

WHEATGRASS HOLLOW - TREND STUDY NO. 4-13-11

Vegetation Type: Wyoming Big Sagebrush

Range Type: Crucial Deer Winter, Crucial Elk Winter

NRCS Ecological Site Description: [Semidesert Loam \(Wyoming Big Sagebrush\), R034XY212UT](#)

Land Ownership: BLM

Elevation: 6,700 ft (2,042 m)

Aspect: Southeast

Slope: 10%

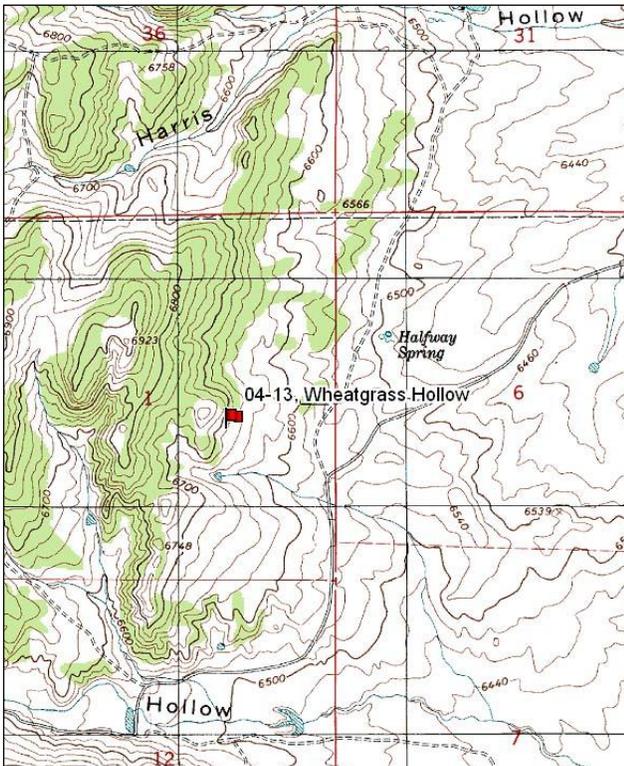
Transect bearing: 135° magnetic

Belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft)

Directions:

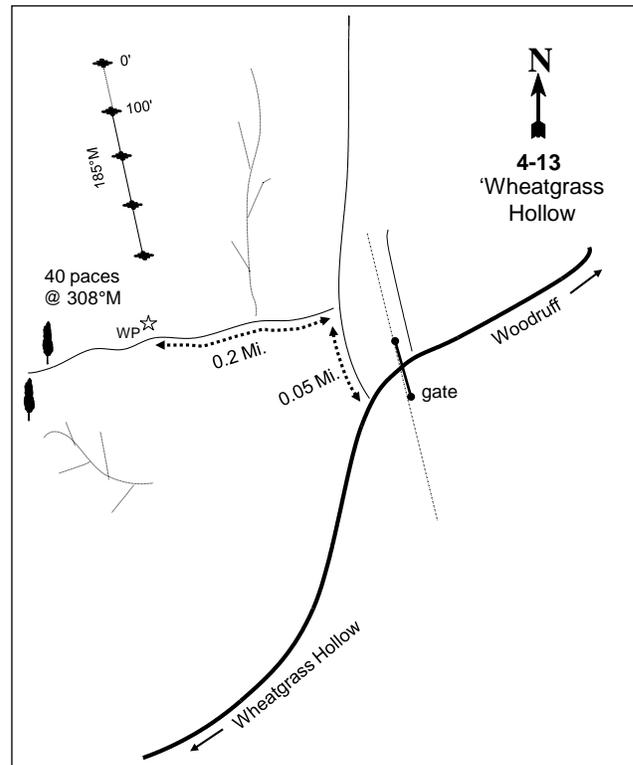
Where Highway SR-16 bends to the east on the south side of Woodruff, continue straight on Deseret Road (South Main). Go 2.5 miles and turn right (west) onto the Wheatgrass Road. Go 3.25 miles, crossing several cattleguards, to the fourth cattleguard. Continue past this cattleguard to a fork. Go north 0.05 miles to a fork with a faint road on the left. Go 0.2 miles west on the faint road to a witness post. From the witness post, walk 40 paces at 308 degrees magnetic to the 400-foot baseline stake. The 0-foot baseline stake is located 400 feet to the north at a bearing of 315 degrees magnetic.

Map Name: Neponset Reservoir NW



Township: 8N Range: 6E Section: 1

Diagrammatic Sketch:



GPS: NAD 83, UTM 12S 482151 E 4589549 N

WHEATGRASS HOLLOW - TREND STUDY NO. 4-13

Site Information

Site Description: The study is located on Bureau of Land Management (BLM) administered land, surrounded by Deseret Land and Livestock properties about six miles south of Woodruff in Wheatgrass Hollow. The study samples a Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) community, with scattered Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus edulis*), and a sparse understory. The woodland is moderately dense on the ridge above the study area. Deer pellet groups have been sampled in moderate to high abundance since 2001. Sampled elk and cattle sign has been minimal throughout the duration of the study (Table - Pellet Group Data).

Browse: Wyoming big sagebrush is the only abundant shrub. The sagebrush population is comprised of a moderately high density stand of smaller, somewhat prostrate plants. Utilization of sagebrush has been mostly light to moderate, but with some years of heavy use. Decadence has been moderate to high over the course of the study. Vigor has been mostly good, but poor vigor was high in 2011. Recruitment of young plants has been good throughout the sample years. A few shadscale (*Atriplex confertifolia*), stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), greasewood (*Sarcobatus vermiculatus*), and prickly pear (*Opuntia* sp.) also occupy the site (Table - Browse Characteristics). A moderately dense, but scattered population of Utah juniper occurs across the site (Table - Point-Quarter Tree Data). The majority of sampled trees were less than four feet tall.

Herbaceous Understory: The herbaceous understory is comprised mainly of the native grass Sandberg bluegrass (*Poa secunda*). Other perennial grass species which occur less frequently include western wheatgrass (*Agropyron smithii*), bluebunch wheatgrass (*A. spicatum*), bottlebrush squirreltail (*Sitanion hystrix*), and needle-and-thread (*Stipa comata*). Forbs are not prevalent on the site. The most abundant species are longleaf phlox (*Phlox longifolia*), Hoods phlox (*Phlox hoodii*), and rose pussytoes (*Antennaria rosea*) (Table - Herbaceous Trends).

Soil: The soil is in the Lariat fine sandy loam series, which occur on upland slopes and hillslopes. Parent material consists of residuum weathered from sandstone. The soil is characterized as moderately deep, well drained, with moderately rapid permeability (Soil Survey Staff 2011). Soil texture is a sandy clay loam with a neutral soil reaction (pH 7.2). Bare ground cover is moderate, with moderate amount of vegetation, litter, and pavement cover (Table - Basic Cover). There is good ground cover under shrub crowns, but the interspaces are largely bare. The soil erosion condition has been classified as stable since 2001.

Trend Assessments

Browse:

- **1990 to 1996 - slightly up (+1):** Differences in density may be related to the larger sample area used in 1996; therefore, trend was determined using other parameters. Decadence of Wyoming big sagebrush decreased from 55% to 25%, and poor vigor decreased from 19% to 5%. Recruitment of young sagebrush plants decreased from 25% to 11%, but is still considered to be good.
- **1996 to 2001 - up (+2):** Density of sagebrush increased 44% from 5,940 plants/acre to 8,560 plants/acre, and cover increased from 23% to 26%. Recruitment of young sagebrush plants increased to 23% of the population.
- **2001 to 2006 - stable (0):** Sagebrush density and cover remained similar at 8,100 plants/acre and 26%, respectively. Decadence increased slightly from 23% to 31%, and poor vigor increased from 7% to 12%. Recruitment of young sagebrush plants decreased to 12%.
- **2006 to 2011 - slightly down (-1):** The density of sagebrush decreased 9% to 7,380 plants/acre, which is a 13% decrease since 2001. Cover of sagebrush decreased to 23%. Decadence decreased to 24%,

but poor vigor increased to 28%. Recruitment of young sagebrush plants decreased to 9%, the lowest in the sample years.

Grass:

- **1990 to 1996 - stable (0):** There was little change in the sum of nested frequency of perennial grasses.
- **1996 to 2001 - stable (0):** The sum of nested frequency and cover of perennial grasses remained similar.
- **2001 to 2006 - slightly up (+1):** The perennial grass sum of nested frequency increased 12%, and cover increased from 10% to 12%. There was a significant increase in the nested frequency of bottlebrush squirreltail.
- **2006 to 2011 - stable (0):** The sum of nested frequency of perennial grasses remained similar, though cover decreased to 8%.

Forb:

- **1990 to 1996 - up (+2):** The sum of nested frequency of perennial forbs increased 34%, but most of the increase came from an increase in the low value forb Hoods phlox.
- **1996 to 2001 - slightly down (-1):** The sum of nested frequency of perennial forbs decreased 17% due to a decrease in the low value forb longleaf phlox. Forb composition remains poor.
- **2001 to 2006 - slightly up (+1):** The sum of nested frequency of perennial forbs increased 17%, which is primarily due to an increase in the nested frequency of rose pussytoes. Cover for perennial forbs increased from 2% to 3%.
- **2006 to 2011 - stable (0):** There was a slight increase in the sum of nested frequency of perennial forbs, but cover decreased to 2%.

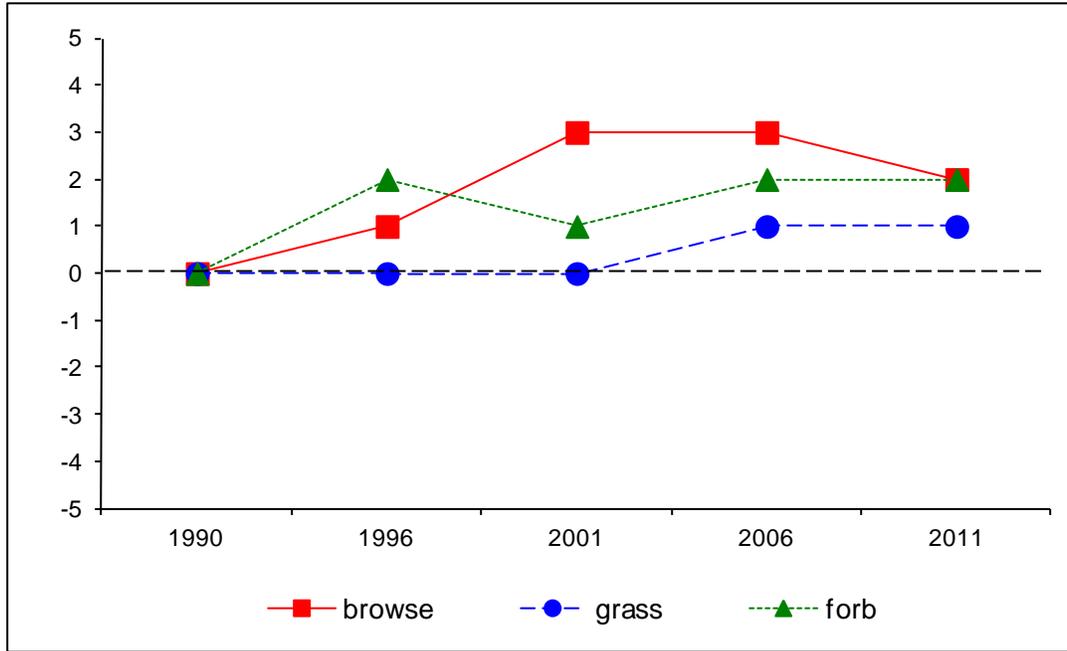
DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 4, study no: 13

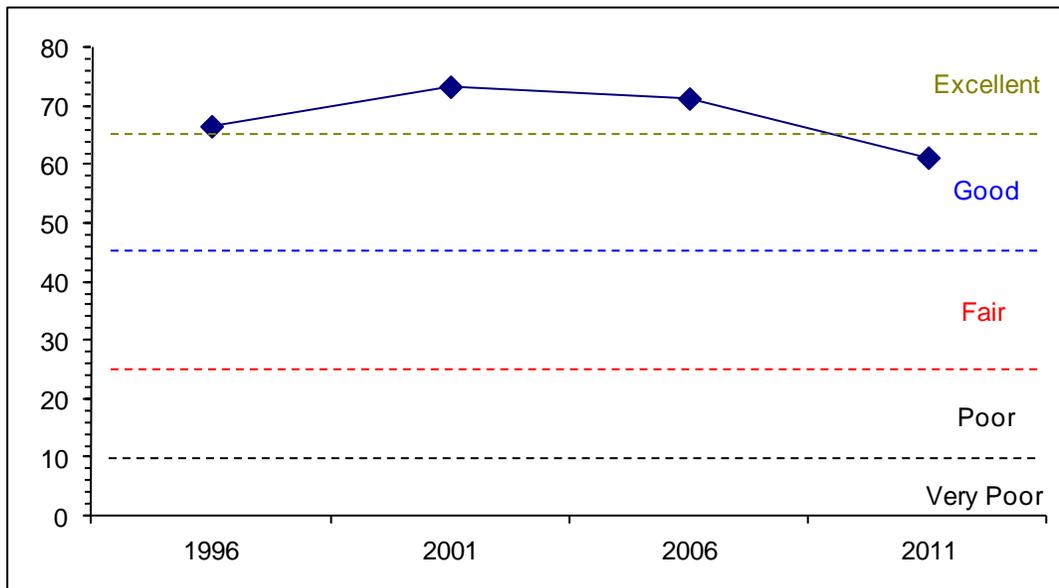
| Year | Preferred Browse Cover | Preferred Browse Decadence | Preferred Browse Young | Perennial Grass Cover | Annual Grass Cover | Perennial Forb Cover | Noxious Weeds | Total Score | Ranking |
|------|------------------------|----------------------------|------------------------|-----------------------|--------------------|----------------------|---------------|-------------|----------------|
| 96 | 29.3 | 7.5 | 5.5 | 20.3 | 0.0 | 4.1 | 0.0 | 66.6 | Good-Excellent |
| 01 | 30.0 | 8.1 | 11.5 | 20.6 | -0.1 | 3.3 | 0.0 | 73.4 | Excellent |
| 06 | 30.0 | 5.7 | 6.0 | 23.8 | -0.1 | 5.9 | 0.0 | 71.3 | Excellent |
| 11 | 28.7 | 7.8 | 4.5 | 16.2 | -0.1 | 4.1 | 0.0 | 61.2 | Good |

Trend Summary

CUMULATIVE RANGE TREND ASSESSMENT--
 Management unit 4 Study no: 13



DEER DESIRABLE COMPONENTS INDEX TREND, LOW POTENTIAL SCALE--
 Management unit 4, Study no: 13



HERBACEOUS TRENDS--
Management unit 04, Study no: 13

| Type | Species | Nested Frequency | | | | | Average Cover % | | | |
|-----------------------------|-----------------------------|------------------|------|-------|-------|------|-----------------|-------|-------|------|
| | | '90 | '96 | '01 | '06 | '11 | '96 | '01 | '06 | '11 |
| G | Agropyron cristatum | - | - | - | 3 | 2 | - | - | .03 | .03 |
| G | Agropyron smithii | - | a- | b14 | bc36 | c64 | - | .08 | .43 | .78 |
| G | Agropyron spicatum | c71 | a15 | b47 | ab24 | a8 | .26 | 1.02 | .55 | .04 |
| G | Bromus tectorum (a) | - | 27 | 29 | 45 | 41 | .05 | .10 | .18 | .09 |
| G | Carex sp. | 1 | - | - | 1 | 8 | - | - | .00 | .04 |
| G | Oryzopsis hymenoides | 7 | 8 | 3 | 5 | 4 | .22 | .01 | .06 | .01 |
| G | Poa secunda | bc307 | c310 | bc294 | ab281 | a246 | 8.73 | 8.43 | 8.80 | 5.03 |
| G | Sitanion hystrix | ab23 | bc38 | a7 | cd63 | d74 | .39 | .21 | 1.27 | 1.25 |
| G | Stipa comata | 16 | 15 | 36 | 35 | 29 | .54 | .52 | .76 | .91 |
| Total for Annual Grasses | | 0 | 27 | 29 | 45 | 41 | 0.05 | 0.10 | 0.18 | 0.09 |
| Total for Perennial Grasses | | 425 | 386 | 401 | 448 | 435 | 10.15 | 10.28 | 11.92 | 8.12 |
| Total for Grasses | | 425 | 413 | 430 | 493 | 476 | 10.21 | 10.39 | 12.10 | 8.22 |
| F | Agoseris glauca | - | 1 | - | - | - | .00 | - | - | - |
| F | Allium sp. | a- | a- | a- | a5 | b46 | - | - | .02 | .22 |
| F | Antennaria rosea | a17 | a24 | ab32 | b52 | a26 | .38 | .20 | .66 | .17 |
| F | Arabis sp. | 4 | 3 | - | - | 7 | .00 | - | - | .02 |
| F | Astragalus convallarius | - | - | 2 | 6 | 6 | - | .03 | .06 | .05 |
| F | Astragalus spatulatus | a- | ab9 | b14 | a- | ab12 | .09 | .07 | .00 | .03 |
| F | Astragalus utahensis | - | 3 | 3 | - | - | .00 | .00 | - | - |
| F | Collinsia parviflora (a) | - | - | - | - | 3 | - | - | - | .00 |
| F | Cordylanthus ramosus (a) | - | a- | c49 | b22 | d106 | - | .59 | .28 | 4.31 |
| F | Cryptantha sp. | - | 1 | - | 8 | 6 | .03 | - | .07 | .01 |
| F | Erigeron pumilus | 13 | 10 | 6 | 13 | 6 | .02 | .01 | .05 | .04 |
| F | Gayophytum ramosissimum(a) | - | - | - | - | 5 | - | - | - | .01 |
| F | Holosteum umbellatum (a) | - | - | - | - | 3 | - | - | - | .01 |
| F | Lappula occidentalis (a) | - | - | 1 | - | 3 | - | .00 | - | .00 |
| F | Orobanche sp. | - | 3 | - | - | 1 | .00 | - | - | .03 |
| F | Phlox hoodii | a90 | b119 | ab114 | ab96 | a83 | 1.39 | 1.26 | 1.84 | 1.29 |
| F | Phlox longifolia | b43 | b50 | a14 | ab37 | b46 | .12 | .06 | .25 | .18 |
| F | Ranunculus testiculatus (a) | - | - | - | - | 4 | - | - | - | .01 |
| F | Veronica biloba (a) | - | - | - | - | 2 | - | - | - | .00 |
| Total for Annual Forbs | | 0 | 0 | 50 | 22 | 126 | 0 | 0.59 | 0.28 | 4.37 |
| Total for Perennial Forbs | | 167 | 223 | 185 | 217 | 239 | 2.05 | 1.64 | 2.97 | 2.06 |
| Total for Forbs | | 167 | 223 | 235 | 239 | 365 | 2.05 | 2.24 | 3.25 | 6.43 |

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS--

Management unit 04, Study no: 13

| Type | Species | Strip Frequency | | | | Average Cover % | | | |
|------------------|---|-----------------|-----|-----|-----|-----------------|-------|-------|-------|
| | | '96 | '01 | '06 | '11 | '96 | '01 | '06 | '11 |
| B | Artemisia tridentata wyomingensis | 99 | 95 | 98 | 97 | 23.40 | 25.77 | 26.35 | 22.92 |
| B | Atriplex confertifolia | 3 | 2 | 2 | 1 | - | .03 | .03 | - |
| B | Chrysothamnus viscidiflorus viscidiflorus | 15 | 10 | 10 | 14 | .09 | .33 | .18 | .03 |
| B | Juniperus osteosperma | 1 | 1 | 2 | 1 | .00 | - | .30 | .00 |
| B | Opuntia sp. | 18 | 18 | 21 | 19 | - | - | - | - |
| B | Sarcobatus vermiculatus | 1 | 0 | 0 | 0 | .04 | .07 | .20 | .37 |
| Total for Browse | | 137 | 126 | 133 | 132 | 23.54 | 26.20 | 27.07 | 23.34 |

CANOPY COVER, LINE INTERCEPT--

Management unit 04, Study no: 13

| Species | Percent Cover | |
|---|---------------|-------|
| | '06 | '11 |
| Artemisia tridentata wyomingensis | 24.10 | 24.08 |
| Atriplex confertifolia | .16 | - |
| Chrysothamnus viscidiflorus viscidiflorus | .60 | .55 |
| Juniperus osteosperma | - | .18 |
| Opuntia sp. | .11 | .23 |

KEY BROWSE ANNUAL LEADER GROWTH--

Management unit 04, Study no: 13

| Species | Average leader growth (in) | | |
|-----------------------------------|----------------------------|-----|-----|
| | '01 | '06 | '11 |
| Artemisia tridentata wyomingensis | 0.8 | 0.6 | 1.8 |

POINT-QUARTER TREE DATA--

Management unit 04, Study no: 13

| Species | Trees per Acre | | | Average diameter (in) | | |
|-----------------------|----------------|-----|-----|-----------------------|-----|-----|
| | '01 | '06 | '11 | '01 | '06 | '11 |
| Juniperus osteosperma | 58 | 61 | 59 | 3.8 | 2.3 | 2.4 |

BASIC COVER--

Management unit 04, Study no: 13

| Cover Type | Average Cover % | | | | |
|-------------|-----------------|-------|-------|-------|-------|
| | '90 | '96 | '01 | '06 | '11 |
| Vegetation | 8.00 | 34.17 | 39.87 | 43.31 | 34.77 |
| Rock | 5.50 | 3.24 | 2.07 | 2.56 | .60 |
| Pavement | 27.00 | 17.76 | 18.94 | 23.85 | 22.20 |
| Litter | 34.50 | 25.90 | 27.56 | 21.83 | 28.61 |
| Cryptogams | 8.50 | 8.83 | 8.57 | 6.66 | 7.84 |
| Bare Ground | 16.50 | 15.49 | 26.14 | 14.37 | 13.61 |

SOIL ANALYSIS DATA --

Management unit 04, Study no: 13, Study Name: Wheatgrass Hollow

| Effective rooting depth (in) | pH | Sandy-Clay-Loam | | | %OM | PPM P | PPM K | ds/m |
|------------------------------|-----|-----------------|-------|-------|-----|-------|-------|------|
| | | %sand | %silt | %clay | | | | |
| 10.4 | 7.2 | 49.0 | 22.0 | 29.0 | 4.5 | 10.3 | 204.8 | 0.7 |

PELLET GROUP DATA--

Management unit 04, Study no: 13

| Type | Quadrat Frequency | | | | Days use per acre (ha) | | |
|---------------|-------------------|-----|-----|-----|------------------------|---------|----------|
| | '96 | '01 | '06 | '11 | '01 | '06 | '11 |
| Rabbit | 10 | 3 | 26 | 36 | - | - | - |
| Horse | - | 1 | 1 | - | 1 (3) | - | - |
| Elk | 4 | 4 | 4 | 7 | 1 (2) | 2 (5) | 2 (5) |
| Deer/Antelope | 38 | 20 | 18 | 16 | 58 (144) | 28 (69) | 43 (103) |
| Cattle | 1 | 1 | - | - | - | - | 2 (4) |

BROWSE CHARACTERISTICS--

Management unit 04, Study no: 13

| Year | Plants per Acre (excluding seedlings) | Age class distribution | | | Seedling (plants/acre) | Utilization | | % poor vigor | Average Height Crown (in) |
|--|---------------------------------------|------------------------|----------|------------|------------------------|-------------|---------|--------------|---------------------------|
| | | % Young | % Mature | % Decadent | | % moderate | % heavy | | |
| <i>Artemisia tridentata wyomingensis</i> | | | | | | | | | |
| 90 | 6598 | 25 | 20 | 55 | 266 | 24 | 19 | 19 | 19/23 |
| 96 | 5940 | 11 | 65 | 25 | 1120 | 60 | 8 | 5 | 14/33 |
| 01 | 8560 | 23 | 54 | 23 | 260 | 28 | 6 | 7 | 15/28 |
| 06 | 8100 | 12 | 57 | 31 | 4680 | 2 | 1 | 12 | 13/28 |
| 11 | 7380 | 9 | 67 | 24 | 40 | 23 | 31 | 28 | 13/24 |
| <i>Atriplex confertifolia</i> | | | | | | | | | |
| 90 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 96 | 60 | 0 | 100 | - | - | 0 | 0 | 0 | 11/10 |
| 01 | 40 | 0 | 100 | - | - | 0 | 0 | 0 | 15/12 |
| 06 | 40 | 0 | 100 | - | - | 0 | 50 | 0 | 14/15 |
| 11 | 20 | 0 | 100 | - | - | 0 | 100 | 0 | 15/12 |
| <i>Chrysothamnus nauseosus</i> | | | | | | | | | |
| 90 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 96 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- |
| 01 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 3/35 |
| 06 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 25/35 |
| 11 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 31/29 |
| <i>Chrysothamnus viscidiflorus viscidiflorus</i> | | | | | | | | | |
| 90 | 66 | 0 | 100 | 0 | 66 | 100 | 0 | 0 | 6/8 |
| 96 | 460 | 13 | 74 | 13 | - | 0 | 0 | 9 | 10/16 |
| 01 | 280 | 14 | 79 | 7 | - | 14 | 0 | 0 | 10/18 |
| 06 | 240 | 8 | 58 | 33 | - | 0 | 0 | 17 | 10/17 |
| 11 | 460 | 9 | 87 | 4 | - | 0 | 0 | 4 | 11/16 |

| | | Age class distribution | | | | | Utilization | | | |
|--------------------------------|--|------------------------|----------|------------|---------------------------|------------|-------------|--------------|------------------------------|--|
| Year | Plants per Acre (excluding seedlings) | % Young | % Mature | % Decadent | Seedling (plants/acre) | % moderate | % heavy | % poor vigor | Average Height Crown (in) | |
| Juniperus osteosperma | | | | | | | | | | |
| 90 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- | |
| 96 | 20 | 100 | 0 | - | - | 0 | 0 | 0 | -/- | |
| 01 | 20 | 0 | 100 | - | - | 0 | 0 | 0 | -/- | |
| 06 | 40 | 50 | 50 | - | - | 0 | 0 | 0 | -/- | |
| 11 | 20 | 100 | 0 | - | - | 0 | 0 | 0 | -/- | |
| Opuntia sp. | | | | | | | | | | |
| 90 | 332 | 40 | 60 | 0 | 66 | 0 | 0 | 0 | 3/2 | |
| 96 | 540 | 0 | 100 | 0 | 40 | 0 | 0 | 0 | 4/13 | |
| 01 | 720 | 8 | 75 | 17 | - | 8 | 0 | 0 | 3/12 | |
| 06 | 620 | 10 | 81 | 10 | 60 | 0 | 0 | 0 | 4/14 | |
| 11 | 640 | 6 | 94 | 0 | 40 | 0 | 0 | 0 | 4/12 | |
| Sarcobatus vermiculatus | | | | | | | | | | |
| 90 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- | |
| 96 | 20 | 0 | 100 | - | - | 0 | 0 | 0 | 24/18 | |
| 01 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | -/- | |
| 06 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 30/23 | |
| 11 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 32/30 | |