Springs Creek; southeast along this creek to Hatch Wash; southeast along this wash to US-191; south on this road to the Big Indian road; east on this road to the Lisbon Valley road; southeast on this road to the Island Mesa road; east on this road to the Colorado state line; south on this line to the Navajo Indian Reservation boundary; southwest along this boundary to the San Juan River; west on this river to the Colorado River.

This boundary includes two subunits including:

Unit 14A - San Juan, Abajo Mountains - Grand and San Juan Counties - Boundary begins at the junction of Highway US-163 and South Cottonwood Creek (near Bluff); then north along this creek to Allen Canyon; north along this canyon to Chippean Canyon; north along this canyon to Deep Canyon; north along this canyon to Mule Canyon; north along this canyon to the Causeway; north from the Causeway to Trough Canyon; north along this canyon to North Cottonwood Creek; north along this creek to Indian Creek; north along this creek to the Colorado River; north along this river to Kane Springs Creek; southeast along this creek to Hatch Wash; southeast along this wash to Highway US-191; south on this road to the Big Indian road; east on this road to the Lisbon Valley road; southeast on this road to the Island Mesa road; east on this road to the Colorado state line; south on this line to the Navajo Indian Reservation boundary; west and south along this boundary to the San Juan River; west on this river to Highway US-163; then east on this highway to South Cottonwood Creek.

Unit 14B - San Juan, Elk Ridge - San Juan County - Boundary begins at the junction of highway US-163 and South Cottonwood Creek (near Bluff); north along this creek to Allen Canyon; north along this canyon to Chippean Canyon; north along this canyon to Deep Canyon; north along this canyon to Mule Canyon; north along this canyon to the Causeway; north from the Causeway to Trough Canyon; north along this canyon to North Cottonwood Creek; north along this creek to Indian Creek; north along this creek to the Colorado River; south on this river to the San Juan River; east on this river to highway US-163; east on this highway to South Cottonwood Creek.

LAND OWNERSHIP

Subunit 14A - San Juan, Abajo Mountains

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service			130454	38%	1670	<1%
Bureau of Land Management			75780	22%	420722	61%
Utah State Institutional Trust Lands			9219	3%	59981	9%
Native American Trust Lands			0	0%	12	<1%

Private			125767	37%	210695	30%
National Parks			0	0%	390	<1%
Utah State Parks			0	0%	0	0%
Division of Wildlife Resources			0	0%	0	0%
TOTAL			341220	100%	693470	100%

Subunit 14B - San Juan, Elk Ridge

RANGE AREA AND APPROXIMATE OWNERSHIP

Ownership	Yearlong range		Summer Range		Winter Range	
	Area (acres)	%	Area (acres)	%	Area (acres)	%
Forest Service	225	<1%	168372	65%	19210	3%
Bureau of Land Management	64649	94%	50048	19%	505156	76%
Utah State Institutional Trust Lands	4055	6%	4688	2%	50213	8%
Native American Trust Lands	0	0%	0	0%	7	<1%
Private	0	0%	3076	1%	6042	<1%
National Parks	15	<1%	69	<1%	54196	8%
National Recreation Area	0	0	0	0	10983	2%
USFS & BLM Wilderness Area	106	<1%	32973	13%	12679	2%
Utah Division of Wildlife Resources	0	0%	0	0%	0	0%
TOTAL	69050	100%	259226	100%	658486	100%

UNIT MANAGEMENT GOALS

Manage for realistic and attainable population management objectives that are below biological carrying capacity to maintain healthy and productive deer populations.

Manage the deer population at a level capable of providing a broad range of recreational opportunities, including hunting and viewing.

Balance deer herd goals and objectives with impacts on human needs, such as private property rights, agricultural crops and local economies.

POPULATION MANAGEMENT OBJECTIVES

Target Winter Herd Size - Achieve a target population of 14,500 wintering deer (modeled number) during the five-year planning period.

Subunit	2015-2019 Objective	2020-2024 Objective
Abajo Mountains	13,500	13,500
Elk Ridge	5,600	1,000
UNIT TOTAL	20,500	14,500

The 2020-2024 population objectives are not necessarily the carrying capacity nor the long-term objectives. Deer populations will be assessed annually using the monitoring strategies outlined below to determine the current population status and their relationship to carrying capacity. Deer populations can be very dynamic depending on a number of factors that can change carrying capacity. Deer objectives can be adjusted based on range condition and trend assessments, as well as deer body condition, productivity and survival trends. Improvements in computer population modeling has provided better estimates of current deer numbers which will aid in setting population objectives that are more realistic and attainable.

Abajo Mountains – No change needed in population objective. This population has been within 85% of the population objective 4 out of the past 5 years (Table 1). Desirable Components Index (DCI) scores from the 2019 range trend survey shows that the unit has generally remained the same over time (Figure 1). Body fat measurements from captured deer on the unit in 2019 were the highest recorded in the past 5 years and near statewide averages (Table 2). These data suggest that overall, this herd has not reached or exceeded carrying capacity on summer range and upper elevation winter ranges on years with favorable environmental conditions. Population trend, habitat and body condition data, combined with highway mortality data suggest that the current objective is realistic, attainable and allows for herd growth of 4,100 deer over the next 5 years.

Elk Ridge – A reduction in population objective to 1,000 deer will be implemented in 2020 due to poor conditions on critical winter ranges and an extremely low current deer population. This subunit has experienced a large population decline over the past 20-25 years and was estimated in 2019 at 600 deer (Table 1). Elk Ridge is a narrow plateau of summer range with limited perennial water sources. Fawn production has remained at low levels for an extended period of time primarily due to prolonged drought periods and poor summer range conditions (Table 1 and Figure 2). Beef Basin, which represents approximately 20% of crucial deer winter range on the subunit, has experienced severe reductions in sagebrush abundance since 1994, promoting an increase in annual grasses, mostly cheat grass. Recently, Black Mesa has experienced severe sagebrush foliage reduction due to the extreme drought in 2018 (Figure 3). The 2019 DCI overall rating for sites in this area are "poor". Projecting the population 5 years into the future using current computer modeling and averaging survival, harvest and classification data from the past 10 years yields a population estimate of 800 deer. Considering the high body condition score of deer this past winter and acknowledging that biological measurements may increase above the average values used in the model, it is suggested that an obtainable population objective for Elk Ridge would be 1,000 deer, which allows for herd growth of 400 deer over the next 5 years.

Herd Composition

Abajo Mountains – Manage for a buck to doe ratio of 18-20 bucks per 100 does in accordance with the statewide plan. This is a change from the previous objective of 15-17 bucks per 100 does. This subunit consistently shows higher fawn production than surrounding units and has a history of maintaining a buck to doe ratio within the new objective. A public survey indicated strong support for

maintaining a higher buck to doe ratio on this subunit. Biologists will take into account current year buck/doe ratio, 3 year average buck/doe ratio and trend as well as fawn and adult survival when making permit recommendations.

Elk Ridge – Manage for a buck to doe ratio of 25-35 bucks per 100 does, in accordance with the statewide plan. Biologists will take into account current year buck/doe ratio, 3 year average buck/doe ratio and trend as well as fawn and adult survival when making permit recommendations.

Harvest

Abajo Mountains - Continue General Season Unit by Unit buck deer hunt regulations, using archery, any weapon, and muzzleloader hunts. Antlerless removal may be implemented if needed to maintain the population below carrying capacity and to address specific localized crop depredation, range degradation or urban conflict concerns, using a variety of harvest methods and seasons.

Elk Ridge - Continue Limited Entry buck deer hunting strategy to maintain herd composition objectives and quality hunting opportunities. Antlerless removal may be implemented if needed to address specific localized range degradation issues. Antlerless removal will likely not occur for population management during the duration of this plan given that the population is considerably below carrying capacity.

POPULATION MANAGEMENT STRATEGIES

Monitoring

Population Size - The **Abajo Mountains** and **Elk Ridge** population estimates will be made based on fall and spring herd composition counts conducted by biologists, survival and body condition data from GPS collared deer, and hunter harvest data. These data will be used in computer models to determine a winter deer herd population size. The modeled population estimate for the winter of 2020 was 9,400 deer on the Abajo Mountains subunit and 600 deer on the Elk Ridge subunit.

Buck/doe ratios and Age Structure - Monitor age class structure of the buck population through the use of check stations, postseason classification, uniform harvest surveys and field bag checks.

Harvest - The primary means of monitoring harvest will be through the statewide uniform harvest survey and the use of check stations.

Research - Continue to collect annual adult and fawn survival rates, body condition scores, and cause specific mortality on this unit from GPS collared deer. Continue research efforts to identify migration corridors and limiting factors for deer herd growth.

Table 1. Population and Harvest Trend data for the Abajos (top) and Elk Ridge (bottom).

Population Trends and Harvest for the San Juan, Abajo Mountains (14a) Deer Subunit

Year	Buck harvest	Permits	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2015	905	2500	57	24	11,900	13,500	88%

2016	1048	2650	55	23	12,700	13,500	94%
2017	1018	2750	51	22	12,900	13,500	96%
2018	876	2750	32	18	11,700	13,500	87%
2019	713	2750	44	14	9,400	13,500	70%
5 Year Avg	912	2,680	48	20	11,720		

Population Trends and Harvest for the San Juan, Elk Ridge (14b) Deer Subunit

Year	Buck harvest	Permits	Post-Season F/100 doe	Post-Season B/100 doe	Post-Season Population	Objective	% of Objective
2015	47	57	43	43	800	5,600	14%
2016	43	56	48	43	900	5,600	16%
2017	49	56	28	30	800	5,600	14%
2018	42	52	27	44	750	5,600	13%
2019	48	59	35	24	600	5,600	11%
5 Year Avg	46	56	36	37	770		

Antlerless Harvest

Use antlerless harvest to locally reduce deer populations when range conditions, deer adult and fawn survival, fawn production, and deer body condition suggest it is necessary.

Use antlerless harvest in combination with the Urban Deer Rule to reduce nuisance and depredation by deer.

Predator Management

Manage predators according to the predator management policy (W1AG-04) where habitat is not limiting and predators are demonstrated to have negative impacts on the population. Indices such as doe and fawn survival, population growth rate, body condition scores, fawn production, and cause specific mortality will be used to determine if predator management is deemed necessary.

Private Lands Management

Support programs that increase tolerance for deer on private lands including CWMU, landowner permits, and Walk-In Access programs.

Address all depredation problems in a timely and efficient manner.

Disease Management

Investigate and manage diseases that threaten mule deer populations and continue monitoring for chronic wasting disease (CWD) as stated in the Statewide plan. This unit is a CWD positive unit (<0.05% prevalence).

CWD Strategies

- Utilize rotational hunter harvest surveillance, targeting this unit once every several years.
- Consider compulsory testing of hunter harvested deer to increase sample size.
- Consider managing the unit toward the lower end of the buck/doe objective to minimize increase of the disease.
- Consider late season buck hunts in focal hotspots on the unit to minimize disease transmission.

- Educate public and enforce rules regarding carcass importation and disposal from CWD positive areas.

Urban Deer Management

Continue working with municipalities on localized urban deer control management actions. Work cooperatively with municipalities in developing urban deer management plans, within the guidelines set by state law and agency policies.

HABITAT MANAGEMENT OBJECTIVES

Maintain or improve mule deer habitat on the unit by protecting, maintaining, and enhancing existing crucial habitats and mitigating losses due to natural and human impacts.

Minimize deer vehicle collisions along highways on the unit by continuing to cooperate with UDOT in construction and maintenance of highway fences, passage structures and warning signs, etc. Data from previous projects are in Figure 4.

HABITAT MANAGEMENT STRATEGIES

Continue to improve, protect, and restore summer and winter ranges critical to deer, such as aspen and sagebrush steppe communities. Cooperate with federal land management agencies and private landowners in carrying out habitat improvements such as pinion-juniper removal, reseeding, controlled burns, mechanical treatments, grazing management, water developments etc. on public and private lands. Habitat improvement projects will occur through the WRI process. Projects completed to date are summarized in Table 3.

Continue to work with and support Universities and land management agencies on habitat research projects. Continue to stay apprised on Utah State University's current sagebrush restoration project and the USFS aspen regeneration project on Elk Ridge.

Continue to monitor permanent Range Trend studies located throughout the unit. Specific information about site locations and results can be found at: https://wildlife.utah.gov/pdf/range-trends/archive/2019_Southern_Region_Unit_Summary_Report.pdf

Conduct cooperative range assessments to evaluate forage condition and utilization of important deer ranges. Determining opportunities for habitat improvements will be an integral part of these surveys. This will also be pivotal in determining if antlerless harvest is necessary.

Work toward long term habitat protection and preservation through the use of agreements with federal agencies and local governments and the use of conservation easements on private lands.

Support, cooperate with, and provide input to land management planning efforts dealing with actions affecting habitat security, quality and quantity.

Work with land management agencies and energy companies to minimize and mitigate impacts of energy development activities.

Work with land management agencies in managing riparian areas in critical fawning habitat to furnish water, cover and succulent forage from mid- to late summer.

Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips and reseed areas dominated by annual grasses with desirable perennial vegetation. Seek opportunities to increase browse in burned areas of critical winter range.

Reduce expansion of pinion-juniper woodlands into sagebrush habitats and improve habitats dominated by pinion-juniper woodlands by completing habitat restoration projects like lop-and-scatter, bullhog and chaining.

Utilize antlerless deer harvest to improve or protect forage conditions when vegetative declines are attributed to deer over utilization.

Work with private landowners, federal, state, and local governments to maintain and protect critical ranges from future losses and degradation through grazing management and trail, OHV and Travel Plan modifications.

Highway mortality will continue to be monitored and the need for additional highway fences, passage structures, warning signs and other mitigation options will be evaluated.

RECREATION OBJECTIVES

Provide mule deer hunting that encourages a variety of hunting opportunities while maintaining population objectives.

RECREATION STRATEGIES

Consider early rifle hunt opportunities as hunter crowding and other concerns dictate.

Work with land managers to maintain access during hunting seasons where appropriate.

RANGE TREND SUMMARIES AND BODY CONDITION DATA

Figure 1. Deer winter range Desirable Components Index (DCI) summary by year of Range Trend sites for WMU 14, San Juan.

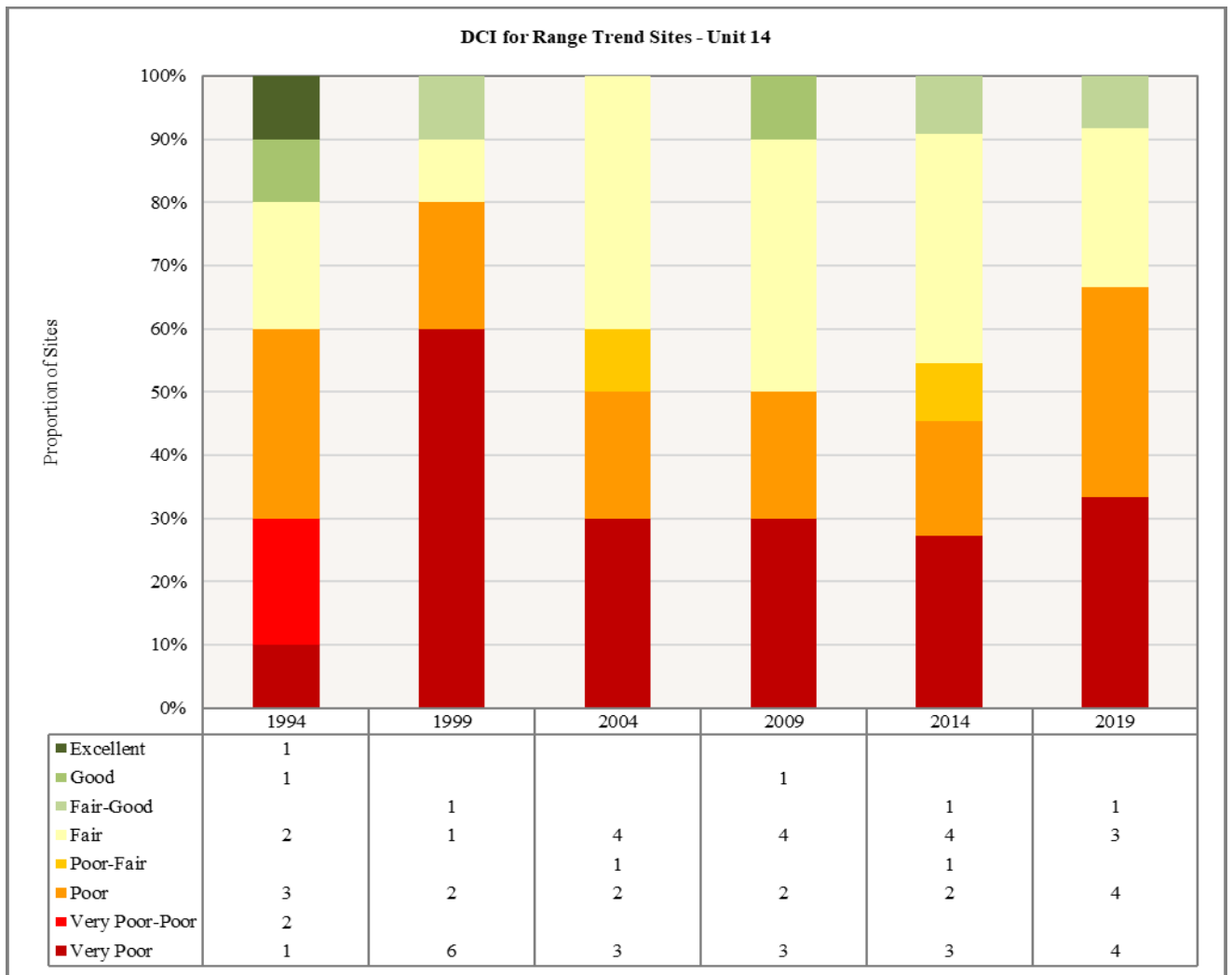


Table 2. Body Fat Comparisons of Captured Deer, 2014-2019.

Unit	Percent (%) Ingesta Free Body Fat (IFBF)					
	Dec 2014	Dec 2015	Dec 2016	Dec 2017	Dec 2018	Dec 2019
Box Elder						8.79

Cache		11.02	9.59	13.65	10.32	13.71
North Slope					8.59	
South Slope	11.31	9.46	9.00	9.56	7.24	9.90
Oquirrh-Stansbury	10.52	8.43	9.56	8.79	7.39	8.46
Chalk Creek/Kamas					7.19	11.02
Wasatch-Manti		8.76	9.22	10.23	9.32	11.11
Wasatch East						11.51
South Manti			8.87			9.42
Book Cliffs				7.56	6.35	8.80
West Desert					6.33	8.04
Monroe	8.10	8.98	8.23	9.53	6.50	10.37
Beaver						7.75
Boulder						8.54
Panguitch					8.76	8.64
Pine Valley		7.42	6.68	6.54	6.91	6.86
Zion					8.48	9.04
La Sal						8.63
San Juan		9.35	9.25	7.60	7.77	9.50
Statewide	9.98	9.06	8.80	9.18	7.78	9.49



Figure 2. Drought Index, San Juan Unit. Top Graph Depicts the Entire Year, Bottom Graph Depicts Spring and Fall.

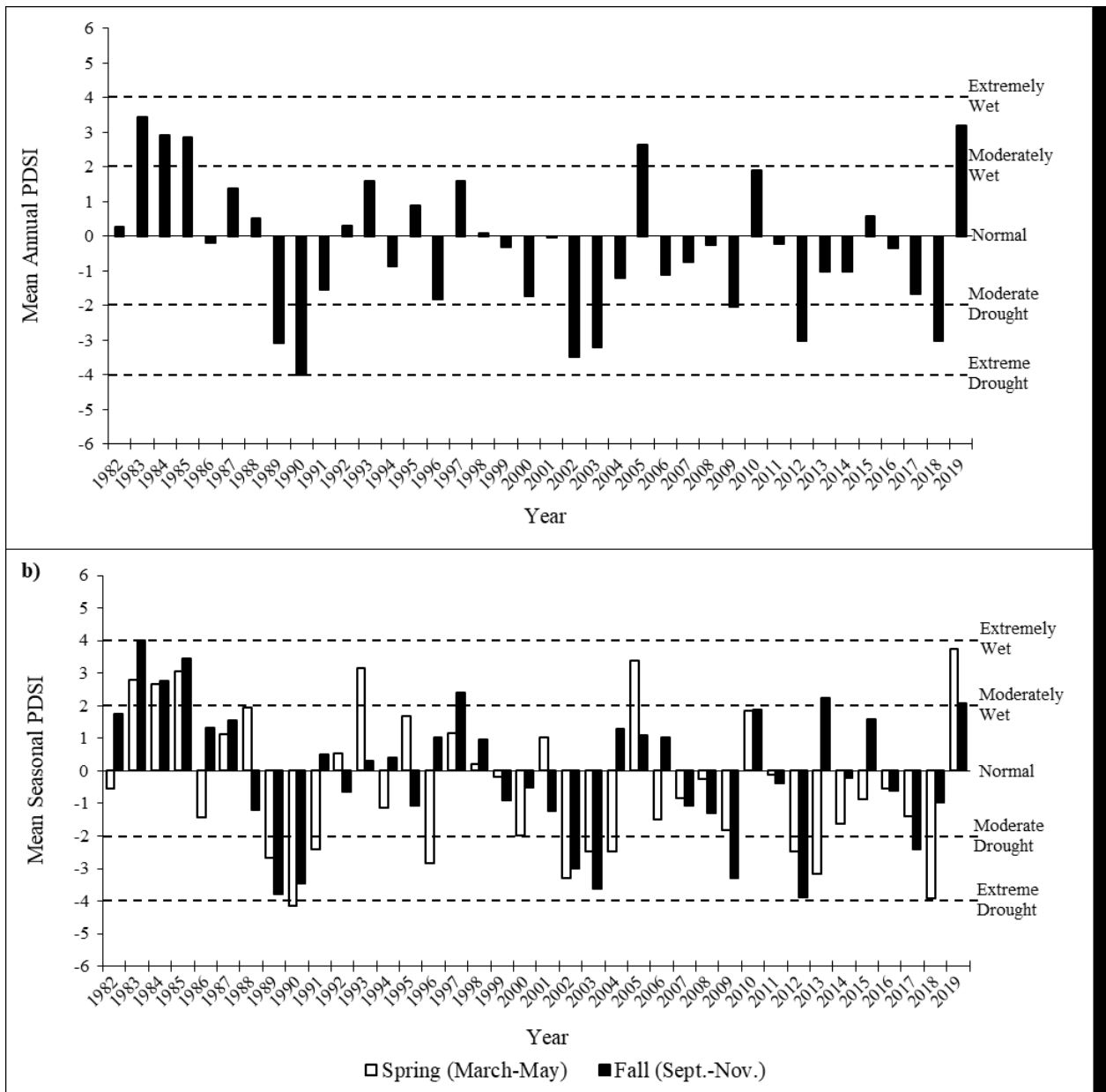


Figure 3a-b. Trends in Browse Cover (a) and Density (b), on Black Mesa Crucial Low Elevation Big Sagebrush Range Trend Site on the San Juan Unit, 1992-2019.

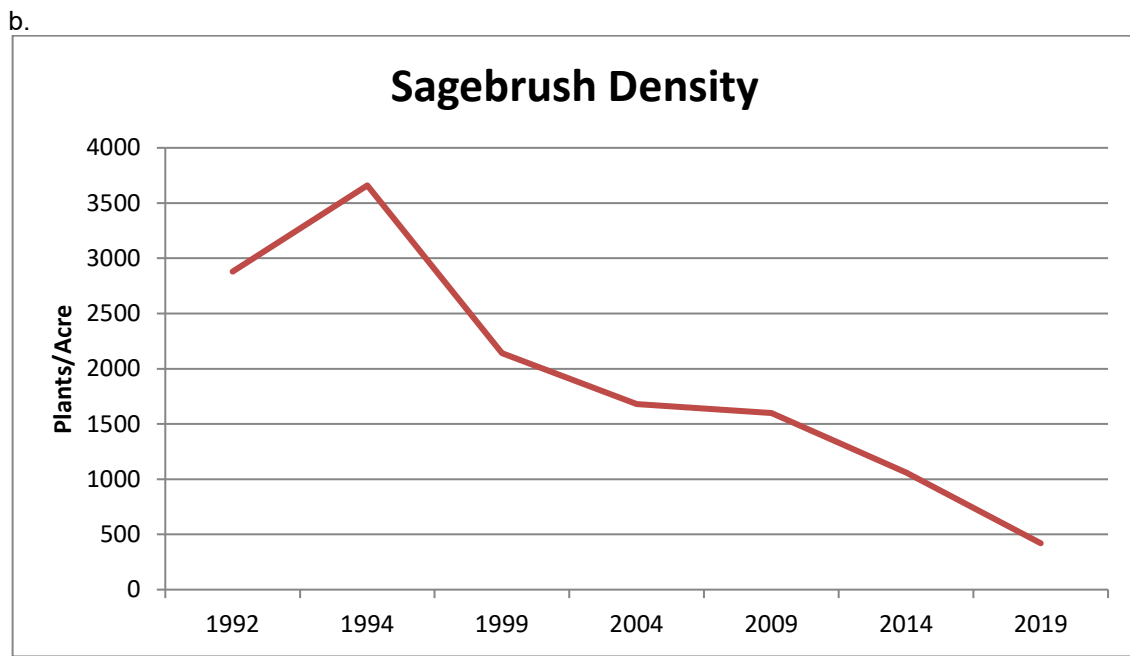
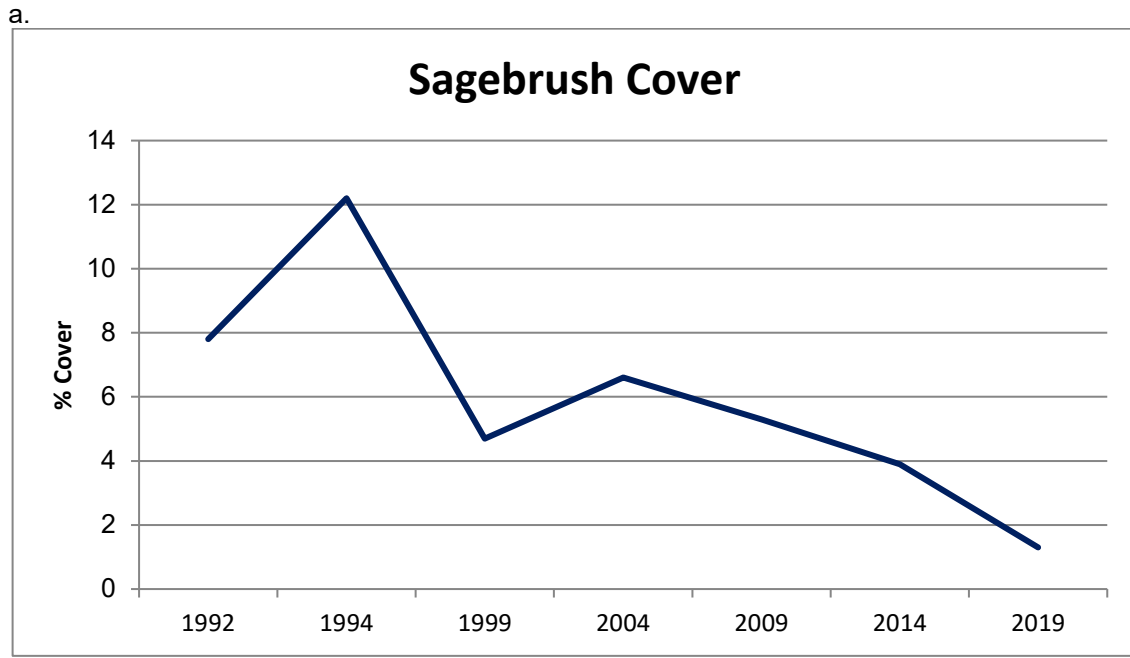
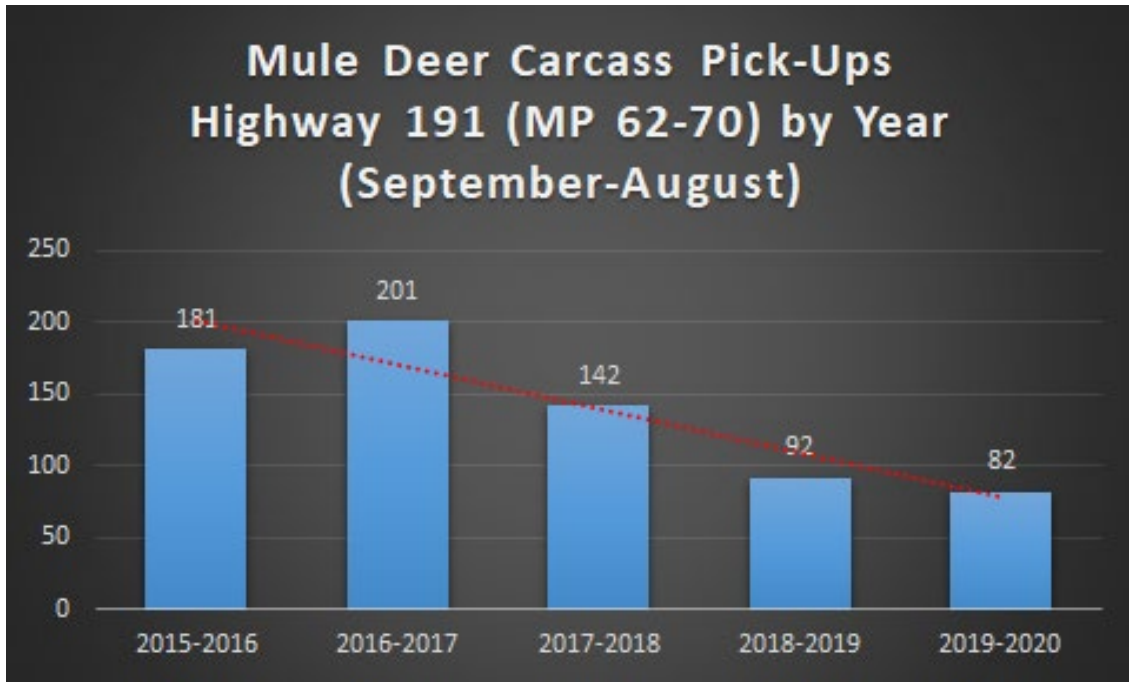


Figure 4. Carcass Pick-Up Data within Project Area of Highway 191, San Juan, Abajos Unit.



Highway mortality on this unit was historically very high, with approximately 400 deer a year being killed by vehicle collisions. There has been a considerable amount of effort put into fencing and crossing structures along Highway 191. To date, there has been a total of approximately 7 miles of highway fenced and 6 wildlife crossings installed. Carcass collection numbers have reduced 50% within the project area in the past two years.

Table 3. Watershed Restoration Initiative Project Acreage Completed 2004-2020.

Treatment Action	Acres
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Aerator	3,248
Bullhog	11,277
Disc	2,083
Easement	1,082
Forestry Practices (non-commercial thinning)	270
Harrow	2,205
Herbicide Application	962
Pond Dredging	6
Planting/Transplanting	76
Prescribed Fire	898
Research	25
Seeding	2,950
Stream Channel	50
Lop-and-Scatter/Burn	9,314
Other Veg. Improvements	365
Total Acres Treated (may overlap)	34,813



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

BRIAN C. STEED
Executive Director

Division of Wildlife Resources

MICHAL D. FOWLKS
Division Director

MEMORANDUM

Date: Oct 30, 2020

To: Wildlife Board and Regional Advisory Council Members

From: Chad Wilson, Private Lands/Public Wildlife Coordinator

Subject: **2021 Cooperative Wildlife Management Unit (CWMU) and Landowner Association (LOA) permit recommendations**

The following is a summary of the 2021 CWMU recommendations for bucks and bulls. There are three types of applications the DWR receives for CWMUs: new, renewal and change applications. Three CWMUs are not being recommended to renew. One CWMU did not turn in the application on time, another CWMU did not have a complete application, and the final one we are recommending denial.

The DWR received **91** CWMU applications for 2021 and recommends the approval of all, except the incomplete application and the recommended denial application:

- 84 renewal applications
- 5 new applications
- 2 change applications that require RAC/Board approval

There will be a total of 126 CWMUs for the 2021 hunting season, based on the DWR's recommendations. The following table summarizes the recommended number of CWMU permits statewide for bucks, bulls and turkeys:

Species	Private	Public
Bull elk	950	138
Buck pronghorn	74	51
Buck deer	1,797	240
Bull moose	39	35
Turkey	12	12
Total	2,872	476



The following is a summary of the DWR's 2021 LOA recommendations for bucks and bulls.

- No new landowner associations.
- A total of 123 buck deer permits, 2 management buck deer, 87 elk, and 9 pronghorn vouchers were **requested** for Landowner Associations for the 2021 season.
- A total of 100 buck deer permits, 1 management buck deer, 64 elk, and 4 pronghorn vouchers are **recommended** for Landowner Associations for the 2021 season.

REGION	CWMU_NAME	SPECIES	Gender	Private	Public	Dates
NRO	5S Land and Livestock	Deer	Buck	9	1	9/01 - 10/31
SRO	Alton	Deer	Management Buck	4	1	8/31-10/31
SRO	Alton	Deer	Premium Buck	18	3	9/01 - 10/31
SRO	Alton	Deer	Cactus Buck	4	1	9/01 - 10/31
SRO	Alton	Elk	Bull	8	2	8/31-10/31
NERO	Antelope Creek	Deer	Buck	2	1	9/01 - 10/31
NERO	Antelope Creek	Pronghorn	Buck	6	3	09/01 - 10/31
NERO	Avintaquin Canyon	Deer	Buck	9	1	09/11 - 11/10
NERO	Avintaquin Canyon	Elk	Bull	3	1	09/01 - 10/31
NRO	Bally Watts	Deer	Buck	18	2	09/11 - 11/10
SRO	Bar J Ranch	Deer	Buck	18	2	09/11 - 11/10
SRO	Bar J Ranch	Elk	Bull	9	2	09/01 - 10/31
CRO	Bear Mountain	Deer	Buck	9	1	09/11 - 11/10
CRO	Bear Mountain	Elk	Bull	6	1	09/01 - 10/31
NRO	Bear Springs	Deer	Buck	9	1	9/01 - 10/31
NRO	Bear Springs	Elk	Bull	9	1	09/01 - 10/31
NRO	Bear Springs	Moose	Bull	1	1	09/01 - 10/31
NRO	Beaver Hollow	Moose	Bull	1	2	09/01 - 10/31
SERO	Black Hawk	Elk	Bull	5	1	09/01 - 10/31
NRO	Blind Springs	Deer	Buck	9	1	09/11 - 11/10
NRO	Blue Spring Hills	Deer	Buck	9	1	09/01 - 10/31
NRO	Bluebell	Deer	Buck	9	1	09/11 - 11/10
SRO	Boobe Hole	Deer	Buck	18	2	9/10 - 11/10
SRO	Boobe Hole	Elk	Bull	14	2	09/01 - 11/20
NERO	Buckhorn Ranch	Deer	Buck	6	1	09/11 - 11/10
SERO	Castle Valley Outdoors	Deer	Buck	7	1	09/11 - 11/10
SERO	Castle Valley Outdoors	Pronghorn	Buck	2	2	09/01 - 10/31
NRO	Chimney Rock	Deer	Buck	18	2	09/11 - 11/10
NRO	Chimney Rock	Elk	Bull	18	2	08/01 - 01/31
NRO	Chimney Rock	Moose	Bull	1	1	08/31 - 11/30
NRO	Clear Creek	Deer	Buck	9	1	09/11 - 11/10
NRO	Coldwater Ranch	Deer	Buck	18	2	09/01 - 10/31
NRO	Coldwater Ranch	Elk	Bull	18	2	09/01 - 10/31
SERO	Conover-Jensen	Deer	Buck	27	3	09/01 - 10/31
SERO	Conover-Jensen	Elk	Bull	6	1	09/01 - 10/31
CRO	Deer Creek	Deer	Buck	9	1	09/11 - 11/10
SERO	Deer Haven	Deer	Buck	13	2	09/01 - 10/31
NRO	Deseret	Deer	Buck	77	14	09/11 - 11/10
NRO	Deseret	Elk	Bull	89	17	09/01 - 10/31
NRO	Deseret	Moose	Bull	2	2	09/01 - 10/31
NRO	Deseret	Pronghorn	Buck	21	16	09/01 - 10/31
NRO	Dilly Ranch	Deer	Buck	9	1	09/11 - 11/10
NRO	Double Cone	Deer	Buck	6	1	09/11 - 11/10
NRO	Double Cone	Elk	Bull	6	1	09/01 - 10/31
CRO	Double R Ranch	Deer	Buck	27	3	09/11 - 11/10
CRO	Double R Ranch	Elk	Bull	9	1	09/01 - 10/31

NRO	Dove Creek	Deer	Buck	18	2 09/11 - 11/10
NRO	Durst Mountain	Deer	Buck	18	2 09/11 - 11/10
NRO	Durst Mountain	Elk	Bull	27	3 09/01 - 10/31
NRO	Durst Mountain	Moose	Bull	2	1 09/01 - 10/31
NRO	East Fork Chalk Creek	Deer	Buck	36	4 09/11 - 11/10
NRO	East Fork Chalk Creek	Elk	Bull	27	3 09/01 - 10/31
NRO	East Fork Chalk Creek	Moose	Bull	3	2 09/01 - 10/31
NRO	Engineer Springs	Deer	Buck	9	1 9/11 - 11/10
NRO	Ensign Ranches	Deer	Buck	36	4 09/11 - 11/10
NRO	Ensign Ranches	Elk	Bull	25	4 09/01 - 10/31
NRO	Ensign Ranches	Moose	Bull	1	1 09/01 - 10/31
NRO	Ensign Ranches	Pronghorn	Buck	3	2 09/01 - 10/31
NRO	Folley Ridge	Deer	Buck	27	3 09/11 - 11/10
NRO	Folley Ridge	Elk	Bull	18	2 09/01 - 10/31
NRO	Folley Ridge	Moose	Bull	1	1 09/01 - 10/31
NRO	Golden Spike	Deer	Buck	9	1 09/01 - 10/31
SRO	Grazing Pasture	Elk	Bull	5	1 09/01 - 10/31
NRO	Green Canyon	Deer	Buck	9	1 09/11 - 11/10
NRO	Guildersleeve	Deer	Buck	18	2 09/11 - 11/10
NRO	Guildersleeve	Elk	Bull	9	1 09/01 - 10/31
NRO	Hardscrabble	Elk	Bull	18	2 09/01 - 10/31
CRO	Heaston East	Deer	Buck	18	2 09/11 - 11/10
CRO	Heaston East	Elk	Bull	20	3 09/01 - 10/31
SERO	Hiawatha	Deer	Buck	9	1 09/11 - 11/10
SERO	Hiawatha	Elk	Bull	7	1 09/01 - 11/30
NERO	Indian Canyon	Deer	Buck	9	1 09/01 - 10/31
NRO	Indian Creek	Deer	Buck	18	2 09/11 - 11/10
SERO	Indian Head	Deer	Buck	18	2 9/1 - 10/31
SERO	Indian Head	Elk	Bull	12	2 09/01 - 10/31
NRO	Ingham Peak	Elk	Bull	4	2 09/01 - 10/31
SRO	Iron Spring	Deer	Buck	9	1 09/11 - 11/10
SRO	Iron Spring	Pronghorn	Buck	1	1 09/01 - 10/31
SERO	J.B. Ranch	Elk	Bull	6	1 09/01 - 10/31
SRO	Johnson Mountain Ranch	Elk	Bull	17	2 09/01 - 10/31
SERO	Jump Creek	Elk	Bull	4	1 09/01 - 10/31
NRO	Junction Valley	Moose	Bull	1	1 09/01 - 10/31
NERO	Little Red Creek	Deer	Buck	9	1 09/11 - 11/10
NERO	Little Red Creek	Elk	Bull	12	2 09/01 - 10/31
NRO	Lone Tree Tunnel Hollow	Deer	Buck	18	2 09/11 - 11/10
NRO	Lone Tree Tunnel Hollow	Elk	Bull	18	2 09/01 - 10/31
NRO	Middle Ridge	Deer	Buck	11	4 09/11 - 11/10
SERO	Minnie Maud Ridge	Elk	Bull	36	4 09/01 - 10/31
NERO	Moon Ranch	Deer	Buck	9	1 09/11 - 11/10
NERO	Moon Ranch	Elk	Bull	9	2 09/01 - 10/31
NERO	Moon Ranch	Moose	Bull	0	1 09/01 - 10/31
NRO	Mountain Meadow	Deer	Buck	9	1 9/11 - 11/10
NRO	Mountain Top	Elk	Bull	27	3 09/01 - 10/31

SRO	Mt Carmel	Deer	Buck	18	2 9/11 - 11/10
NRO	North Peaks	Deer	Buck	18	2 9/11 - 11/10
NRO	North Peaks	Elk	Bull	6	1 09/01 - 10/31
NRO	North Promontory	Deer	Buck	18	2 09/11 - 11/10
NRO	Nucor West	Deer	Buck	9	1 9/1-10/31
SRO	Oak Ranch	Deer	Buck	16	3 9/11 - 11/10
SRO	Old Woman Plateau	Deer	Buck	9	3 09/11 - 11/10
SRO	Old Woman Plateau	Elk	Bull	8	2 09/01 - 10/31
SRO	Pahvant Ensign	Elk	Bull	6	1 09/01 - 10/31
NRO	Park Valley	Pronghorn	Buck	2	2 09/01 - 10/31
NRO	Park Valley Hereford	Deer	Buck	30	10 9/11-11/10
SERO	Patmos Ridge	Deer	Buck	9	1 09/11 - 11/10
SERO	Patmos Ridge	Elk	Bull	5	1 09/01 - 10/31
NRO	Pisgah Mountain	Deer	Buck	18	2 09/11 - 11/10
NRO	Plymouth Peak	Deer	Buck	9	1 09/11 - 11/10
NRO	Pocatello Valley	Deer	Buck	9	1 09/01 - 10/31
NRO	Powder Mountain	Deer	Buck	9	1 9/01 - 10/31
NRO	Powder Mountain	Elk	Bull	3	1 09/01 - 10/31
NRO	Powder Mountain	Moose	Bull	1	1 09/01 - 10/31
SERO	Preston Nutter Ranch	Deer	Buck	9	1 09/01 - 10/31
SERO	Preston Nutter Ranch	Elk	Bull	18	2 09/01 - 10/31
NRO	Promontory Point	Deer	Buck	9	1 9/11 - 11/10
SERO	Redd Ranches	Elk	Bull	17	2 09/01 - 10/31
NRO	Riverview Ranch LLC	Elk	Bull	5	2 09/01 - 10/31
NRO	RLF Deep Creek	Pronghorn	Buck	3	2 09/01 - 10/31
SERO	Roan Cliffs	Deer	Buck	9	1 09/01 - 10/31
SERO	Roan Cliffs	Elk	Bull	9	1 09/01 - 10/31
NRO	Rosette	Deer	Buck	2	1 09/01 - 10/31
NRO	Royal Ivory Outfitters	Elk	Bull	17	3 09/01 - 10/31
NERO	Sand Creek	Deer	Buck	9	1 09/11 - 11/10
NERO	Sand Creek	Elk	Bull	8	1 09/01 - 10/31
NERO	Sand Creek	Moose	Bull	0	1 09/01 - 10/31
SERO	Scofield Canyons	Deer	Buck	9	1 09/11 - 11/10
SERO	Scofield Canyons	Elk	Bull	7	1 09/01 - 10/31
SERO	Scofield East	Elk	Bull	7	1 09/01 - 10/31
SERO	Scofield West	Deer	Buck	13	2 09/01 - 10/31
SERO	Scofield West	Elk	Bull	8	1 09/01 - 10/31
NRO	Sharp Mountain	Deer	Buck	18	2 09/01 - 10/31
NRO	Sharp Mountain	Elk	Bull	18	2 09/01 - 10/31
NRO	Sharp Mountain	Moose	Bull	1	1 09/01 - 10/31
NRO	SJ Ranch	Elk	Bull	7	1 09/01 - 10/31
NRO	SJ Ranch	Moose	Bull	1	1 09/01 - 10/31
NRO	Skull Crack	Deer	Buck	9	1 09/11 - 11/10
NRO	Skull Crack	Elk	Bull	9	1 09/01 - 10/31
NRO	Skull Crack	Moose	Bull	3	2 09/01 - 10/31
CRO	Skull Valley South	Deer	Buck	9	1 09/11 - 11/10
CRO	Skull Valley South	Pronghorn	Buck	2	1 09/01 - 10/31

SERO	Soldier Summit	Deer	Buck	18	2 9/1 - 10/31
SERO	Soldier Summit	Elk	Bull	13	2 09/01 - 10/31
NRO	South Canyon	Deer	Buck	9	2 09/11 - 11/10
NRO	South Canyon	Elk	Bull	9	2 09/01 - 10/31
NRO	South Canyon	Moose	Bull	1	1 09/01 - 10/31
NRO	Spring Creek Acres	Deer	Buck	8	1 09/11 - 11/10
SERO	Spring Creek/Dodge	Deer	Buck	48	5 09/01 - 10/31
SERO	Spring Creek/Dodge	Elk	Bull	10	2 09/01 - 10/31
NRO	Strawberry Ridge	Elk	Bull	18	2 09/01 - 10/31
SERO	Summit Point	Elk	Bull	3	1 09/01 - 10/31
NRO	Thatcher Mountain	Deer	Buck	9	1 09/01 - 10/31
NRO	The Rose of Snowville	Pronghorn	Buck	3	2 09/01 - 10/31
CRO	Three C	Deer	Buck	18	2 09/11 - 11/10
CRO	Three C	Elk	Bull	8	2 09/01 - 10/31
CRO	Three C	Moose	Bull	1	1 09/01 - 10/31
NRO	Two Bear	Deer	Buck	9	1 09/11 - 11/10
NRO	Two Bear	Elk	Bull	36	4 09/01 - 10/31
NRO	Two Bear	Moose	Bull	2	2 09/01 - 10/31
CRO	Wallsburg	Deer	Buck	9	1 09/11 - 11/10
CRO	Wallsburg	Elk	Bull	11	2 09/01 - 10/31
CRO	Wallsburg	Moose	Bull	0	1 09/01 - 10/31
NRO	Washakie	Deer	Buck	9	1 09/11 - 11/10
NRO	Weber Florence Creek	Deer	Buck	45	5 09/01 - 10/31
NRO	Weber Florence Creek	Elk	Bull	63	7 09/01 - 10/31
NRO	Weber Florence Creek	Moose	Bull	4	3 09/01 - 10/31
SERO	West Ridge	Deer	Buck	22	3 9/11 - 11/10
SERO	West Ridge	Elk	Bull	9	1 09/01 - 10/31
CRO	Westlake	Pronghorn	Buck	4	3 09/01 - 10/31
SRO	Zane	Pronghorn	Buck	3	2 09/01 - 10/31

Ratio	Status	Private Acr	Public Acre	UNIT	County	Year
90:10	New	5,996	0	5	Morgan	2021
90:10	Renewal	35,479	1,860	27	Kane	2021
90:10	Renewal	35,479	1,860	27	Kane	2021
90:10:00	Renewal	35,479	1,860	27	Kane	2021
80:20	Renewal	35,479	1,860	27	Kane	2021
90:10	Renewal	21,252	0	11A	Duchesne	2021
60:40	Renewal	21,252	0	11A	Duchesne	2021
90:10	Renewal	10,016	0	17C	Duchesne	2021
75:25	Renewal	10,016	0	17C	Duchesne	2021
90:10	Renewal	10,305	0	4	Morgan	2021
90:10	Renewal	5,970	330	25A	Sevier	2021
80:20	Renewal	5,970	330	25A	Sevier	2021
90:10	Renewal	8,900	0	16A	Sanpete	2021
85:15	Renewal	8,900	0	16A	Sanpete	2021
90:10	Renewal	14,122	0	3	Weber	2021
90:10	Renewal	14,122	0	3	Weber	2021
60:40	Renewal	14,122	0	3	Weber	2021
60:40	Renewal	14,000	0	4	Morgan	2021
85:15	Renewal	11,778	0	11B	Carbon	2021
90:10	Renewal	5,169	0	1	Box Elder	2021
90:10	Renewal	8,760	0	1	Box Elder	2021
90:10	Renewal	7,480	0	3	Cache	2021
90:10	Renewal	12,000	0	25A	Sevier	2021
90:10	Renewal	12,000	0	25A	Sevier	2021
90:10	Renewal	6,475	0	17B	Wasatch	2021
90:10	Renewal	12,100	80	16C	Emery	2021
60:40	Renewal	12,100	80	16C	Emery	2021
90:10	Renewal	38,828	0	4	Morgan	2021
90:10	Renewal	38,828	0	4	Morgan	2021
60:40	Renewal	38,828	0	4	Morgan	2021
90:10	Renewal	5,128	0	1	Box Elder	2021
90:10	Renewal	33,667	0	3	Cache	2021
90:10	Renewal	33,667	0	3	Cache	2021
90:10	Renewal	10,805	40	11B	Carbon	2021
80:20	Renewal	10,805	40	11B	Carbon	2021
90:10	Renewal	7,956	0	17A	Wasatch	2021
90:10	Renewal	15,194	0	14A	San Juan	2021
90:10	Renewal	225,228	15,359	4	Rich	2021
90:10	Renewal	225,228	15,359	4	Rich	2021
60:40	Renewal	225,228	15,359	4	Rich	2021
60:40	Renewal	225,228	15,359	4	Rich	2021
90:10	Renewal	7,537	0	1	Box Elder	2021
90:10	Renewal	5,329	4,365	1	Box Elder	2021
90:10	Renewal	5,329	4,365	1	Box Elder	2021
90:10	Renewal	12,242	0	17A	Wasatch	2021
90:10	Renewal	12,242	0	17A	Wasatch	2021

90:10	Renewal	18,770	570 1	Box Elder	2021
90:10	Renewal	26,358	0 4	Morgan	2021
90:10	Renewal	26,358	0 4	Morgan	2021
60:40	Renewal	26,358	0 4	Morgan	2021
90:10	Renewal	15,260	0 6	Summit	2021
90:10	Renewal	15,260	0 6	Summit	2021
60:40	Renewal	15,260	0 6	Summit	2021
90:10	Renewal	21,943	0 1	Box Elder	2021
90:10	Renewal	82,246	0 6	Summit	2021
85:15	Renewal	82,246	0 6	Summit	2021
60:40	Renewal	82,246	0 6	Summit	2021
60:40	Renewal	82,246	0 6	Summit	2021
90:10	Renewal	18,260	0 4	Morgan	2021
90:10	Renewal	18,260	0 4	Morgan	2021
60:40	Renewal	18,260	0 4	Morgan	2021
90:10	Renewal	16,556	0 1	Box Elder	2021
80:20	Renewal	6,700	0 25a	Sevier	2021
90:10	Renewal	5,790	90 3	Cache	2021
90:10	Renewal	8,000	0 4	Morgan	2021
90:10	Renewal	8,000	0 4	Morgan	2021
90:10	Renewal	17,623	0 5	Morgan	2021
90:10	Renewal	63,965	0 18	Salt Lake	2021
85:15	Renewal	63,965	0 18	Salt Lake	2021
90:10	Renewal	16,129	0 16B	Carbon	2021
85:15	Renewal	16,129	0 16B	Carbon	2021
90:10	New	5,794	0 17C	Duchesne	2021
90:10	Renewal	7,342	30 1	Box Elder	2021
90:10	Renewal	21,494	1,040 17C	Carbon	2021
85:15	Renewal	21,494	1,040 17C	Carbon	2021
90:10	Renewal	16,628	4,160 1	Box Elder	2021
90:10	New	7,258	0 30	Iron	2021
60:40	New	7,258	0 30	Iron	2021
80:20	Renewal	9,162	0 13a	Grand	2021
90:10	Renewal	13,200	91 25a	Sevier	2021
80:20	Renewal	7,255	0 16B	Carbon	2021
60:40	Change	31,525	360 1	Box Elder	2021
90:10	Renewal	18,100	0 17C	Wasatch	2021
85:15	Renewal	18,100	0 17C	Wasatch	2021
90:10	Renewal	10,494	0 5	Morgan	2021
90:10	Renewal	10,494	0 5	Morgan	2021
90:10	Renewal	5,188	1,337 4	Rich	2021
90:10	Renewal	16,125	80 11b	Carbon	2021
90:10	Renewal	13,000	0 17C	Duchesne	2021
85:15	Renewal	13,000	0 17C	Duchesne	2021
60:40	Renewal	13,000	0 17C	Duchesne	2021
90:10	Renewal	7,947	1	Box Elder	2021
90:10	Renewal	10,480	0 5	Summit	2021

90/10	Renewal	14,882	460 29	Kane	2021
90:10	Renewal	26,244	2,040 1	Box Elder	2021
90:10	Renewal	26,244	2,040 1	Box Elder	2021
90:10	Renewal	20,790	0 1	Box Elder	2021
90:10	Renewal	6,416	0 1	Box Elder	2021
90/10	Renewal	4,980	120 16A	Sevier	2021
90:10	Renewal	6,840	1,280 16A	Sevier	2021
90:10	Renewal	6,840	1,280 16A	Sevier	2021
90:10	Renewal	37,351	0 21B	Millard	2021
60:40	Renewal	5,408	0 1	Box Elder	2021
90:10	Renewal	12,253	2,180 1	Box Elder	2021
90:10	Renewal	15,865	0 11B	Carbon	2021
90:10	Renewal	15,865	0 11B	Carbon	2021
90:10	Renewal	5,221	0 3	Cache	2021
90:10	Renewal	5,179	0 1	Box Elder	2021
90:10	Renewal	8,510	0 1	Box Elder	2021
90:10	Renewal	11,582	0 3	Weber	2021
75:25	Renewal	11,582	0 3	Weber	2021
60:40	Renewal	11,582	0 3	Weber	2021
90:10	Renewal	26,851	0 11B	Carbon	2021
90:10	Renewal	26,851	0 11B	Carbon	2021
90:10	Renewal	19,498	0 1	Box Elder	2021
90:10	Renewal	19,048	0 13a	San Juan	2021
80:20	Renewal	19,817	13,895 1	Box Elder	2021
60:40	Renewal	11,129	0 1	Box Elder	2021
90:10	Renewal	10,045	480 11B	Carbon	2021
90:10	Renewal	10,045	480 11B	Carbon	2021
90:10	Renewal	5,305	0 1	Box Elder	2021
85:15	Change	10,555	0 8	Summit	2021
90:10	Renewal	10,200	0 17B	Duchesne	2021
85:15	Renewal	10,200	0 17B	Duchesne	2021
60:40	Renewal	10,200	0 17B	Duchesne	2021
90:10	Renewal	12,310	40 16B	Utah	2021
85:15	Renewal	12,310	40 16B	Utah	2021
85:15	Renewal	10,124	0 16B	Carbon	2021
90:10	Renewal	11,565	0 16B	Carbon	2021
80:20	Renewal	11,565	0 16B	Carbon	2021
90:10	Renewal	17,650	0 3	Cache	2021
90:10	Renewal	17,650	0 3	Cache	2021
60:40	Renewal	17,650	0 3	Cache	2021
90:10	Renewal	6,476	0 2	Cache	2021
60:40	Renewal	6,476	0 2	Cache	2021
90:10	Renewal	27,961	0 4	Weber	2021
90:10	Renewal	27,961	0 4	Weber	2021
60:40	Renewal	27,961	0 4	Weber	2021
90:10	Renewal	60,813	0 18	Tooele	2021
60:40	Renewal	60,813	0 18	Tooele	2021

90:10	Renewal	22,218	0 16B	Utah	2021
85:15	Renewal	22,218	0 16B	Utah	2021
90:10	Renewal	16,260	480 3	Cache	2021
90:10	Renewal	16,260	480 3	Cache	2021
60:40	Renewal	16,260	480 3	Cache	2021
90:10	Renewal	6,600	0 3	Cache	2021
90:10	Renewal	83,690	0 14A	San Juan	2021
85:15	Renewal	83,690	0 14A	San Juan	2021
90:10	Renewal	26,220	48 2	Rich	2021
75:25	Renewal	26,118	0 14A	San Juan	2021
90:10	Renewal	5,411	0 1	Box Elder	2021
60:40	Renewal	13,224	0 1	Box Elder	2021
90:10	Renewal	14,676	0 17A	Wasatch	2021
80:20	Renewal	14,676	0 17A	Wasatch	2021
60:40	Renewal	14,676	0 17A	Wasatch	2021
90:10	Renewal	35,351	0 6	Summit	2021
90:10	Renewal	35,351	0 6	Summit	2021
60:40	Renewal	35,351	0 6	Summit	2021
90:10	Renewal	11,278	0 17A	Wasatch	2021
85:15	Renewal	11,278	0 17A	Wasatch	2021
60:40	Renewal	11,278	0 17A	Wasatch	2021
90:10	Renewal	14,516	0 1	Box Elder	2021
90:10	Renewal	36,915	0 6	Summit	2021
90:10	Renewal	36,915	0 6	Summit	2021
60:40	Renewal	36,915	0 6	Summit	2021
90:10	New	15,384	0 11B	Carbon	2021
90:10	New	15,384	0 11B	Carbon	2021
60:40	Renewal	18,717	0 19A	Utah	2021
60:40	Renewal	9,635	0 20	Iron	2021

Hunt_Area	Species	Requested	Qualified	Recommended	Approved Last Renewal	Board Approved	Exp. Expiration
Book Cliffs, North	Elk	9	2	2	6		September 1, 2023
Book Cliffs, North	Pronghorn	3	2	2	2		September 1, 2023
Book Cliffs, North	Deer	13	10	10	13		September 1, 2023
West Desert, Deep Creek	Elk	2	1 every 3 yrs	1 every 3 years	2		September 1, 2023
South Slope, Diamond Mountain	Deer	53	50	50	48		September 1, 2023
South Slope, Diamond Mountain	Elk	31	30	30	31		September 1, 2023
San Juan, Elk Ridge	Deer	2	0.25	1 every 3 years	2		September 1, 2023
Henry Mtns	Deer	1 every 3 yrs	same	same	same		September 1, 2023
Southwest Desert	Elk	4	4	4	4		September 1, 2023
Monroe	Elk	4	2	2	4		September 1, 2023
Fillmore, Pahvant	Elk	6	4	4	6		September 1, 2023
Panguitch Lake	Elk	7	3.26	3	5		September 1, 2023
Paunsaugunt	Deer	18	7	7	18		September 1, 2023
Paunsaugunt	Mgmt deer	2	1	1	1		September 1, 2023
Paunsaugunt	Elk	6	6.37	6	6		September 1, 2023
Pilot Mountain	Elk	8	4	4	2		September 1, 2023
San Juan, Bull Elk	Elk	5	6	6	5		September 1, 2023
Mt Dutton/Paunsaugunt, Johns Valley	Pronghorn	6	2.3	2	6		September 1, 2023
North Slope, Three Corners	Elk	5	2	2	5		September 1, 2023
West Desert, Vernon	Deer	36	31	31	28		September 1, 2023

Renews next year

Oak Creek

1-Sep-21