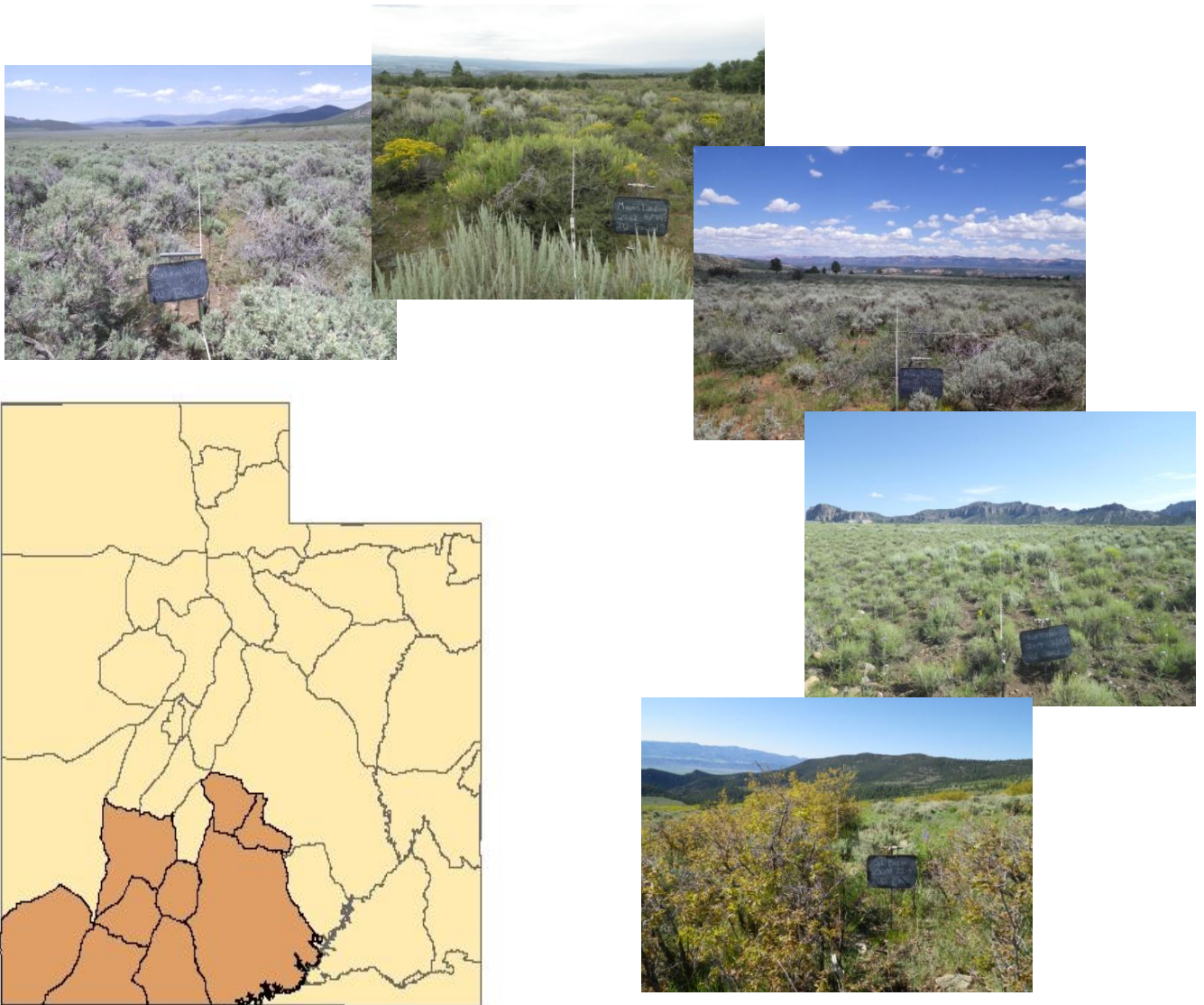


# UTAH BIG GAME RANGE TREND STUDIES 2013 Southern Region



**PUBLICATION NUMBER 14-11  
REPORT FOR FEDERAL AID PROJECT W-82-R-58**

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

**Utah Big Game Range Trend Studies  
2013  
Southern Region**

Written and Edited by

Jason Cox  
Jason Lane  
Jordan Bybee

Tables prepared by

Jason Cox  
Jason Lane  
Jordan Bybee  
Lyndsey Crane  
Tana Newton

Data Collection by

Mckay Braithwaite	Nicole Lucas
Jason Cox	Timothy Remkes
Skyler Farnsworth	Carson Richards
Kin Finicum	Mike Thayne
Kevin Gunnell	Camille Waters
Derek Hedges	Chalese West
Jason Lane	Russell Wimmer

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UTAH DEPARTMENT OF NATURAL RESOURCES  
Division of Wildlife Resources  
1594 West North Temple  
Salt Lake City, Utah 84114

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Reports for all regions, with accompanying photographs, are available online at <http://wildlife.utah.gov/range/>.

<sup>1</sup>Appendix B is only available in digital format and is not available in the printed format.

## PROGRAM NARRATIVE

State: UTAH

Project Number: W-82-R-58

Grant Title: Wildlife Habitat Research and Monitoring

Project Title: Wildlife Habitat Monitoring/Range Trend Studies

Need: The ability to detect changes in vegetation composition (range trend) on big game winter ranges is an important part of the Utah Division of Wildlife Resources (DWR) 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, however on certain management units, studies are located on spring and/or summer ranges, if vegetation composition on these ranges is the limiting factor for big game populations. Range trend data are used by wildlife biologists for habitat improvement planning purposes, reviewing Bureau of Land Management (BLM) and United States Forest Service (USFS) allotment management plans, and as one of several sources of information for revising deer and elk herd unit management plans.

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

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

## REMARKS

The work completed during the 2013 field season and reported in this publication involves the reading of interagency range trend studies in the DWR Southern Region. Most trend studies surveyed in these management units were established in the 1980's and reread at 5 year intervals.

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

### Bureau of Land Management

- Cedar City Field Office
- Grand Staircase-Escalante National Monument
- Kanab Field Office
- Fillmore Field Office
- Richfield Field Office
- St. George Field Office

### Dixie National Forest

- Cedar City Ranger District
- Escalante Ranger District
- Pine Valley Ranger District
- Powell Ranger District
- Teasdale Ranger District

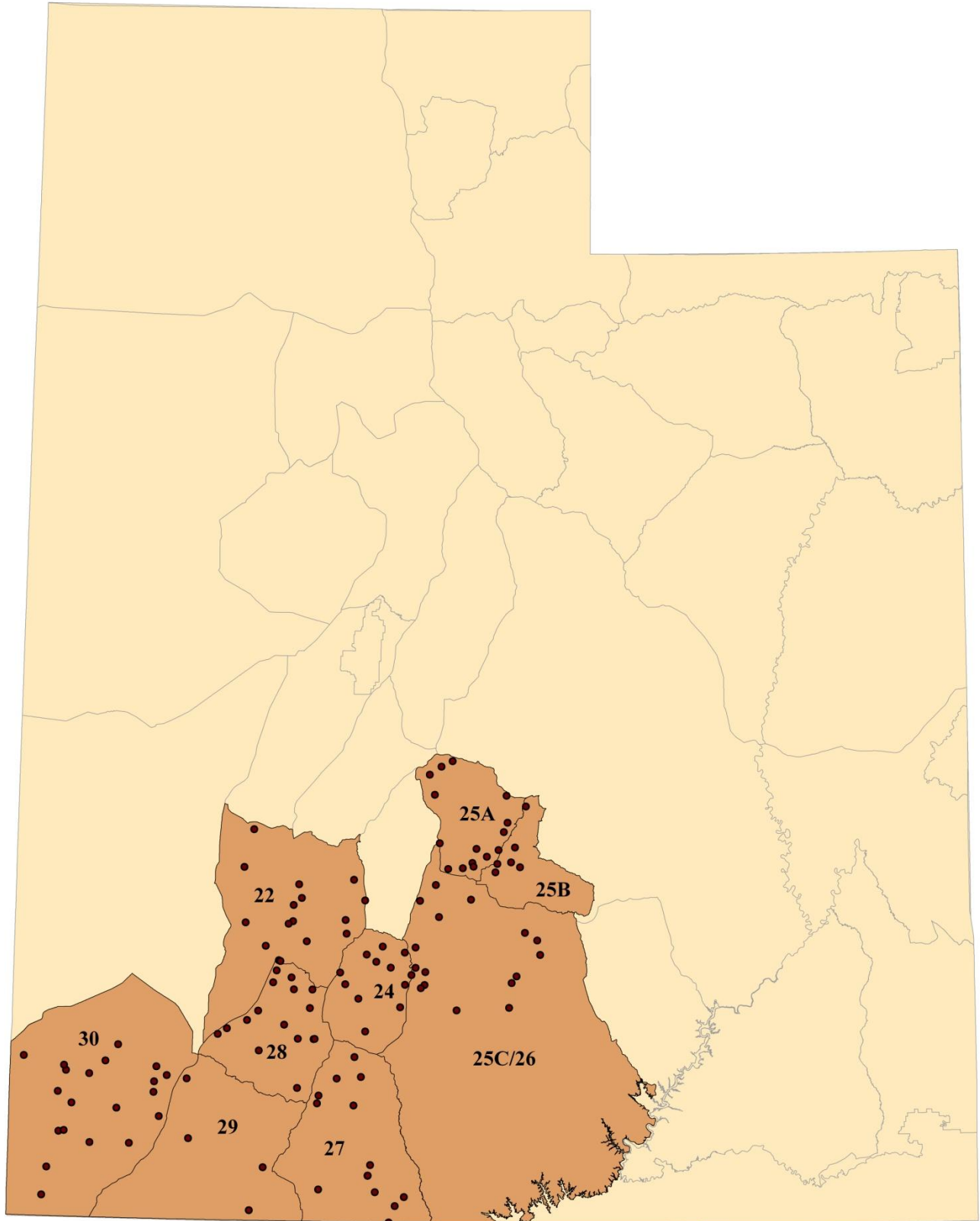
### Fishlake National Forest

- Beaver Ranger District
- Fillmore Ranger District
- Richfield Ranger District

Private landowners were cooperative in allowing access to study sites located on their land.



# Utah Management Units Surveyed 2013



## RANGE TREND STUDY METHODS

Studies monitoring range trend depend greatly on site selection, especially when dealing with large geographic areas such as wildlife management units. Since it is impossible to intensively monitor all vegetation or habitat types within a unit, it is necessary to concentrate on specific sites and/or “key” areas within distinct plant communities on big game ranges. These “key” areas should be places where big game has demonstrated a definite pattern of use during normal climatic conditions over a long period of time. Trend studies are located within these areas of high use and/or crucial habitat as agreed upon by DWR, BLM, and USFS personnel. Often, range trend studies are established in conjunction with permanently marked pellet group transects. Once a “key” area has been selected, specific placement for sampling is determined. The sampling grid is carefully placed in order to adequately represent the surrounding area. All sampling baselines are permanently marked by half-high steel fence posts. The first, or “0 foot baseline stake”, is marked with a metal tag for proper identification of the transect.

### Vegetation Composition

Determining vegetation characteristics for each “key” area is determined by setting up five consecutive 100 foot transects in the area of interest. This 500 foot line is the baseline and one, 100 foot belt is placed perpendicular to each 100 foot section of the baseline at predetermined foot marks and centered on the 50 foot mark of the belt. A rebar stake is placed at the beginning of each belt to ensure that future sampling is in consistent alignment with the originally sampled belt. A 1/4 m<sup>2</sup> quadrat is centered every 5 feet along the same side of the belt, starting at the 5 foot mark. Cover and nested frequency values are determined for vegetation, litter, rock, pavement, cryptogams, and bare ground. Cover and nested frequency values are also estimated for all plant species occurring within a quadrat, including annual species. However, prior to 1992 no data was collected for annual species.

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

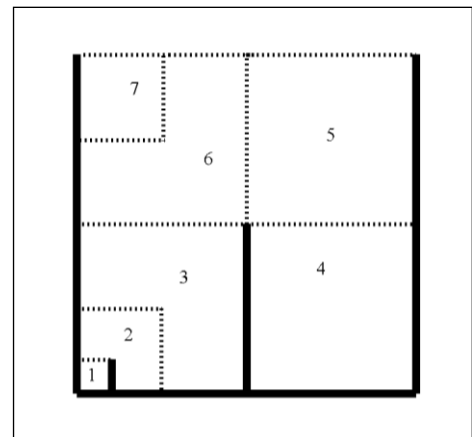


Figure 1. Cover classes of the 1/4 m<sup>2</sup> sampling quadrat.

Total canopy cover of shrubs or trees is also estimated using the line- intercept method (<sup>1</sup>U.S. Department of Interior Bureau of Land Management 1999). The total distance along each belt covered by a particular species of tree or shrub is divided by the total length of the line to give percent canopy cover.

Nested Frequency: Nested frequency values for the quadrat range from 1-5 according to which area or sub-quadrat the plant species or cover type is rooted in. The notation for each sub-quadrat is as follows: 5 = 1% of the area, 4 = 5% of the area, 3 = 25% of the area, 2 = 50% of the area, and 1 = the remainder of the quadrat. Each time a particular plant species or cover type occurs within the quadrat, it is scored relative to which of the

smallest nested quadrats it is rooted in (in the case of vegetation) or where it first occurs (for all other cover types). The highest possible score is 5 for each quadrat occurrence and 100 per belt, for a possible score of 500 for each species or cover type at a given site (Figure 2).

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

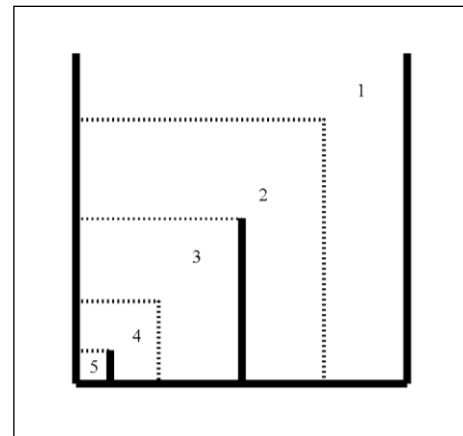


Figure 2. Nested frequency sub-quadrats of the 1/4 m<sup>2</sup> sampling quadrat.

Nested frequency and average percent cover data for individual grass and forb species are summarized in the “Herbaceous Trends” table of each study discussion. Average cover of vegetation, rock, pavement, litter, cryptogams, and bare ground are summarized in the “Basic Cover” table of each study discussion.

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

**Seedling:** Plants up to three years old which have become firmly established, usually less than 1/8-inch diameter.

**Young:** Larger with more complex branching. Does not show signs of maturity. Usually between 1/8 and 1/4-inch diameter.

**Mature:** Complex branching, rounded growth form, larger size, seed is produced on healthy plants. Generally larger than 1/4-inch diameter.

**Decadent:** Plant, regardless of age, that is in a state of decline, usually evidenced by 25% or more dead branches.

**Dead:** A plant which is no longer living.

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

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

\*Lightly hedged: 0 to 40 percent of twigs browsed.

\*Moderately hedged: 41 to 60 percent of twigs browsed.

\*Heavily hedged: Over 60 percent of twigs browsed.

Largely available: One-third to two-thirds of plant available to animal.

Mostly unavailable: Less than one-third of plant available to animal.

Unavailable: In classifying browse to a form class, unavailability may be the result of height, location, or density.

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

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

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

In addition, each mature shrub species closest to every 10 foot mark along a sampling belt is measured to determine average height and crown. This allows a maximum sample of 50 plants per species to be measured at a given site depending on their respective densities. Annual leader growth is estimated for key browse species at each study site. This is done by measuring five leaders on the closest mature shrub in each quarter (similar to point-center quarter method) from 3 stakes along the study site baseline (0', 200' and 400' stakes). These numbers are then averaged.

Point-Center Quadrat Method: Tree density is determined using the point-center quarter method (Mitchell 2007, Dahdouh-Guebas and Koedam 2006, Pollard 1971, Cottam and Curtis 1956) at 100 foot intervals along the baseline measuring to a maximum of 15 meters. If trees are rare due to a treatment or wildfire, the sampling area is extended to 200 foot intervals measuring to a maximum of 30 meters, and 300 feet is added to the end of the transect so that five, 200 foot point-quarter centers can be read. This allows sampling trees on a much larger scale. The strip method that is used to estimate shrub density can, in most cases, effectively inventory seedling and young tree densities. However, the strip method is less effective at estimating densities of mature trees that are often widely disbursed.

Prior to 1992, shrub frequency was determined using the nested frequency method that was previously described. It was found that nested frequency of shrubs did not usually reflect accurate trends in shrub populations which had particularly low or high densities. Therefore, beginning in mid-1992, each 1/100th acre shrub strip is divided into 20, five-foot segments. To give a more accurate measure of shrub frequency, presence or absence of shrub species is determined within these strip segments, and this measurement is termed strip frequency. For example, if a species was rooted in 25 of the 100 shrub strips, strip frequency for this species would be 25%. This data along with shrub cover is recorded in the "Browse Trends" table.

## **Trend Determination**

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

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

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

This index is used primarily to determine if a particular site has the vegetation components necessary to be good winter range for mule deer. It can also be used to identify areas where habitat restoration projects may be needed and assist land managers in determining possible rehabilitation options. Because it does not take into account factors such as soil stability, hydrologic function, and other environmental factors, it should not be used to assess a site's 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 decadence, 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. Based on these criteria, communities are scored in a 100 point scale using the following system:

#### Preferred Browse (60 points)

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

##### Preferred Browse Cover (30 pts. possible)

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

##### Percent Decadence (15 points possible)

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

##### Percent Young (15 points possible)

- 0.5 points for each 1% of young

#### Herbaceous Understory (40 points)

##### Perennial Grass Cover (30 points possible)

- 2 points for each 1% cover

##### Perennial Forb Cover (10 points possible)

- 2 points for each 1% cover

Annual Grass Cover (-20 points possible)

- -0.75 points for each 1% cover

Noxious Weeds (State List)

- -2 points for each species present

The Desirable Components Index ratings are divided into three categories because each community has a different ecological potential. These categories include low potential (Wyoming Big Sagebrush – Cliffrose – Desert shrubs), mid-level potential (Mountain Big Sagebrush) and high potential (Mountain Brush) categories. The three categories are scored based on the above criteria as follows:

Low potential scale (Wyoming Big Sagebrush – Cliffrose – Desert shrubs)

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

Mid-level potential scale (Mountain Big Sagebrush)

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

High potential scale (Mountain Brush)

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

Black sagebrush (*Artemisia nova*) and Basin big sagebrush (*A. tridentata* ssp. *tridentata*) communities are placed within the low potential or mid-level potential scales based on precipitation and elevation.

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

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

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

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

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

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

## **Report Interpretation**

The following tables and partial tables that are taken from study number 22-12 to help illustrate how to interpret the data and some basic comparisons that can be made with the data.

Site Information: The "Disturbance History" table summarizes what type of treatments and/or disturbances that have affected the site over its history. Where available, historic treatments have been listed that have occurred on the site prior to establishment. If applicable, treatment projects that are associated with the Utah Watershed Restoration Initiative (WRI) are referenced by their project number and are hyperlinked to the completion form of that particular project. Finalization dates or the date in which a particular disturbance occurred are listed with reported affected acreage of the respective disturbance. Seed mix tables are also published when a seed mix is made available and are referenced to a particular project by hyperlink to the associated WRI project title page. Additionally, multiple seed mixes are often associated with one particular treatment and are combined to simplify the appearance of the report. The disturbance history for 22-12 indicates that the Milford Flat fire occurred in 2007 and affected 356,665 acres, and in response to the fire, a chaining with two seedings were performed as part of the Milford Flat Fire Rehabilitation and Contracting project. The project is associated with the WRI project #1218 and was completed in the fall of 2007. The Chaining treatment area encompassed 76,454 acres.

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 12

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Fire	Milford Flat		2007	356,665
Chaining	Milford Flat Fire Rehabilitation and Contracting	<a href="#">1218</a>	Fall 2007	76,454
Seeding Before	Milford Flat Fire Rehabilitation and Contracting	<a href="#">1218</a>	Fall 2007	12,917
Seeding After	Milford Flat Fire Rehabilitation and Contracting	<a href="#">1218</a>	Fall 2007	7,100

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 22, Study no: 12

Project Name: Milford BLM Mix 2 WRI Database #: <a href="#">1218</a>				Project Name: Milford BLM Mix 2 Wyoming Sage WRI Database #: <a href="#">1218</a>			
Application: Aerial Seed		Acres	12917	Application: Aerial Seed		Acres	7100
Seed Type		lbs in mix	lbs/acre	Seed Type		lbs in mix	lbs/acre
G	Crested Wheatgrass 'Hycrest'	26500	2.05	F	Alfalfa 'Ladak'	3550	0.50
G	Indian Ricegrass 'Rimrock'	10850	0.84	B	Sagebrush, Wyoming	3550	0.50
G	Intermediate Wheatgrass 'Rush'	10150	0.79	Total Pounds		7100	1.00
G	Pubescent Wheatgrass 'Luna'	16100	1.25	PLS Pounds			0.55
G	Siberian Wheatgrass 'P-27'	1200	0.09				
G	Siberian Wheatgrass 'Vavilov'	1500	0.12				
G	Thickspike Wheatgrass 'Bannock'	16350	1.27				
F	Alfalfa 'Ladak'	7150	0.55				
F	Blue Flax 'Appar'	3600	0.28				
F	Sainfoin 'Eski'	2200	0.17				
F	Small Burnett 'Delar'	19550	1.51				
F	Western Wheatgrass 'Arriba'	20400	1.58				
Total Pounds		135550	10.49				

**Habitat and Vegetation Information:** Summarized within this section is habitat for big game and other species of interest, and further categorizes the habitat into seasonal range and its value description of the habitat for the allied species. The “Vegetation History” table summarizes what major vegetation types have occurred on the site over the duration of the study. Ranges of sample years provide what length of time the dominant vegetation type has persisted on the site with its corresponding species listed in the adjacent cell. Most vegetation types will have one dominant species listed, which is usually a shrub species. For example, some sites will have a shrub canopy that dominates the site with a perennial herbaceous understory that has similar average cover as the canopy, but occurs infrequently. In this case, precedence is given to the shrub layer. Vegetation type can also be shared in the case of co-dominance. Using the example above, if the herbaceous understory had a high nested frequency then the shrub layer would likely share the vegetation type with the perennial understory. The history of pinyon-juniper encroachment is characterized within the table stating the phase(s) of succession for the corresponding years of persistence. Phases of woodland succession may also influence the vegetation type. For example, pinyon-juniper encroachments in phase I are subordinate to the dominant vegetation type and are not considered co-dominant and are therefore not listed within the vegetation type column. Trees in phase II are considered co-dominant with the co-dominant understory counterpart, and under these circumstances tree species is then listed with the understory counterpart within the vegetation type column. The following “Vegetation History” table indicates that Wyoming big sagebrush was the dominant vegetation type on the site from 1985 to 2008, but transitioned to an annual-perennial grass community from 2008 to 2013, and woodland succession has remained in phase I over the sample years. The transition from Wyoming big sagebrush to an annual-perennial grass community that occurred between the 2003 and 2008 sample years indicates that a trigger mechanism has occurred and a threshold has been crossed that lead to the change in community composition, and in this case is related to the Milford Flat fire that occurred in 2007.



VEGETATION HISTORY--

Management unit 22, Study no: 12

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-2003	Wyoming Big Sagebrush	Phase I
2008-2013	Annual-Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Potential:** This section is prefaced by the listing of the average annual precipitation, NRCS taxonomical soil classification (when available), and NRCS ecological site name and number. The ecological site name and numbers are determined by range trend personnel by digging a pit on site to establish the soil characteristics of the site, which is then dichotomized to establish the name of the ecological site name and number.

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

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

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

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

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

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

SOIL ANALYSIS DATA--

Management unit 22, Study no: 12

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Loam	62.7	20.7	16.6	6.7	0.6	1.8	7.5	96.0	1998

State-and Transitions: The state-and-transitions section will be prefaced by whether or not a site has a defined state-and-transitions model proposed for the ecological site. If a model is not proposed, an attempt is made to find a similar ecological site that has a proposed state-and transition model, but is not directly correlated to the site being evaluated. When state-and-transition models are available, an effort is made to summarize the community transitions that have occurred over the duration of the study in conjunction with the referenced state-and-transition diagram provided by the NRCS. This section closely reflects the transitions captured in the “vegetation history” table, but an emphasis is placed on the states and community phases of a particular vegetation type, and what community pathway (mechanism) drove the community phase to its current ecological state. States are identified in the diagram by whole numbers. For example, the reference state is referred to by 1, the current potential state by 2, and subsequent states are labeled 3, 4 and etc. while community phases are nested within a state and are identified by rational numbers. For example, community phases in state 1 would be identified by 1.1, 1.2, 1.3 etc. Transitions are labeled alpha-numerically and are preceded by the letter “T”. This section of the report does not stand alone and care must be taken by the reader to reference the provided state-and-transition model in order to understand the driving factors within the community.

A defined [state and transition model](#) is available for study 22-12. The site was in a Wyoming big sagebrush community defined within Community Phase 2.2. Since the Milford Flat fire, the site has transitioned to Community Phase 6.1 by means of fire and intentional seeding, which is similar to the T3a pathway leading from State 3 to State 6, but a transition is not described leading from State 2 to State 6.

Deer Desirable Components Index: As stated above, this index is used primarily to determine if a particular site has the vegetation components necessary to be considered 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 identifying possible rehabilitation options. In the following DCI table, the site has been ranked “Fair” most sample years, but was ranked “Very Poor” in 2008 following the Milford Flat fire. There are also compositional changes identified within the DCI table. Preferred browse cover decreases considerably in 2008, and is replaced by an increase in perennial grass cover. The table suggests that an increase of preferred browse species with a decrease in annual grass species on the site is necessary in order to improve mule deer habitat. Again, the compositional change is centered on the Milford Flat fire.

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 22, study no: 12

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	21.5	4.3	1.6	14.4	-3.4	1.7	0.0	<b>40.1</b>	Fair
2003	20.0	0.8	0.5	11.0	-3.4	1.0	0.0	<b>29.9</b>	Fair
2008	0.1	0.0	0.0	7.8	-2.3	1.0	0.0	<b>6.6</b>	Very Poor
2013	1.7	0.0	0.0	30.0	-6.0	1.8	0.0	<b>27.6</b>	Fair

Herbaceous Understory: The “Herbaceous Trends” table summarizes the average cover and nested frequency data for individual grass and forb species. The partial table contains most of the grass and forb species that have been sampled on study 22-12. Beginning in 19 July 1992, annual species data was collected, as well as quadrat cover estimates for individual species occurring within the quadrat.

A non-parametric statistical test, the Friedman test (analogous to analysis of variance) (Conover 1980), is conducted on nested frequencies of each species to determine significant changes at alpha = 0.10.

As shown in the “Herbaceous Trends” table, the invasive annual species cheatgrass (*Bromus tectorum*) was the most common species in nested frequency for all sample years, but 1998. The subscript letters indicate that the nested frequency value for *B. tectorum* declined significantly between 2003 and 2008. Cover of *B. tectorum* was estimated at a high of 7.98% in 2013 to a low of 3.15% in 2008. Trend for this grass species has gone up over the duration of the study due to a significant increase in frequency and cover; however, the increase in this species is undesirable for the resilience of the site. Crested wheatgrass (*Agropyron. cristatum*) has increased significantly in nested frequency since 2008. Grasses had a combined total cover value of 11.81% in 1999, 10.02% in 2003, 7.03% in 2008 and 23.13% in 2013. These changes would indicate an upward perennial grass trend following the fire, but is mostly attributed to seeded species crested wheatgrass and intermediate wheatgrass (*Agropyron intermedium*) which were seed following the fire. The forb trend can be determined in a similar manner.

HERBACEOUS TRENDS--

Management unit 22, Study no: 12

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Agropyron cristatum</i>	a-	a-	b84	c138	-	-	1.35	6.47
G	<i>Agropyron dasystachyum</i>	a-	a-	a-	b41	-	-	-	1.43
G	<i>Agropyron intermedium</i>	a-	a-	b109	b113	-	-	1.87	3.75
G	<i>Agropyron spicatum</i>	-	-	-	6	-	-	-	.18
G	<i>Aristida purpurea</i>	b22	b17	a-	a6	.66	.31	-	.03
G	<i>Bromus tectorum</i> (a)	c369	b329	a67	c391	4.59	4.50	3.15	7.98
G	<i>Hilaria jamesii</i>	b71	ab47	a30	ab51	1.18	.31	.26	1.28
G	<i>Oryzopsis hymenoides</i>	a5	a3	ab14	b26	.19	.06	.08	1.00
G	<i>Poa fendleriana</i>	-	-	3	5	-	-	.00	.03
G	<i>Poa secunda</i>	b150	b159	a28	a27	3.09	2.23	.16	.44
G	<i>Sitanion hystrix</i>	b72	b84	a5	a14	1.93	2.40	.06	.05
G	<i>Stipa comata</i>	15	9	7	10	.16	.18	.07	.45
Total for Annual Grasses		369	329	67	391	4.59	4.50	3.15	7.98
Total for Perennial Grasses		335	319	280	437	7.22	5.52	3.88	15.15
Total for Grasses		704	648	347	828	11.81	10.02	7.03	23.13
F	<i>Agoseris glauca</i>	-	4	7	-	-	.01	.06	-
F	<i>Alyssum alyssoides</i> (a)	a-	ab6	ab4	b21	-	.01	.01	.05
F	<i>Arabis demissa</i>	2	-	-	-	.00	-	-	-
F	<i>Astragalus</i> sp.	8	-	1	-	.06	-	.03	-
F	<i>Calochortus nuttallii</i>	1	-	1	-	.00	-	.00	-
F	<i>Castilleja chromosa</i>	3	-	-	-	.03	-	-	-
F	<i>Chenopodium album</i> (a)	-	-	3	-	-	-	.03	-
F	<i>Cryptantha</i> sp.	-	-	-	1	-	-	-	.00
F	<i>Draba</i> sp. (a)	a-	b11	ab4	a-	-	.02	.00	-
F	<i>Erigeron pumilus</i>	11	-	2	-	.59	-	.00	-
F	<i>Erodium cicutarium</i> (a)	a-	a-	a-	b16	-	-	.03	.57
F	<i>Gayophytum ramosissimum</i> (a)	-	-	-	-	-	-	.00	-
F	<i>Gilia</i> sp. (a)	a-	b26	b21	b9	-	.09	1.12	.03

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Helianthus annuus</i> (a)	-	-	5	-	-	-	.18	-
F	<i>Lappula occidentalis</i> (a)	-	-	2	-	-	-	.00	-
F	<i>Linum perenne</i>	-	-	3	-	-	-	.03	-
F	<i>Lomatium</i> sp.	2	-	-	3	.01	-	-	.00
F	<i>Lupinus argenteus</i>	1	-	-	-	.00	-	-	-
F	<i>Medicago sativa</i>	a <sup>-</sup>	a <sup>-</sup>	b <sup>24</sup>	b <sup>17</sup>	-	-	.11	.48
F	<i>Mentzelia</i> sp.	-	-	-	-	-	-	.03	-
F	<i>Microsteris gracilis</i> (a)	1	-	-	-	.00	-	-	-
F	<i>Navarretia intertexta</i> (a)	b <sup>13</sup>	b <sup>28</sup>	b <sup>7</sup>	a <sup>-</sup>	.05	.08	.02	-
F	<i>Onobrychis viciaefolia</i>	-	-	1	-	-	-	.03	-
F	<i>Phlox hoodii</i>	-	-	4	-	-	-	.03	-
F	<i>Phlox longifolia</i>	b <sup>24</sup>	a <sup>9</sup>	a <sup>11</sup>	a <sup>13</sup>	.11	.01	.05	.03
F	<i>Phlox</i> sp.	a <sup>-</sup>	b <sup>94</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.47	-	-
F	<i>Ranunculus testiculatus</i> (a)	-	3	-	-	-	.00	-	-
F	<i>Sanguisorba minor</i>	a <sup>-</sup>	a <sup>-</sup>	b <sup>7</sup>	ab <sup>10</sup>	-	-	.13	.38
F	<i>Sisymbrium altissimum</i> (a)	-	-	-	5	-	-	-	.18
F	<i>Sphaeralcea coccinea</i>	-	-	-	-	.00	-	-	-
Total for Annual Forbs		14	74	46	51	0.05	0.21	1.41	0.84
Total for Perennial Forbs		52	107	61	44	0.84	0.49	0.51	0.91
Total for Forbs		66	181	107	95	0.89	0.71	1.92	1.75

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

Browse: The following “Browse Trends” table summarizes percent average quadrat cover and percent average line intercept cover for all shrub species occurring on this site. All of the shrubs encountered at study number 22-12 are listed. Average quadrat cover is determined using cover classes in conjunction with the 1/4m<sup>2</sup> quadrat to estimate percent quadrat cover. In the 22-12 “Browse Trend” example, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) cover was estimated to be 16.49% in 1998, 14.27% in 2003, 0.00% in 2008 and 0.94% in 2013.

To more accurately estimate canopy cover of trees and shrubs, the line-intercept method is used along each 100 foot belt. In the following example, Wyoming big sagebrush had a cover of 16.78% in 2003 and 0.00% in 2008, and 1.60% in 2013.

The dramatic decrease in cover for browse species during the 2008 sample year is an indicator that something noteworthy occurred on the site and is likely due to a disturbance that occurred between 2003 and 2008, and in this case was related to a Milford Flat fire and subsequent chaining in the fall of 2007.

BROWSE TRENDS--

Management unit 22, Study no: 12

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	16.49	14.27	.00	.94	16.78	-	1.60
B	Chrysothamnus nauseosus	-	-	-	.00	-	-	.45
B	Chrysothamnus viscidiflorus stenophyllus	1.01	1.76	-	-	1.15	-	-
B	Ephedra nevadensis	.74	1.72	-	.44	1.25	-	.75
B	Gutierrezia sarothrae	3.37	3.38	.00	1.09	4.46	-	2.13
B	Juniperus osteosperma	-	-	-	-	.03	-	-
B	Kochia prostrata	-	-	.09	-	-	.06	-
B	Opuntia sp.	-	-	-	-	.13	-	-
B	Pinus edulis	.58	1.56	-	-	.73	-	-
Total for Browse		22.21	22.70	0.10	2.48	24.53	0.06	4.93

The following “Point-Quarter Tree Data” table displays tree density estimates using the point-center quarter method, which better estimates density of widely distributed trees than the shrub density strips. Average basal diameter is also listed in inches. Point-quarter tree data for pinyon estimated 54 trees/acre in 1998, 68 trees/acre in 2003, and less than 18 trees/acre in 2008 and 2013, with average basal diameters of 2.7 inches, 1.7 inches, 0.0 inches, and 0.0 inches, respectively. Once again, the sudden decrease in tree densities and basal diameters of the tree species on this site is indicative of dramatic change that occurred across the landscape and was related to the aforementioned wildfire and chaining.

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 12

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	19	21	<18	<18	4.7	5.7	-	-
Pinus edulis	54	68	<18	<18	2.7	1.7	-	-

The “Browse Characteristics” table summarizes characteristics of the shrub community. Only Wyoming big sagebrush is included in this example. Density is reported for the sagebrush population and is characterized by age class distribution, which is further subdivided into its corresponding age class demographics. Seedlings are excluded from the population estimate due to their susceptibility to seasonal variability that causes large swings in population estimates. The sagebrush population is then characterized by utilization, which is subcategorized by percentages of moderate and heavily hedged plants. Poor vigor and average height crown measurements for mature plants conclude the table. Total density in plants/acre for Wyoming big sagebrush, excluding seedlings, was 3,480 plants/acre in 1998, 3,420 plants/acre in 2003, 40 plants/acre in 2008, and 260 plants/acre in 2013.

BROWSE CHARACTERISTICS--  
Management unit 22, Study no: 12

		Age class distribution				Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis									
98	3480	1	61	37	100	30	2	11	22/34
03	3420	0	48	52	-	18	.58	25	21/34
08	40	100	0	0	60	0	0	0	-/-
13	260	23	77	0	-	8	0	8	16/23

Data for Wyoming big sagebrush from study 22-12 shows the proportion of decadent shrubs in the population increased from 37% in 1998 to 52% in 2003. Few seedlings were encountered over the sample years. The proportion of young plants in the population reached 100% in 2008. However, this number should be viewed in context. With only 40 plants/acre reported (each plant sampled on the site equates to 20 plants/acre), only 2 plants were encountered during the sampling in 2008 and both of which were classified as young. The percentage of plants displaying poor vigor increased from 11% of the population in 1998 to 25% in 2003.

The table again illustrates that a disturbance has influenced the site considerably by reducing sagebrush densities drastically, and has transitioned the sagebrush population from a decadent population displaying poor vigor to a young and mature population that is vigorous. Reestablishment of sagebrush will likely be slow, which is indicated by the lack of seedlings and young within the population. Also important is the lack of utilization occurring on the site. The lack of utilization is good in that stress is removed from the population allowing it to reestablish, but due to the very low sagebrush densities forage availability is scarce for wildlife, and thus the infrequent utilization of the site.

Soil: The “Basic Cover” table summarizes average cover of vegetation, rock, pavement, litter, cryptogams, and bare ground. Vegetation crown cover estimates are projected vertically while the remaining cover types’ cover estimates are a planer projection and when combined will usually exceed 100%. Therefore, comparisons can be made for all cover measurements except for general vegetation cover. Vegetation cover remained similar most sample years, but decreased dramatically in 2008 from 34.36% in 2003 to 9.57% in 2008. Pavement cover remained similar from 1998 to 2003 at 43.72% and 42.49%, respectively. However, pavement increased to 57.20% in 2008. Litter cover was high in 1998 and 2003 at 36.46% and 22.28%, respectively. Litter decreased considerably in 2008 to 5.55%. The “Basic Cover” table illustrates again that a dramatic change took place between the 2003 and 2008 sample years and can be referenced back “Disturbance History” table to the Milford Flat fire in 2007.

BASIC COVER--  
Management unit 22, Study no: 12

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	31.45	34.36	9.57	33.83
Rock	5.43	2.76	6.60	6.56
Pavement	43.72	42.49	57.20	11.92
Litter	36.46	22.28	5.55	40.57
Cryptogams	1.37	.29	0	0
Bare Ground	13.13	8.24	27.41	21.42

**Wildlife Occupancy:** The “Pellet Group Data” table summarizes the frequency of animal pellets sampled within the 100 quadrats placed along the sampling belts as well as data from a pellet group transect read parallel to the study site baseline. Quadrat frequency of rabbit or big game pellets indicates a relative amount of presence by a particular animal. This data can help characterize changes in wildlife occupancy patterns on a site. The example illustrated in the table for study site 22-12 shows that rabbit pellets were found to be similar in 1998 to 2003 at 28% and 21% of the quadrats sampling rabbit pellet groups for their respective years. However, rabbit pellet groups decreased considerably in 2008 to 3%.

The data presented in the “Days Use per Acre: table is reported from the pellet group transect in conjunction with the vegetation transects. The pellet group transect utilizes 50, 100ft<sup>2</sup> circular plots that are placed through the study area. These are usually two parallel transects of 25 plots on each side of the vegetation transect which runs 400 feet to 500 feet in length. The number of recent pellet groups for wildlife (usually deer and elk) and pats for cattle are recorded. That number is then converted to days use per acre (hectare) (Neff 1968). Rabbit pellet groups are not included in this sample. In the example, deer was estimated at 12 days use/acre in 1998, increased to 27 deer days use/acre in 2003, but was absent to nearly absent in 2008 and 2013, respectively. As with the utilization portion of the “Browse Characteristics” table, the “Pellet Groups Data” table demonstrates a significant decrease in wildlife occupancy in 2008 and 2013 and again is likely due to the wildfire removing much of the forage for wildlife.

PELLET GROUP DATA--  
Management unit 22, Study no: 12

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	28	21	3	-	-	-	-	-
Deer	21	9	-	3	12 (30)	27 (66)	-	5 (13)
Cattle	1	2	-	2	6 (15)	4 (11)	-	5 (13)

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

As indicated by many, if not all, of the tables for this study a significant disturbance occurred between the 2003 and 2008 sample years. Study 22-12 was a straight forward illustration of how change can occur on a site at a community level; however, change occurring on some of the studies presented throughout this report will likely have more nuanced compositional changes occurring on a population level rather than a community or landscape level. Combining the numerical and statistical observations found within the tables with the disturbance history, vegetation history, and the site’s state-and-transition model, the reader can produce an accurate picture of the site’s community and population transitions and their causes for each individual study.

**Pre-1992 Data**

Data collected before 19 July 1992 has been excluded from the individual site summaries, due to differences in sampling techniques and changes in sample size and area. This data can be found in the appendix Pre-1992 Data. The following explanations address some of the major changes that occurred with data collection. Nested frequency quadrat divisions and zones were different with four divisions as compared to the five

divisions and zones within the quadrat were different. In addition, nested frequency data for annual species was not collected. Shrub density was collected along a separate transect that was adjacent to the nested frequency transect within three circular plots (radius of 8.3 or 11.7 ft) centered on three permanently marked stakes. Therefore, changes in density (before and after 1992) may not necessarily indicate changes in trend, especially shrub populations that characteristically are clumped and/or have discontinuous distributions. The earlier smaller sample could easily either overestimate or underestimate shrub populations. Other characteristics like percent decadence, percent poor vigor, percent heavy hedging, young recruitment, etc., are given more weight in determining shrub population transitions when comparing survey years where sample sizes were different.



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## REPORT FORMAT

An introductory segment at the beginning of each wildlife management unit categorizes the trend studies that provide references to further information on winter range limits, land ownership patterns, livestock management practices, and management unit objectives.

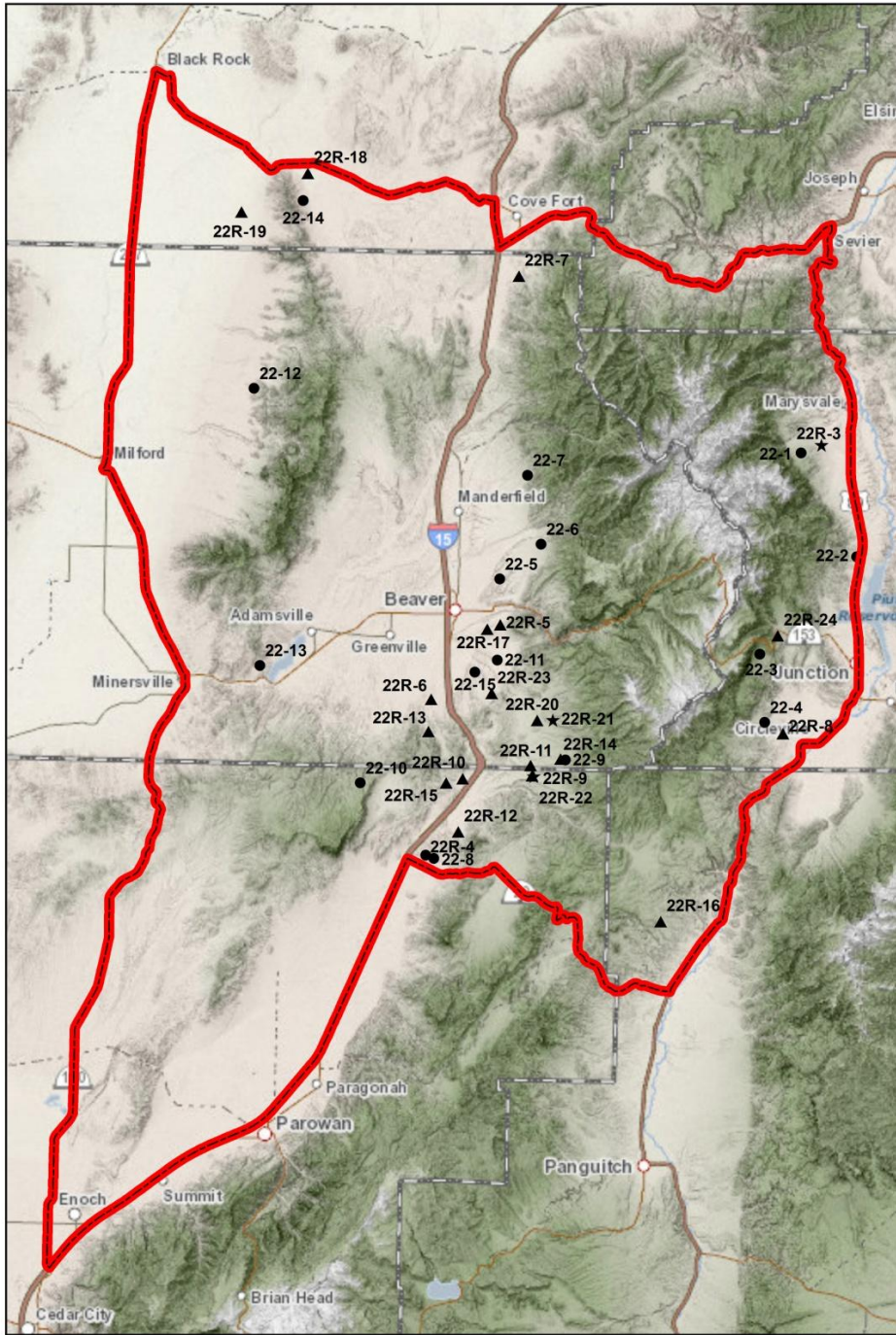
The name and directions for locating a site are given on the location page. A topographical map and diagrammatic sketch are provided to show spacial reference of site location and arrangement. A 7.5 minute topographical map name and public land survey description are located below the map. In addition,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

Discussions of the study site are addressed by several topics that include *Site Information, Habitat and Vegetation Information, Site Notes, Site Potential, and Trend Summary*. Site information contains geographic information such as land ownership, allotment, elevation, aspect, slope, and sample dates. Following the geographic information will be a *Disturbance History* contains all known disturbances that have occurred on the site. Known seed mixes will also listed within the table named *Seed Mix*. Habitat and Vegetation Information section contains wildlife habitat that the site falls within for specific big game and other species of interest. *Vegetation History* follows *Wildlife Habitat* and evaluates any major compositional transitions within the vegetation community. Site notes will discuss any miscellaneous information as it relates to the site and immediate area. Site potential presents a table containing average annual precipitation, NRCS taxonomical soil classification, NRCS ecological site, and NRCS ecological site number. If available, the name of the NRCS ecological site will be hyperlinked to the NRCS' website for additional features concerning ecological site. The table "Soil Analysis Data" presents texture and chemical characteristics found on the site. The *States and Transitions* portion of the section will state if the site has a defined state and transition model available and will be followed by, if available, descriptions of any state or phase transitions that have occurred on the site as it relates to the State-and-Transition diagram modeled by the NRCS. Additional assessment is made by comparing photographs from year to year and can be referred to in the accompanying CD.

The "Trend Summary" contains tables with the Deer Desirable Components Index (DCI) and compiled vegetation data for each site. A computer-generated data summary presents the pooled data for nested frequency, quadrat frequency, basic ground cover, soil characterization, shrub density, and shrub characterization. A nonparametric statistical analysis, the Friedman test, is performed on the nested frequency values between years. This analysis indicates significance levels between species over time at  $\alpha = 0.10$ . Significant changes are indicated in the herbaceous trends table with subscript letters.

Summaries and evaluations for each unit is available in a separate report which addresses range trends in these key areas. This report will serve to identify and verify changes that are occurring on key areas for big game.

# WILDLIFE MANAGEMENT UNIT 22 - BEAVER

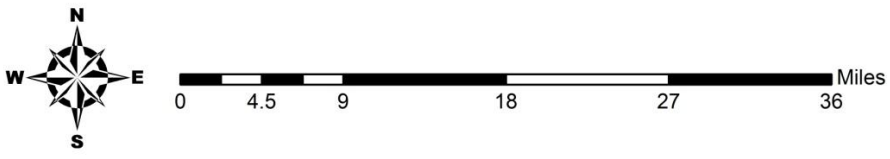
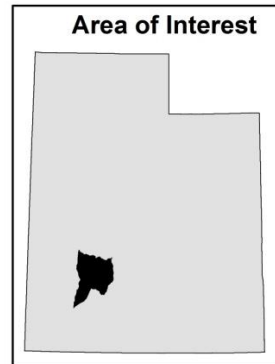


**Unit - 22**

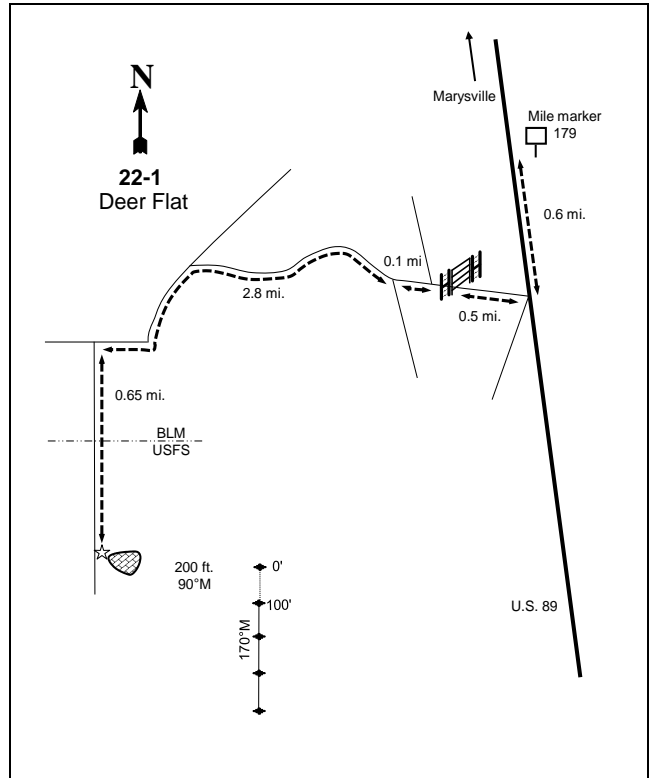
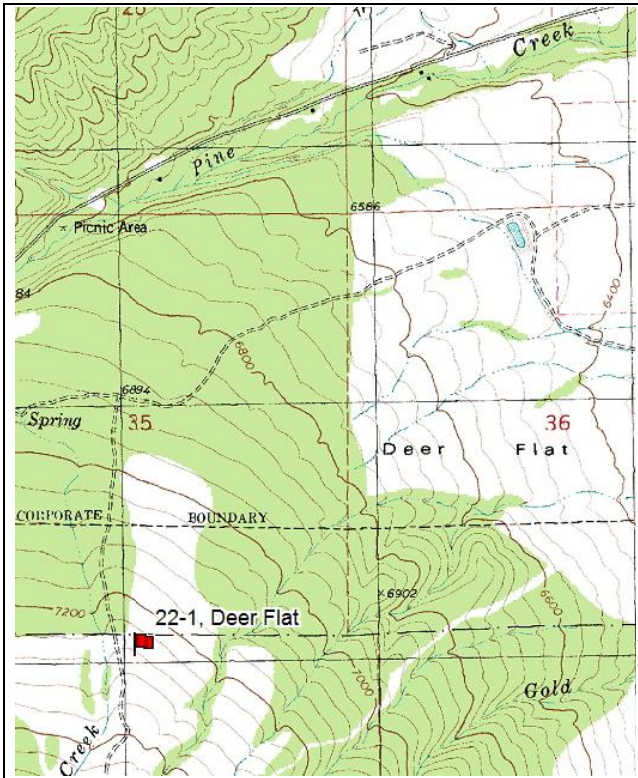
**Study Location**

**Project, Status**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active
- ★ WRI, Suspended



DEER FLAT - TREND STUDY NO. 22-1



**Location Information**

USGS 7.5 min Map Info      Mount Brigham; Township 28S, Range 4W, Section 02  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 387986 East 4252229 North

**Transect Information**

Browse Tag # (0' Stake)      7106  
 Transect Bearing              170° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Belt 1: 1ft, Belt 2: 2ft, Belt 3: 1 ft, Belt 4: 5ft, Belt 5: 4ft

**Directions to Site**

From mile marker 177 south of Marysvale, proceed 0.6 miles and turn right on a dirt road. The road forks immediately beyond a fence stay to the right. Proceed 0.5 miles to another fork in the road at a fence corner. Go straight through the gate, passing a road on each side. Continue 0.1 miles and turn right. Proceed 2.8 miles up this road, following a ditch, passing 2 ponds, and passing through a DWR fence to another fork. Turn left. Go 0.65 miles (through a gate). The 0-foot baseline stake is 200 feet east of the rock. It is a rebar with a browse tag #7106 attached.

**Site Information**

Land Ownership USFS  
 Allotment Marysvale  
 Elevation 7,260ft (2,213m)  
 Aspect North  
 Slope 15%  
 Sample Dates 07/23/1985, 07/10/1991, 07/06/1998, 06/27/2003, 06/10/2008, 05/30/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 1

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1968	-
Seeding	-	-	1968	-

The table is a recorded disturbance history for the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 1

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2003	Mountain Big Sagebrush	Phase I
2008-2013	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Some hybridization of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and black sagebrush (*A. nova*) is likely. Sagebrush was classified based on color, growth form, leaf size, and seed-head formation. Photos show pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees have increased in size since 1985. Water is available in Pine Creek, located about a half mile to the north.

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical Soil Classification Not available  
 NRCS Ecological Site Mountain Stony Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB462UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 1

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	52.0	27.4	20.6	6.2	1.0	6.5	12.1	233.6	1998

Soil normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Stony Loam \(Mountain Big Sagebrush\), R047XA461UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1985, the site was a mixed stand of mountain big sagebrush and black sagebrush with a diverse component of other shrub species present that provided limited cover. Introduced perennial grass

species made up the majority of the herbaceous understory with a moderate number of native forb species and few annual grass species present (Appendix - Pre-1992). Young pinyon and juniper trees had reestablished on the site following the chaining and seeding treatment done in 1968, but provided limited cover. Since study establishment, the shrub and herbaceous components have remained in a stable state with mountain big sagebrush and black sagebrush maintaining dominance throughout the study years, though sagebrush cover has decreased in correlation with increased cover of pinyon and juniper trees. Pinyon and juniper trees have increased in size and cover on the site; though density has remained relatively stable (Table - Browse Trends, Table - Point Quarter Tree Data). This site appears to be in transition to a pinyon and juniper dominated state. Without a disturbance such as fire or mechanical treatment, it is predicted that pinyon and juniper trees will continue to encroach on the site and begin to have a further detrimental effect on the shrub and herbaceous component (USDA-NRCS, 2011).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 22, study no: 1

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	10.0	6.8	28.1	-0.4	3.6	0.0	<b>78.1</b>	Good-Excellent
2003	28.9	2.1	0.9	13.9	0.0	1.9	0.0	<b>47.6</b>	Poor
2008	25.6	2.3	5.7	24.3	0.0	5.5	0.0	<b>63.3</b>	Fair-Good
2013	20.2	11.4	9.4	20.2	-0.4	1.5	0.0	<b>62.5</b>	Fair

### HERBACEOUS TRENDS--

Management unit 22, Study no: 1

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	125	130	112	125	5.05	3.38	3.14	3.23
G	Agropyron intermedium	a-	a-	c33	b22	-	-	2.03	.42
G	Agropyron spicatum	b16	ab3	a-	a-	.42	.04	-	-
G	Bouteloua gracilis	11	13	26	10	.07	.20	.45	.33
G	Bromus inermis	a47	ab53	c112	b81	1.92	1.52	3.14	1.60
G	Bromus tectorum (a)	b38	a16	a5	ab26	.56	.06	.01	.47
G	Carex sp.	b23	a1	a-	ab17	.14	.00	-	.17
G	Koeleria cristata	b63	a11	a23	a17	1.04	.05	.21	.16
G	Oryzopsis hymenoides	a-	ab3	b14	ab1	-	.03	.10	.00
G	Poa fendleriana	a124	a72	a75	b164	3.30	.93	2.45	3.62
G	Poa secunda	b49	a3	b34	ab22	1.69	.03	.23	.31
G	Sitanion hystrix	ab23	b38	a21	a7	.20	.62	.28	.18
G	Stipa comata	7	9	5	11	.19	.11	.06	.07
Total for Annual Grasses		38	16	5	26	0.56	0.06	0.01	0.47
Total for Perennial Grasses		488	336	455	477	14.05	6.94	12.13	10.12
Total for Grasses		526	352	460	503	14.61	7.00	12.15	10.60
F	Agoseris glauca	a6	a3	c89	b41	.04	.01	.58	.11
F	Allium sp.	-	-	-	5	-	-	-	.01
F	Alyssum alyssoides (a)	-	2	-	3	-	.00	-	.01
F	Antennaria sp.	3	-	3	3	.03	-	.00	.03
F	Arabis demissa	1	-	2	-	.03	-	.00	-

T y P e	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Astragalus sp.	b9	a-	a-	a-	.08	-	-	-
F	Astragalus utahensis	2	1	3	9	.00	.00	.03	.07
F	Calochortus nuttallii	a-	ab8	b35	ab1	-	.01	.22	.00
F	Camelina microcarpa (a)	1	-	-	-	.00	-	-	-
F	Castilleja chromosa	1	-	12	-	.00	-	.19	-
F	Collinsia parviflora (a)	-	7	4	-	-	.01	.01	-
F	Crepis acuminata	-	-	2	-	-	-	.03	-
F	Cryptantha sp.	a-	a-	a-	b13	-	-	-	.10
F	Delphinium nuttallianum	-	-	3	-	-	-	.03	-
F	Descurainia pinnata (a)	-	8	11	5	-	.04	.02	.03
F	Erigeron pumilus	6	4	-	-	.06	.03	-	-
F	Eriogonum racemosum	32	26	14	15	.25	.39	.08	.04
F	Eriogonum umbellatum	-	3	1	-	-	.03	.00	-
F	Hymenopappus filifolius	-	-	-	2	-	-	-	.00
F	Hymenoxys acaulis	-	-	5	-	-	-	.06	-
F	Lappula occidentalis (a)	a-	d104	c60	b30	-	.92	.18	.08
F	Lesquerella intermedia	1	4	-	-	.00	.03	-	-
F	Lithospermum ruderales	a3	a2	b15	ab3	.30	.15	.20	.15
F	Lomatium sp.	a-	ab7	bc28	c24	.00	.01	.21	.05
F	Machaeranthera canescens	-	-	-	-	.01	-	-	-
F	Microsteris gracilis (a)	2	11	8	6	.00	.02	.01	.01
F	Orobanche fasciculata	7	-	-	-	.04	-	-	-
F	Petradoria pumila	b16	ab9	ab2	a-	.66	.10	.03	-
F	Phlox longifolia	a57	b27	b31	b26	.23	.13	.23	.05
F	Polygonum douglasii (a)	bc15	ab6	b12	a-	.04	.01	.03	-
F	Sphaeralcea coccinea	3	-	-	-	.03	-	-	-
F	Tragopogon dubius (a)	-	-	-	1	-	-	-	.00
F	Trifolium sp.	a14	a10	b35	ab25	.03	.05	.80	.12
Total for Annual Forbs		18	138	95	45	0.05	1.02	0.25	0.14
Total for Perennial Forbs		161	104	280	167	1.82	0.96	2.73	0.76
Total for Forbs		179	242	375	212	1.88	1.99	2.98	0.90

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

#### BROWSE TRENDS--

Management unit 22, Study no: 1

T y P e	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	8.77	6.34	5.58	2.99	6.40	5.40	4.66
B	Artemisia tridentata vaseyana	18.67	15.26	12.77	10.57	12.98	15.85	15.88
B	Cercocarpus ledifolius	.06	-	.04	.03	-	.01	-
B	Cercocarpus montanus	.38	.33	.56	.33	.51	.15	.18
B	Chrysothamnus depressus	.01	.03	-	.18	.06	-	.13
B	Chrysothamnus parryi	-	-	.06	-	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	-	-	-	-	-	-	.06
B	Eriogonum microthecum	.73	.23	.45	.09	.26	.03	.05



Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Gutierrezia sarothrae	.03	.15	.04	-	-	.08	-
B	Juniperus osteosperma	-	1.26	.66	.53	2.40	.25	-
B	Opuntia sp.	.41	.43	.58	.61	.45	.10	.16
B	Pediocactus simpsonii	-	-	.00	-	-	-	-
B	Pinus edulis	2.64	2.34	6.52	8.19	4.43	9.66	13.55
B	Purshia tridentata	.00	-	-	-	-	-	-
B	Quercus gambelii	1.80	1.08	1.15	2.42	6.71	2.25	2.65
B	Sclerocactus sp.	.01	-	-	-	-	-	-
B	Tetradymia canescens	-	.00	.03	-	-	-	-
Total for Browse		33.52	27.48	28.46	25.96	34.2	33.78	37.32

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 1

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	13	22	22	23	3.8	4.7	6.1	3.4
Pinus edulis	39	55	54	50	4.2	4.3	5.7	4.6

BASIC COVER--

Management unit 22, Study no: 1

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	42.20	36.33	43.91	39.45
Rock	15.98	17.59	14.94	16.98
Pavement	9.25	5.68	5.60	3.24
Litter	50.24	40.18	42.64	53.53
Cryptogams	.58	.18	.32	.40
Bare Ground	12.41	14.11	14.40	13.61

PELLET GROUP DATA--

Management unit 22, Study no: 1

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	37	13	38	10	-	-	-	-
Elk	5	8	4	5	12 (30)	39 (96)	5 (12)	13 (31)
Deer	55	31	51	29	58 (143)	149 (369)	38 (94)	60 (147)
Cattle	7	2	3	6	11 (27)	8 (20)	20 (50)	5 (13)

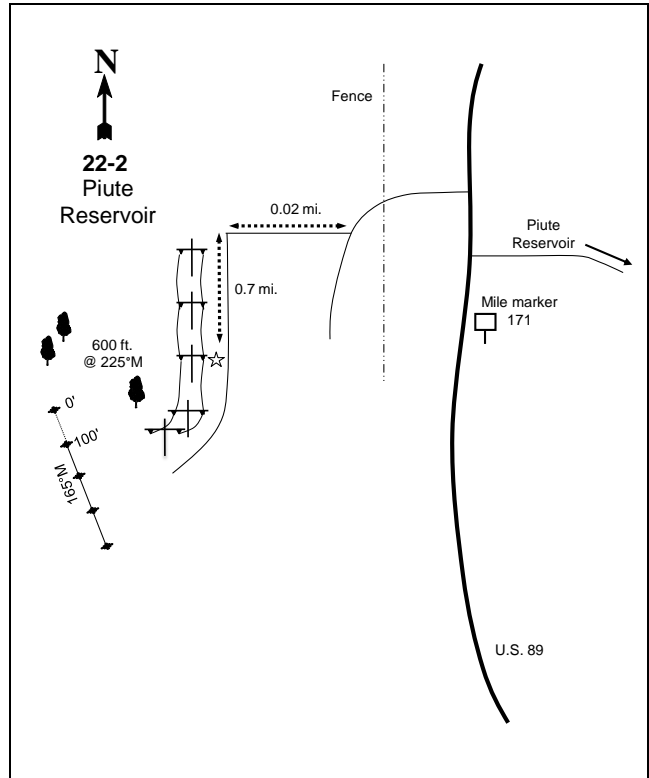
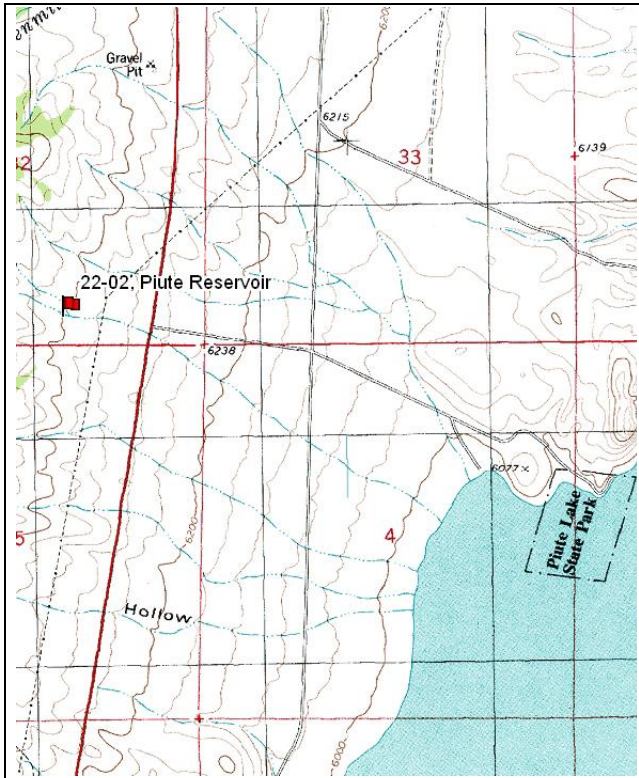
BROWSE CHARACTERISTICS--

Management unit 22, Study no: 1

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Artemisia nova</b>									
98	<b>3920</b>	13	71	16	20	17	1	2	15/23
03	<b>3520</b>	1	49	50	-	7	3	4	16/20
08	<b>3100</b>	15	37	48	340	48	0	14	11/20
13	<b>1660</b>	14	69	17	20	37	0	22	11/24
<b>Artemisia tridentata vaseyana</b>									
98	<b>3640</b>	13	68	19	-	39	6	1	22/32
03	<b>3480</b>	1	55	45	-	32	52	9	25/29
08	<b>2920</b>	8	47	45	120	35	.68	23	23/32
13	<b>2660</b>	7	79	14	40	46	.75	12	24/35
<b>Cercocarpus ledifolius</b>									
98	<b>120</b>	83	17	0	-	0	0	0	16/16
03	<b>40</b>	0	100	0	-	0	100	0	11/13
08	<b>80</b>	75	0	25	20	0	0	0	13/13
13	<b>40</b>	50	50	0	-	0	50	0	13/17
<b>Cercocarpus montanus</b>									
98	<b>380</b>	68	32	0	60	32	5	0	18/18
03	<b>480</b>	0	100	0	-	8	75	0	14/14
08	<b>320</b>	25	63	13	-	25	31	0	12/18
13	<b>300</b>	53	47	0	-	13	47	0	14/17
<b>Chrysothamnus depressus</b>									
98	<b>120</b>	50	50	0	-	17	0	0	2/8
03	<b>280</b>	0	93	7	-	14	86	0	6/8
08	<b>160</b>	13	75	13	-	25	25	0	3/9
13	<b>120</b>	0	100	0	-	17	0	0	3/8
<b>Chrysothamnus parryi</b>									
98	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>40</b>	0	100	0	-	0	0	0	13/18
08	<b>60</b>	0	33	67	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
98	<b>20</b>	0	100	-	-	0	0	0	11/13
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>80</b>	0	100	-	-	0	0	0	7/13
13	<b>100</b>	40	60	-	-	0	0	0	8/11
<b>Eriogonum microthecum</b>									
98	<b>400</b>	5	90	5	-	10	0	5	6/12
03	<b>680</b>	6	94	0	-	24	35	0	5/6
08	<b>480</b>	17	75	8	-	8	8	0	6/7
13	<b>140</b>	14	86	0	-	29	0	0	4/4

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Gutierrezia sarothrae</b>									
98	20	0	100	-	-	0	0	0	7/5
03	40	50	50	-	-	0	0	0	6/6
08	60	33	67	-	20	0	0	0	6/8
13	20	100	0	-	-	0	0	0	6/6
<b>Juniperus osteosperma</b>									
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	21/22
<b>Opuntia sp.</b>									
98	720	25	69	6	40	0	0	6	5/10
03	820	0	85	15	-	0	7	5	5/10
08	860	16	72	12	-	0	0	7	4/11
13	580	0	79	21	20	3	0	21	4/10
<b>Pediocactus simpsonii</b>									
98	40	0	0	-	-	0	0	0	-/-
03	100	40	60	-	-	0	0	0	2/4
08	0	0	0	-	-	0	0	0	1/3
13	60	0	100	-	-	0	0	0	2/3
<b>Pinus edulis</b>									
98	100	0	100	-	-	0	0	0	-/-
03	60	0	100	-	-	0	0	0	-/-
08	160	13	88	-	-	0	0	13	-/-
13	160	25	75	-	-	0	0	0	129/137
<b>Quercus gambelii</b>									
98	540	19	78	4	-	7	26	4	31/28
03	1040	19	81	0	-	63	17	0	19/16
08	480	21	67	13	-	33	0	0	29/21
13	1140	72	28	0	-	25	0	0	27/18
<b>Sclerocactus sp.</b>									
98	40	50	50	-	20	0	0	0	2/3
03	0	0	0	-	-	0	0	0	-/-
08	40	0	100	-	-	0	0	0	3/5
13	20	0	100	-	-	0	0	0	7/7
<b>Tetradymia canescens</b>									
98	0	0	0	0	-	0	0	0	-/-
03	40	50	50	0	-	0	0	0	6/10
08	40	50	0	50	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-

PIUTE RESERVOIR - TREND STUDY NO. 22-2



**Location Information**

USGS 7.5 min Map Info Piute Reservoir; Township 28S, Range 3W, Section 32  
 GPS (0' Stake) NAD 83, UTM Zone 12, 393072 East 4242736 North

**Transect Information**

Browse Tag # (0' Stake) 7080  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

From mile marker 171 on US 89 north of Junction, go 0.3 miles north and turn west (left) on a dirt road. Take an immediate right after going through the fence. Proceed 0.2 miles to a fork; go left for 0.7 miles to a large steel power pole where the power lines turn. From the steel power pole, go about 600 feet at 225 degrees magnetic between two large juniper trees to another juniper. The 0-foot end of the frequency baseline is 5 yards south of the juniper. The stakes are all rebar and the 0-foot stake has a browse tag #7080 attached.

**Site Information**

Land Ownership SITLA  
 Allotment Junction  
 Elevation 6,400ft (1,951m)  
 Aspect Northeast  
 Slope 2-3%  
 Sample Dates 07/30/1985, 07/09/1991, 07/13/1998, 07/07/2003, 06/10/2008, 05/30/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

## VEGETATION HISTORY--

Management unit 22, Study no: 2

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A few deer shed antlers have been found on the site at time of sampling, one in 1991 and five in 1998.

**Site Potential**

1981-2010 Average Annual Precipitation 9 inches  
 NRCS Taxonomical Soil Classification Not available  
 NRCS Ecological Site Semidesert Shallow Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY243UT

## SOIL ANALYSIS DATA--

Management unit 22, Study no: 2

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	68.0	17.4	14.6	7.3	0.7	0.9	3.1	131.2	1998

Soil normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since the establishment of the study site in 1985, the shrub and herbaceous components have remained in a stable state with a dominant shrub layer of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and a sparse herbaceous understory (Appendix B -Pre-1992 Data) (Table - Herbaceous Trends, Browse Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 22, study no: 2

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	23.0	6.3	7.0	3.3	0.0	0.6	0.0	<b>40.2</b>	Fair
2003	27.1	3.0	0.5	0.9	0.0	4.0	0.0	<b>35.5</b>	Fair
2008	25.8	1.5	1.5	1.0	0.0	0.3	0.0	<b>30.0</b>	Fair
2013	23.9	10.2	3.0	3.2	0.0	0.2	0.0	<b>40.5</b>	Fair

## HERBACEOUS TRENDS--

Management unit 22, Study no: 2

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Bromus tectorum (a)	3	6	8	12	.00	.03	.02	.03
G	Carex sp.	1	-	-	-	.00	-	-	-
G	Oryzopsis hymenoides	12	12	6	10	.28	.22	.07	.16
G	Sitanion hystrix	ab40	a16	a31	b63	.71	.16	.34	1.35
G	Stipa comata	27	18	6	12	.65	.07	.07	.10
Total for Annual Grasses		3	6	8	12	0.00	0.03	0.02	0.03
Total for Perennial Grasses		80	46	43	85	1.65	0.47	0.48	1.61
Total for Grasses		83	52	51	97	1.66	0.50	0.50	1.64
F	Allium sp.	-	3	-	-	-	.00	-	-
F	Alyssum alyssoides (a)	-	3	4	-	-	.00	.00	-
F	Amsinckia sp.	a-	b85	a-	a-	-	1.93	-	-
F	Astragalus lentiginosus	b15	a-	ab3	ab7	.23	-	.01	.01
F	Castilleja linariaefolia	-	3	-	2	-	.03	-	.03
F	Chaenactis douglasii	1	3	-	-	.00	.00	-	-
F	Collomia linearis (a)	a-	b15	a-	a-	-	.04	-	-
F	Cryptantha sp.	6	-	-	2	.06	-	-	.03
F	Descurainia pinnata (a)	a-	b57	a-	a-	-	.41	-	-
F	Draba sp. (a)	-	1	-	-	-	.00	-	-
F	Eriogonum cernuum (a)	6	1	-	-	.01	.00	-	-
F	Gilia sp. (a)	a-	c61	b17	a-	-	.21	.03	-
F	Mentzelia albicaulis (a)	-	7	-	-	-	.01	-	-
F	Orobancha fasciculata	1	-	-	-	.00	-	-	-
F	Phlox longifolia	3	6	5	4	.00	.01	.15	.01
F	Sphaeralcea grossulariifolia	-	1	-	1	-	.00	-	.03
Total for Annual Forbs		6	145	21	0	0.01	0.70	0.03	0
Total for Perennial Forbs		26	101	8	16	0.30	1.99	0.16	0.12
Total for Forbs		32	246	29	16	0.31	2.69	0.20	0.12

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

BROWSE TRENDS--

Management unit 22, Study no: 2

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	18.43	21.66	20.62	19.08	17.56	17.20	19.90
B	Chrysothamnus viscidiflorus stenophyllus	7.56	5.90	3.94	4.56	6.26	4.14	8.11
B	Gutierrezia sarothrae	-	-	-	.01	-	-	-
B	Juniperus osteosperma	-	.03	-	.00	-	-	-
B	Leptodactylon pungens	.38	-	-	-	-	-	-
B	Opuntia sp.	.15	-	.03	-	-	-	-
B	Pinus edulis	.18	.41	.81	1.38	.88	.80	1.01
Total for Browse		26.70	28.00	25.41	25.04	24.70	22.14	29.02

BASIC COVER--

Management unit 22, Study no: 2

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	29.79	30.15	26.92	24.82
Rock	3.83	6.93	2.89	4.48
Pavement	43.54	31.50	49.43	39.85
Litter	26.40	17.25	22.37	26.75
Cryptogams	.15	.15	.35	.18
Bare Ground	21.89	27.26	14.53	19.27

PELLET GROUP DATA--

Management unit 22, Study no: 2

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	11	10	74	28	-	-	-	-
Elk	-	2	-	-	-	-	5 (13)	-
Deer	6	1	2	3	21 (52)	3 (8)	3 (7)	8 (20)

BROWSE CHARACTERISTICS--

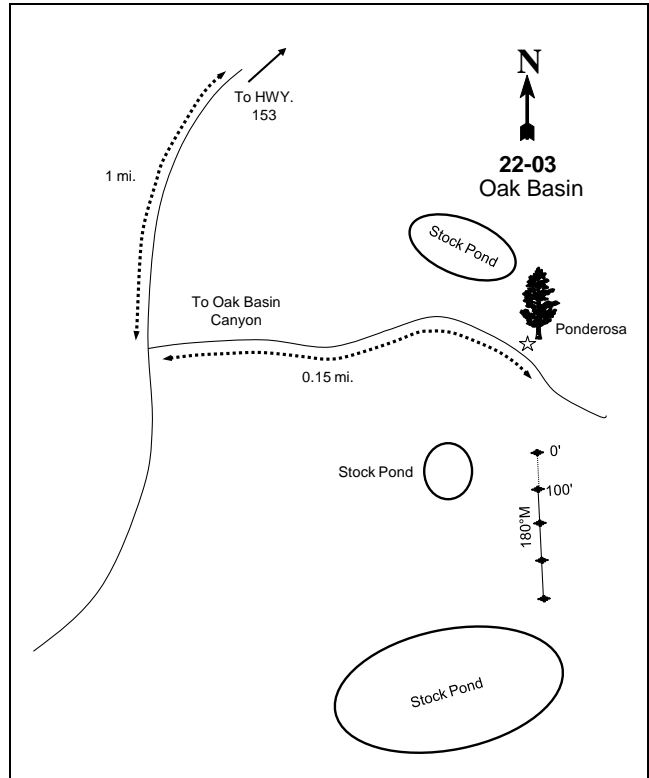
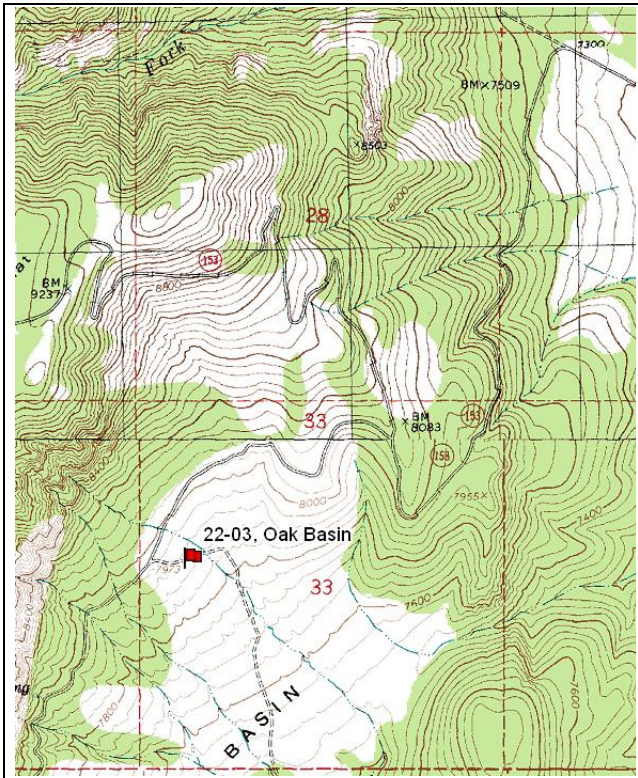
Management unit 22, Study no: 2

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Amelanchier utahensis									
98	20	0	0	100	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
98	3560	14	57	29	140	44	4	15	20/33	
03	4660	1	59	40	-	8	.42	5	20/29	
08	4080	3	52	45	-	44	24	17	19/32	
13	3600	6	79	16	40	23	12	25	20/33	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
98	3400	7	78	15	260	0	2	5	12/13	
03	3920	2	62	37	-	0	0	1	12/15	
08	4280	3	66	31	20	21	7	4	8/11	
13	3760	7	90	2	100	0	0	1	11/17	
<i>Gutierrezia sarothrae</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	260	31	69	-	-	0	0	0	5/5	
<i>Juniperus osteosperma</i>										
98	0	0	0	-	20	0	0	0	-/-	
03	20	100	0	-	-	0	0	0	-/-	
08	20	100	0	-	-	0	0	100	-/-	
13	20	100	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	20	0	100	0	-	0	0	0	-/-	
03	20	0	100	0	-	0	0	0	5/5	
08	20	0	0	100	-	0	0	0	-/-	
13	0	0	0	0	-	0	0	0	-/-	
<i>Pinus edulis</i>										
98	40	50	50	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	-/-	
08	40	50	50	-	-	0	0	0	-/-	
13	40	0	100	-	-	0	0	0	-/-	



OAK BASIN - TREND STUDY NO. 22-3



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Circleville; Township 29S, Range 4W, Section 33  
NAD 83, UTM Zone 12, 384193 East 4233814 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

7044  
180° magnetic  
400ft  
Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Belt 2: 3ft, Belt 5: 7ft

**Directions to Site**

From the center of Junction in Piute County, go west on Highway 153 for 7.6 miles. Take the left fork (Oak Basin Cottonwood Rd or Rd 134) and go about 1 mile to another fork. Turn left and go 0.15 miles to a lone ponderosa pine 15 feet to the left of the road. The baseline starts 100 feet south of the ponderosa pine. The 0-foot stake is a steel rebar tagged #7044.

## Site Information

Land Ownership USFS  
Allotment Circleville  
Elevation 7,900ft (2,408m)  
Aspect Southeast  
Slope 15-20%  
Sample Dates 07/30/1985, 07/10/1991, 07/02/1998, 07/07/2003, 06/25/2008, 05/30/2013

## DISTURBANCE HISTORY--

Management unit 22, Study no: 3

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Harrow (Dixie)	-	-	1965	600
Seeding	-	-	1965	600
Fire	-	-	1985-1990	-

The table is a recorded disturbance history of the study site.

## Habitat and Vegetation Information

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer, Calving

## VEGETATION HISTORY--

Management unit 22, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985	Mountain Big Sagebrush	Phase I
1991-2013	Perennial Grass/Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

## Site Notes

Historic pellet group data from 1976-1997 is available from the Oak Basin pellet group transect that is located 200-300 feet higher in elevation and about a half mile to the north of the study site (Jense, et al., 1985; Jense, et al., 1991; Evans, et al., 1997).

## Site Potential

1981-2010 Average Annual Precipitation 22 inches  
NRCS Taxonomical Soil Classification Not available  
NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
NRCS Ecological Site # R047XB430UT

## SOIL ANALYSIS DATA--

Management unit 22, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	70.0	9.4	20.6	6.3	0.9	3.9	16.2	332.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

## States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1985, the site was a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and Gambel oak (*Quercus gambelii*) with introduced perennial grass species being the major component of the herbaceous understory (Appendix - Pre-1992). The site transitioned to a seeded perennial

grass and mountain big sagebrush state following the fire that occurred prior to the 1991 sampling. Without disturbance and with proper grazing management, it is predicted that a co-dominance of sagebrush and herbaceous understory can be maintained on the site (USDA-NRCS, 2011).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 22, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	5.4	0.0	0.0	30.0	0.0	10.0	0.0	<b>45.4</b>	Poor
2003	7.0	8.8	4.0	30.0	0.0	5.0	0.0	<b>54.8</b>	Fair
2008	10.2	11.7	10.7	30.0	0.0	5.8	0.0	<b>68.4</b>	Good
2013	13.9	14.0	15.0	30.0	-0.1	6.9	0.0	<b>79.7</b>	Good-Excellent

HERBACEOUS TRENDS--  
Management unit 22, Study no: 3

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	c194	b106	b140	a28	4.73	2.94	2.56	.30
G	Agropyron intermedium	b397	ab384	a366	ab390	20.24	15.74	12.60	13.99
G	Agropyron spicatum	-	3	-	-	-	.00	-	-
G	Bouteloua gracilis	1	9	3	4	.03	.44	.38	.18
G	Bromus inermis	15	5	19	20	.16	.07	.26	.45
G	Bromus tectorum (a)	a-	a-	ab5	b23	-	-	.01	.18
G	Carex sp.	b26	a1	b50	c57	.55	.03	.69	1.44
G	Dactylis glomerata	-	-	-	3	-	-	-	.03
G	Koeleria cristata	-	4	-	2	-	.03	-	.00
G	Oryzopsis hymenoides	3	-	1	7	.00	-	.00	.02
G	Poa fendleriana	a28	a45	b62	a24	.33	.41	.77	.30
G	Poa pratensis	ab3	ab5	a-	b13	.00	.03	-	.17
G	Poa secunda	-	2	-	4	-	.00	-	.01
G	Sitanion hystrix	2	-	-	4	.00	-	-	.06
G	Stipa comata	-	1	4	3	-	.00	.01	.03
G	Stipa lettermani	b27	ab8	ab4	a-	.46	.21	.03	-
Total for Annual Grasses		0	0	5	23	0	0	0.01	0.18
Total for Perennial Grasses		696	573	649	559	26.53	19.93	17.32	16.99
Total for Grasses		696	573	654	582	26.53	19.93	17.33	17.17
F	Agoseris glauca	ab10	a-	ab8	b28	.01	-	.02	.37
F	Arabis sp.	a-	ab1	a-	b22	-	.03	-	.07
F	Astragalus convallarius	a-	ab7	ab1	b9	-	.02	.01	.09
F	Astragalus newberryi	6	3	7	10	.16	.06	.02	.12
F	Calochortus nuttallii	3	-	1	2	.00	-	.00	.00
F	Chenopodium album (a)	-	-	-	2	-	-	-	.04
F	Cirsium sp.	-	-	3	3	-	-	.00	.03
F	Collinsia parviflora (a)	a-	a-	a-	b15	-	-	-	.07

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Cryptantha sp.	-	2	4	-	-	.00	.00	-
F	Eriogonum racemosum	2	1	4	4	.03	.00	.06	.04
F	Gayophytum ramosissimum(a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>8</sup>	c <sup>24</sup>	-	-	.02	.06
F	Hackelia patens	2	-	-	-	.00	-	-	-
F	Lactuca serriola (a)	4	-	-	-	.01	-	-	-
F	Lappula occidentalis (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>41</sup>	-	-	-	.42
F	Lithospermum ruderales	-	5	-	-	-	.00	-	-
F	Lomatium sp.	a <sup>-</sup>	a <sup>-</sup>	ab <sup>2</sup>	b <sup>18</sup>	-	-	.03	.10
F	Lotus utahensis	-	-	1	-	-	-	.03	-
F	Lupinus argenteus	b <sup>73</sup>	a <sup>30</sup>	a <sup>36</sup>	ab <sup>54</sup>	7.11	2.34	2.62	1.88
F	Medicago sativa	4	3	-	1	.06	.00	-	.00
F	Microsteris gracilis (a)	a <sup>-</sup>	b <sup>22</sup>	ab <sup>2</sup>	c <sup>239</sup>	-	.14	.00	.70
F	Orobancha sp.	-	-	1	-	-	-	.00	-
F	Phlox longifolia	a <sup>3</sup>	a <sup>4</sup>	a <sup>3</sup>	b <sup>20</sup>	.01	.00	.01	.13
F	Polygonum douglasii (a)	b <sup>50</sup>	a <sup>-</sup>	ab <sup>23</sup>	ab <sup>22</sup>	.16	-	.06	.04
F	Ranunculus testiculatus (a)	a <sup>-</sup>	a <sup>-</sup>	ab <sup>2</sup>	b <sup>15</sup>	-	-	.00	.03
F	Senecio multilobatus	-	-	-	3	-	-	-	.03
F	Taraxacum officinale	-	-	-	1	-	-	-	.00
F	Tragopogon dubius (a)	-	-	-	7	-	-	-	.06
F	Verbascum thapsus	-	-	-	5	-	-	-	.03
F	Zigadenus paniculatus	a <sup>-</sup>	ab <sup>8</sup>	b <sup>10</sup>	c <sup>23</sup>	-	.01	.06	.51
Total for Annual Forbs		54	22	35	365	0.17	0.14	0.10	1.44
Total for Perennial Forbs		103	64	81	203	7.40	2.50	2.88	3.45
Total for Forbs		157	86	116	568	7.57	2.64	2.98	4.90

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

#### BROWSE TRENDS--

Management unit 22, Study no: 3

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	3.79	4.25	6.72	9.94	7.33	13.60	14.76
B	Cercocarpus ledifolius	.15	-	-	-	-	-	-
B	Chrysothamnus depressus	-	.03	-	-	.08	-	-
B	Chrysothamnus viscidiflorus	-	-	-	.03	-	-	-
B	Juniperus osteosperma	.85	.98	1.00	-	1.40	1.71	-
B	Opuntia sp.	.36	.21	.03	.03	.20	.16	-
B	Pinus ponderosa	-	-	-	.00	-	-	-
B	Purshia tridentata	.18	.91	1.03	.81	.38	.03	.50
B	Quercus gambelii	.21	.30	.30	.30	1.21	.91	1.25
Total for Browse		5.54	6.68	9.09	11.12	10.60	16.41	16.51

**BASIC COVER--**

Management unit 22, Study no: 3

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	46.47	30.70	33.64	38.65
Rock	19.61	23.41	22.58	25.68
Pavement	1.47	1.69	4.10	1.03
Litter	48.23	31.67	34.90	39.82
Cryptogams	.05	.00	0	.03
Bare Ground	9.83	26.12	16.00	16.68

**PELLET GROUP DATA--**

Management unit 22, Study no: 3

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	5	7	75	1	-	-	-	-
Elk	1	-	2	2	-	3 (7)	3 (7)	1 (3)
Deer	25	16	14	13	39 (96)	46 (114)	30 (74)	18 (45)
Cattle	17	6	10	3	75 (185)	25 (63)	16 (39)	33 (82)

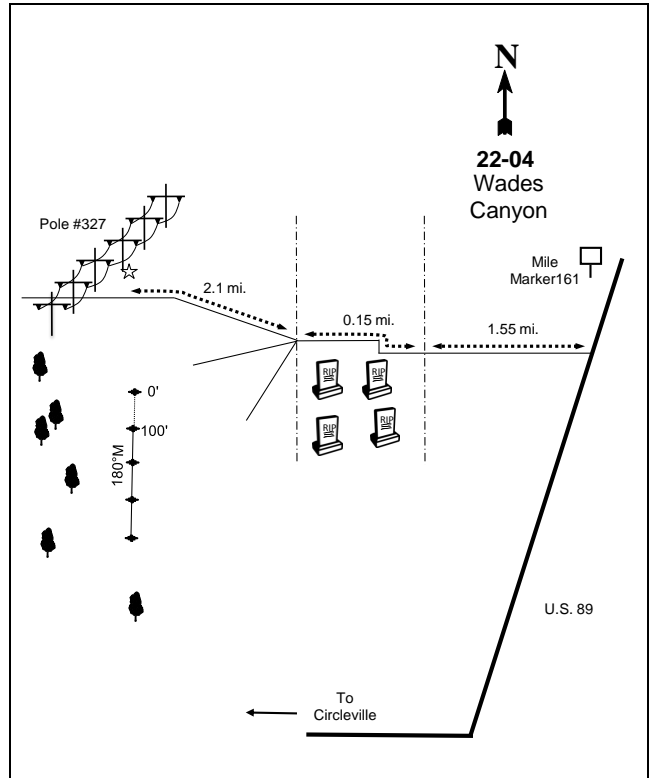
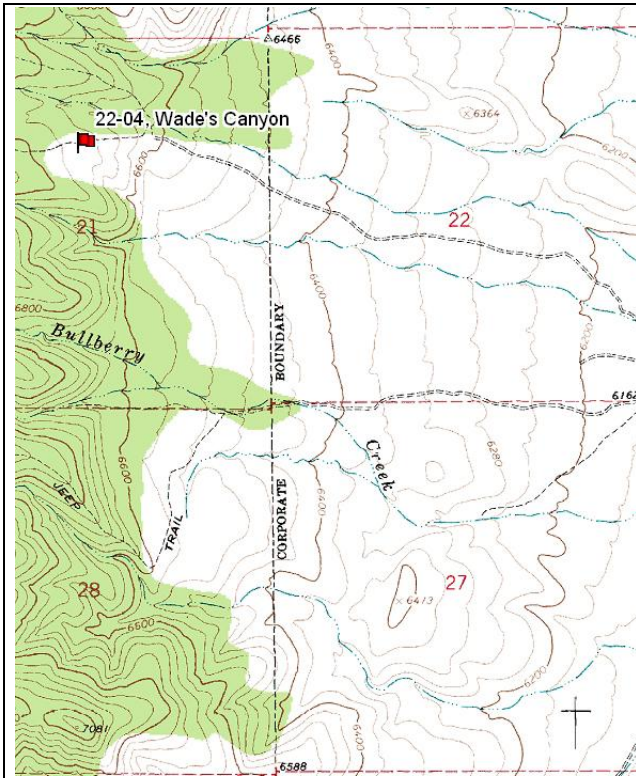
**BROWSE CHARACTERISTICS--**

Management unit 22, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia tridentata vaseyana</b>									
98	<b>1240</b>	26	60	15	20	31	0	3	21/26
03	<b>1240</b>	10	68	23	-	24	11	2	26/30
08	<b>1980</b>	25	62	13	120	35	2	2	24/38
13	<b>5800</b>	77	21	2	3280	2	0	1	24/37
<b>Cercocarpus ledifolius</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	100	0	23/22
08	<b>20</b>	0	100	-	-	100	0	0	21/27
13	<b>20</b>	0	100	-	-	0	100	0	19/18
<b>Chrysothamnus depressus</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	7/13
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus nauseosus hololeucus</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	100	0	-/-
08	<b>20</b>	0	100	-	-	0	100	0	5/7
13	<b>0</b>	0	0	-	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus viscidiflorus</b>									
98	20	0	100	-	-	0	0	0	6/10
03	20	0	100	-	-	0	0	0	9/10
08	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	5/8
<b>Juniperus osteosperma</b>									
98	40	0	100	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Opuntia sp.</b>									
98	140	0	86	14	20	0	0	0	7/12
03	120	0	100	0	-	0	0	0	5/11
08	40	0	50	50	20	0	0	50	5/10
13	80	50	50	0	-	0	0	0	5/10
<b>Pinus ponderosa</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	20	0	0	0	-/-
<b>Purshia tridentata</b>									
98	120	0	100	0	-	0	100	0	11/26
03	120	0	83	17	-	0	100	17	11/30
08	120	0	100	0	-	17	83	0	10/28
13	120	0	83	17	-	0	83	17	12/35
<b>Quercus gambelii</b>									
98	520	62	38	0	20	42	0	0	24/24
03	960	4	96	0	-	0	0	0	27/23
08	840	14	83	2	-	69	0	0	31/25
13	620	13	77	10	-	23	16	26	33/21

WADES CANYON - TREND STUDY NO. 22-4



**Location Information**

USGS 7.5 min Map Info      Circleville; Township 30S, Range 4W, Section 21  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 384641 East 4227554 North

**Transect Information**

Browse Tag # (0' Stake)      7045  
 Transect Bearing              180° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement        Standard

**Directions to Site**

From 300 W and Main St in Circleville, go north on 300 W for 0.4 miles to 400 N. Turn west and go 1.55 miles through the north end of Circleville to a jog in the road. Continue west past the jog 0.15 miles to the Circleville cemetery. Drive around the cemetery to the northeast corner. From the corner, a faint road takes off at a 45-degree angle to the northwest. Proceed up this road 2.1 miles to the point where it crosses under a high tension powerline. Stop here. The pole (# 327) nearest the road has a red browse tag #7046 attached under a yellow reflector. Walk 300 feet due south to the first frequency baseline stake. The 0-foot stake is a 2-1/2 foot tall rebar tagged #7045. There is an unmarked pellet group transect here also.

**Site Information**

Land Ownership USFS  
 Allotment Circleville  
 Elevation 6,700ft (2,042m)  
 Aspect East  
 Slope 4-8%  
 Sample Dates 07/31/1985, 07/09/1991, 07/02/1998, 07/18/2003, 06/25/2008, 05/30/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

VEGETATION HISTORY--

Management unit 22, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2008	Wyoming Big Sagebrush	Phase I
2013	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Historic pellet group data from 1976-1990 is available from the Wades Canyon pellet group transect that is located near the study site (Jense, et al., Utah Big Game Annual Report, 1985).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical Soil Classification Not available  
 NRCS Ecological Site Upland Stony Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY334UT

SOIL ANALYSIS DATA--

Management unit 22, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	42.0	31.4	26.6	7.1	0.7	3.0	8.8	96.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since the establishment of the study in 1985, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has been the dominant shrub component of the site. The herbaceous understory has consisted of mostly native species that are moderately diverse, though cheatgrass has been sampled on the site in low frequency and cover (Appendix B -Pre-1992 Data, Table - Herbaceous Trends). Since study establishment, the shrub and herbaceous components have remained in a stable state with Wyoming big sagebrush being dominant throughout the study years. Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have gradually increased in density while cover has remained generally stable (Table - Point-Quarter Tree Data, Table - Browse Trend). Without a tree-removing disturbance, the site will likely transition to a pinyon and juniper dominated state.



## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 22, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	14.2	-3.3	4.0	25.9	0.0	7.7	0.0	<b>48.5</b>	Good
2003	10.7	0.9	2.5	10.7	0.0	1.3	0.0	<b>26.0</b>	Poor-Fair
2008	8.1	-2.7	2.0	14.9	0.0	0.6	0.0	<b>22.9</b>	Poor
2013	11.3	9.3	2.5	19.3	-0.1	2.1	0.0	<b>44.4</b>	Fair-Good

## HERBACEOUS TRENDS--

Management unit 22, Study no: 4

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Bromus tectorum (a)	a1	a5	a6	b43	.00	.03	.01	.15
G	Oryzopsis hymenoides	169	154	164	185	5.26	4.77	5.23	5.60
G	Poa fendleriana	-	-	-	5	-	-	-	.15
G	Sitanion hystrix	c196	a76	b130	c155	7.67	.59	2.07	3.90
G	Stipa comata	-	-	3	1	-	-	.15	.00
Total for Annual Grasses		1	5	6	43	0.00	0.03	0.01	0.15
Total for Perennial Grasses		365	230	297	346	12.94	5.36	7.45	9.65
Total for Grasses		366	235	303	389	12.94	5.39	7.46	9.81
F	Arabis sp.	-	-	-	4	-	-	-	.00
F	Astragalus calycosus	12	2	17	2	.08	.00	.03	.03
F	Castilleja chromosa	-	-	-	2	-	-	-	.00
F	Chaenactis douglasii	3	-	-	-	.00	-	-	-
F	Delphinium occidentale	-	1	-	-	-	.00	-	-
F	Descurainia pinnata (a)	a-	b62	a-	ab2	-	.28	-	.00
F	Erigeron pumilus	c123	a2	a19	b43	1.21	.01	.07	.38
F	Eriogonum racemosum	-	-	8	-	-	-	.01	-
F	Gilia sp. (a)	a-	b227	a-	a-	-	1.75	-	-
F	Lappula occidentalis (a)	a-	b13	a-	ab2	-	.14	-	.00
F	Mentzelia sp.	a-	b13	ab2	a-	-	.07	.00	-
F	Phlox hoodii	b92	a49	a21	a35	2.44	.53	.16	.44
F	Physaria chambersii	b34	a-	ab3	b31	.10	-	.00	.17
Total for Annual Forbs		0	302	0	4	0	2.18	0	0.01
Total for Perennial Forbs		264	67	70	117	3.84	0.63	0.29	1.04
Total for Forbs		264	369	70	121	3.84	2.81	0.29	1.05

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

BROWSE TRENDS--

Management unit 22, Study no: 4

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	11.38	8.52	6.50	9.07	6.21	8.80	10.66
B	Chrysothamnus viscidiflorus stenophyllus	8.23	7.47	5.51	5.22	8.13	7.25	7.15
B	Gutierrezia sarothrae	.79	.68	.38	.70	.06	.86	.90
B	Juniperus osteosperma	.78	2.01	1.48	1.83	2.16	2.40	2.40
B	Opuntia sp.	.03	.03	.06	.18	-	-	-
B	Pinus edulis	.63	-	.03	.00	1.20	.26	.85
Total for Browse		21.85	18.71	13.97	17.01	17.76	19.57	21.96

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 4

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	47	58	63	68	5.1	3.8	4.0	4.4
Pinus edulis	58	67	67	67	4.7	2.7	2.2	2.5

BASIC COVER--

Management unit 22, Study no: 4

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	34.92	27.25	24.67	28.85
Rock	17.62	16.10	12.14	13.02
Pavement	30.56	24.56	33.63	28.47
Litter	26.46	26.49	29.25	29.29
Cryptogams	2.44	4.17	3.34	4.14
Bare Ground	6.94	11.24	8.40	7.68

PELLET GROUP DATA--

Management unit 22, Study no: 4

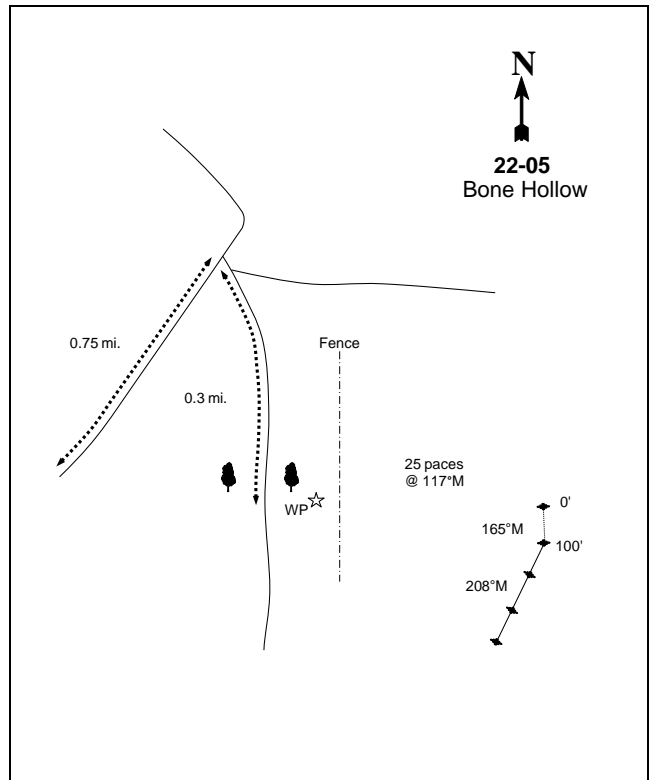
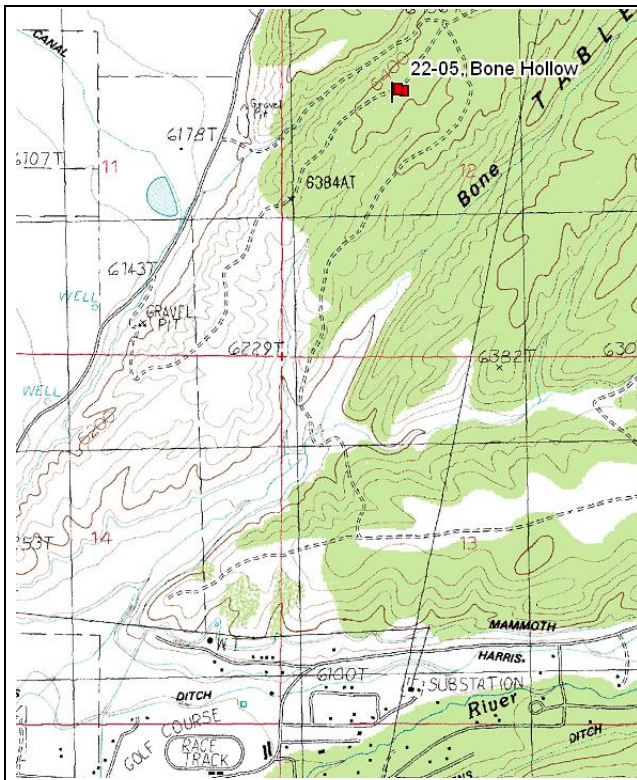
Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	18	10	92	1	-	-	-	-
Elk	-	2	10	2	-	3 (8)	14 (36)	4 (10)
Deer	24	31	63	27	42 (104)	154 (380)	119 (294)	50 (122)
Cattle	-	-	-	-	-	-	-	3 (7)

BROWSE CHARACTERISTICS--

Management unit 22, Study no: 4

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
98	2920	8	31	61	60	26	4	64	19/27	
03	2920	5	48	47	-	55	11	21	19/24	
08	2940	4	37	59	20	37	22	33	16/24	
13	2560	5	77	19	380	45	33	12	17/29	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
98	4840	7	88	5	-	1	0	2	12/16	
03	5860	1	97	2	-	0	0	.34	13/16	
08	6140	1	55	43	-	40	.97	7	9/13	
13	4560	11	89	0	80	16	16	3	8/14	
<i>Gutierrezia sarothrae</i>										
98	1680	20	76	4	-	0	0	4	8/9	
03	6020	80	18	2	-	0	0	.99	7/6	
08	2100	16	69	15	420	3	0	12	6/7	
13	3720	76	24	0	160	.53	0	0	4/5	
<i>Juniperus osteosperma</i>										
98	40	50	50	0	-	0	0	0	-/-	
03	60	0	100	0	-	0	0	0	-/-	
08	40	0	50	50	-	0	0	0	-/-	
13	60	0	67	33	-	33	0	0	-/-	
<i>Opuntia sp.</i>										
98	40	0	100	-	-	0	0	0	5/11	
03	80	0	100	-	-	0	0	0	4/9	
08	60	0	100	-	-	0	0	0	5/9	
13	80	0	100	-	-	0	0	0	4/12	
<i>Pediocactus simpsonii</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	3/3	
13	0	0	0	-	-	0	0	0	-/-	
<i>Pinus edulis</i>										
98	40	0	100	-	-	0	0	0	-/-	
03	60	67	33	-	-	0	0	0	-/-	
08	80	75	25	-	-	0	0	0	-/-	
13	100	80	20	-	-	0	0	0	-/-	

BONE HOLLOW - TREND STUDY NO. 22-5



**Location Information**

USGS 7.5 min Map Info      Black Ridge; Township 29S, Range 7W, Section 12  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 360382 East 4240689 North

**Transect Information**

Browse Tag # (0' Stake)      7048  
 Transect Bearing              165° magnetic (Lines 2-4: 208° magnetic)  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

From the intersection of North Creek Road and SR 153 on the east side of Beaver, go north 1.95 miles past an irrigation pond on the left to a gravel pit on the right. On the south side of the gravel pit a good dirt road goes northeast up the bottom of a draw (ignore the numerous other small dirt roads). Drive up this road 0.75 miles to a fork. Turn right onto another major dirt road and go south 0.3 miles. Look for a fencepost 50 feet to the left that is not part of the fence (30 feet north of metal cross posts). The fencepost marks the start of a pellet group transect. Walk 25 paces at 117 degrees magnetic from the witness post to the 0' stake marked by a 3-foot rebar tagged #7048.

**Site Information**

Land Ownership BLM  
 Allotment North Creek  
 Elevation 6,390ft (1,948m)  
 Aspect South  
 Slope 5%  
 Sample Dates 08/01/1985, 07/29/1991, 06/15/1998, 06/17/2003, 06/12/2008, 05/29/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

VEGETATION HISTORY--

Management unit 22, Study no: 5

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2003	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2008-2013	Wyoming Big Sagebrush/Pinyon-Juniper	Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This site is typical of the untreated winter ranges on the benches above Beaver, which have historically been important deer winter range.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical Soil Classification Fine-loamy, mixed, mesic Calciorthidic Haploxerolls  
 NRCS Ecological Site Upland Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY309UT

SOIL ANALYSIS DATA--

Management unit 22, Study no: 5

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	52.4	23.1	24.6	6.7	0.7	2.6	8.5	96.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1985, the site was a mixed stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), pinyon pine (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*) with a sparse herbaceous understory (Appendix B -Pre-1992 Data). The invasive annual grass species cheatgrass (*Bromus tectorum*) has been a major component of the herbaceous understory, though abundance has fluctuated over the sample years (Table - Herbaceous Trends). Pinyon pine and Utah juniper have increased in size and density over the sample years (Table - Point-Quarter Tree Data), while sagebrush has decreased in density and cover (Table - Browse Characteristics, Table Browse Trends). Without a tree-removing disturbance, this site will likely transition to a pinyon and juniper dominated state. In addition, the high abundance of cheatgrass sampled on the site over the sample years may pose a risk to the resilience of the plant community following a major disturbance.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 22, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	21.8	4.5	2.0	9.0	-15.2	1.6	0.0	<b>23.7</b>	Poor-Fair
2003	19.2	1.3	0.0	10.0	-2.1	0.6	0.0	<b>29.1</b>	Fair
2008	15.4	-2.7	1.5	12.4	0.0	0.8	0.0	<b>27.4</b>	Fair
2013	12.7	8.1	4.5	15.7	-3.0	1.7	0.0	<b>39.7</b>	Fair

## HERBACEOUS TRENDS--

Management unit 22, Study no: 5

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron intermedium	a <sup>-</sup>	ab <sup>1</sup>	a <sup>-</sup>	b <sup>16</sup>	-	.00	-	.08
G	Agropyron spicatum	1	-	2	3	.03	.00	.38	.38
G	Bouteloua gracilis	13	13	13	19	.12	.39	.39	.86
G	Bromus tectorum (a)	d <sup>475</sup>	b <sup>213</sup>	a <sup>10</sup>	c <sup>367</sup>	20.28	2.75	.04	3.95
G	Oryzopsis hymenoides	a <sup>37</sup>	a <sup>37</sup>	ab <sup>43</sup>	b <sup>62</sup>	1.51	1.95	2.88	3.27
G	Poa fendleriana	-	-	-	5	-	-	-	.03
G	Poa secunda	a <sup>2</sup>	a <sup>10</sup>	a <sup>1</sup>	b <sup>29</sup>	.00	.05	.03	.45
G	Sitanion hystrix	b <sup>111</sup>	ab <sup>94</sup>	a <sup>74</sup>	a <sup>61</sup>	2.21	2.35	1.72	1.00
G	Stipa comata	a <sup>12</sup>	a <sup>14</sup>	a <sup>15</sup>	b <sup>64</sup>	.64	.26	.79	1.79
G	Vulpia octoflora (a)	-	1	-	1	-	.00	-	.00
Total for Annual Grasses		475	214	10	368	20.28	2.76	0.04	3.96
Total for Perennial Grasses		176	169	148	259	4.52	5.01	6.20	7.87
Total for Grasses		651	383	158	627	24.80	7.77	6.25	11.83
F	Agoseris glauca	b <sup>17</sup>	a <sup>-</sup>	a <sup>1</sup>	ab <sup>7</sup>	.11	-	.00	.01
F	Alyssum alyssoides (a)	ab <sup>9</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>70</sup>	.01	-	-	.16
F	Antennaria sp.	4	-	3	6	.01	-	.03	.01
F	Arabis demissa	5	5	-	-	.04	.01	-	-
F	Astragalus sp.	b <sup>18</sup>	a <sup>-</sup>	ab <sup>9</sup>	a <sup>-</sup>	.10	-	.01	-
F	Camelina microcarpa (a)	-	3	-	6	-	.03	-	.01
F	Chaenactis douglasii	5	-	-	-	.01	-	-	-
F	Collinsia parviflora (a)	-	8	6	-	-	.01	.04	-
F	Cryptantha sp.	a <sup>-</sup>	b <sup>9</sup>	a <sup>-</sup>	ab <sup>1</sup>	-	.11	-	.00
F	Descurainia pinnata (a)	3	9	-	2	.00	.02	-	.00
F	Draba sp. (a)	-	10	-	6	-	.01	-	.01
F	Erigeron pumilus	3	-	-	-	.00	-	-	-
F	Gayophytum ramosissimum(a)	-	8	2	-	-	.01	.00	-
F	Gilia sp. (a)	a <sup>-</sup>	b <sup>145</sup>	a <sup>-</sup>	a <sup>-</sup>	-	1.28	-	-
F	Holosteum umbellatum (a)	-	1	-	2	-	.00	-	.01
F	Lappula occidentalis (a)	-	6	3	4	-	.03	.01	.03
F	Leucelene ericoides	5	12	3	10	.03	.02	.00	.18

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Microsteris gracilis</i> (a)	1	5	-	7	.00	.01	-	.01
F	<i>Phlox austromontana</i>	<sub>b</sub> 28	<sub>a</sub> 5	<sub>a</sub> 7	<sub>a</sub> 6	.23	.04	.01	.18
F	<i>Polygonum douglasii</i> (a)	-	-	-	1	-	-	-	.00
F	<i>Ranunculus testiculatus</i> (a)	<sub>a</sub> 37	<sub>b</sub> 88	<sub>c</sub> 225	<sub>d</sub> 322	.16	.84	.39	2.68
F	<i>Schoenrambe linifolia</i>	-	3	-	-	-	.00	-	-
F	<i>Senecio multilobatus</i>	-	-	1	3	-	-	.15	.03
F	<i>Sphaeralcea coccinea</i>	<sub>ab</sub> 18	<sub>ab</sub> 20	<sub>a</sub> 15	<sub>b</sub> 30	.22	.13	.17	.41
Total for Annual Forbs		50	283	236	420	0.18	2.27	0.44	2.93
Total for Perennial Forbs		103	54	39	63	0.79	0.31	0.39	0.85
Total for Forbs		153	337	275	483	0.97	2.59	0.84	3.79

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

#### BROWSE TRENDS--

Management unit 22, Study no: 5

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata wyomingensis</i>	17.43	15.22	12.32	10.14	11.90	9.93	10.76
B	<i>Atriplex canescens</i>	-	.15	-	-	-	-	-
B	<i>Chrysothamnus nauseosus</i>	.03	-	-	-	-	-	-
B	<i>Gutierrezia sarothrae</i>	.06	-	-	.00	-	-	-
B	<i>Juniperus osteosperma</i>	4.32	7.50	5.62	7.31	12.43	15.31	19.28
B	<i>Opuntia</i> sp.	.03	.15	-	-	.16	-	-
B	<i>Pediocactus simpsonii</i>	-	-	.00	-	-	-	-
B	<i>Pinus edulis</i>	2.65	4.05	3.79	5.25	5.20	2.66	6.18
B	<i>Sclerocactus</i> sp.	.00	-	-	.00	-	-	-
Total for Browse		24.54	27.07	21.74	22.71	29.69	27.9	36.22

#### POINT-QUARTER TREE DATA--

Management unit 22, Study no: 5

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
<i>Juniperus osteosperma</i>	149	196	222	206	4.5	3.4	5.4	2.5
<i>Pinus edulis</i>	39	63	61	81	3.3	2.8	3.9	4.6

**BASIC COVER--**

Management unit 22, Study no: 5

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	41.04	35.17	28.94	42.38
Rock	6.06	3.44	2.30	2.84
Pavement	27.36	31.30	33.33	24.93
Litter	48.47	34.86	45.30	48.50
Cryptogams	.26	.07	.00	0
Bare Ground	14.31	12.32	9.21	7.23

**PELLET GROUP DATA--**

Management unit 22, Study no: 5

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	34	4	81	14	-	-	-	-
Elk	-	-	5	4	-	-	3 (7)	-
Deer	66	27	34	44	93 (230)	132 (326)	150 (370)	28 (69)
Cattle	1	-	-	-	-	-	-	-

**BROWSE CHARACTERISTICS--**

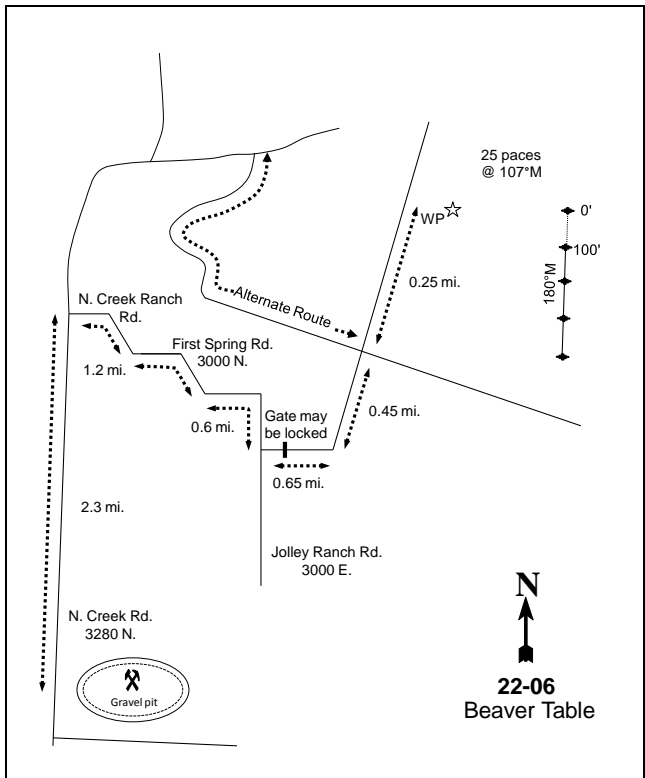
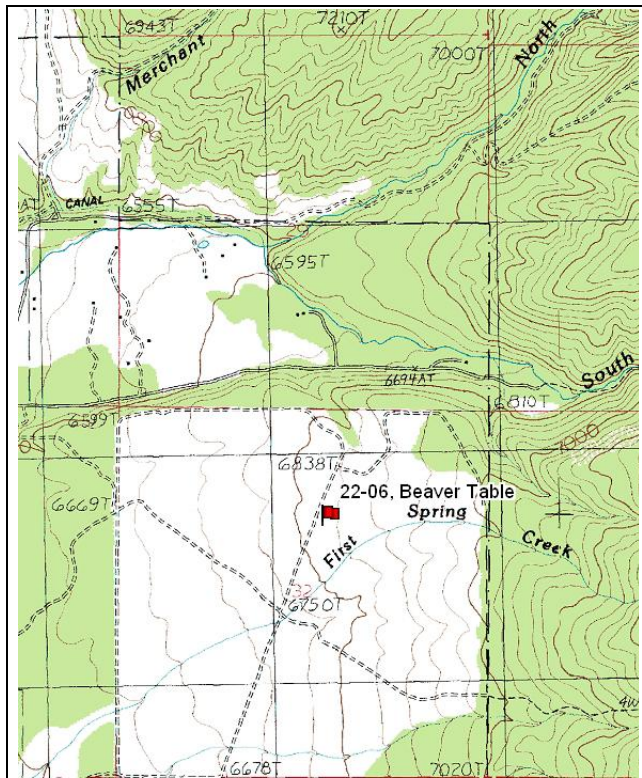
Management unit 22, Study no: 5

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia tridentata wyomingensis</i>									
98	<b>4680</b>	4	61	35	80	59	18	8	17/27
03	<b>3920</b>	0	54	46	-	32	37	12	19/27
08	<b>3140</b>	3	38	59	320	32	18	19	23/30
13	<b>3040</b>	9	68	23	80	57	26	15	19/31
<i>Chrysothamnus depressus</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus nauseosus</i>									
98	<b>20</b>	0	100	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus parryi</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	0	0	6/6
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
98	100	0	100	-	80	0	0	0	7/9	
03	20	100	0	-	-	0	0	0	8/8	
08	60	0	100	-	-	0	0	0	5/5	
13	320	13	88	-	-	0	0	0	6/9	
<i>Juniperus osteosperma</i>										
98	240	67	33	-	180	0	0	0	-/-	
03	280	57	43	-	20	0	0	0	-/-	
08	280	71	29	-	20	0	0	0	-/-	
13	300	67	33	-	20	0	0	0	-/-	
<i>Mahonia repens</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	80	0	100	-	-	0	0	0	5/10	
03	60	0	100	-	-	0	0	0	4/9	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	4/11	
<i>Pediocactus simpsonii</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	20	0	0	0	1/2	
13	20	0	100	-	-	0	0	0	1/4	
<i>Pinus edulis</i>										
98	40	100	0	-	-	0	0	0	-/-	
03	140	86	14	-	-	0	0	0	-/-	
08	120	83	17	-	-	0	0	17	-/-	
13	100	60	40	-	-	0	0	0	-/-	
<i>Sclerocactus sp.</i>										
98	20	0	100	-	-	0	0	0	2/4	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	2/2	

BEAVER TABLE - TREND STUDY NO. 22-6



**Location Information**

USGS 7.5 min Map Info      Black Ridge; Township 28S, Range 6W, Section 32  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 364158 East 4243887 North

**Transect Information**

Browse Tag # (0' Stake)      7049  
 Transect Bearing              180° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Belt 5: 2ft

**Directions to Site**

From the corner of North Creek Road and SR 153 in Beaver, go north 1.95 miles to a gravel pit on the right. From the gravel pit, continue on North Creek Road for 2.3 miles. Turn on to North Creek Ranch Road and follow for 1.2 miles and then turn onto First Spring Road (3000 N) for 0.6 miles. Then turn onto Jolley Ranch Road (3000 N) and take the first left. Continue for 0.35 miles and go through the gate (may be locked use alternate route). There should be a WMA boundary to the south. Go east past the boundary fence 0.25 miles to another fence line with a fork just beyond it. Go straight (east) another 0.25 miles to a junction with a road going north-south, then turn left (north). Go 0.45 miles to a junction with a road going from east to west. Continue north 0.2 miles to a witness post on the right. From the witness post walk 22 paces at 107 degrees magnetic. The 0-foot stake is marked by rebar tagged #7049.

**Site Information**

Land Ownership UDWR  
 Allotment North Creek  
 Elevation 6,870ft (2,094m)  
 Aspect West  
 Slope 3-5%  
 Sample Dates 08/02/1985, 07/29/1991, 06/29/1998, 06/18/2003, 06/12/2008, 06/03/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 6

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Cable	-	-	1957	-
Seeding	-	-	1957	-
Lop and Scatter	-	-	2003-2008	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 6

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-1998	Wyoming Big Sagebrush	Phase I
2003-2013	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Historic pellet group data from 1981-1997 is available from a DWR pellet group transect that is located near the study site (Jense, et al., 1985; Jense, et al., 1991; Evans, et al., 1997). A buck and a doe were bedded down on the site in 2003. The lop and scatter treatment was primarily on the west side of the road and only removed a few trees near the south end of the transect.

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Coarse-loamy, mixed, mesic Aridic Petrocalcic Palexerolls  
 NRCS Ecological Site Upland Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY309UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 6

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay	36.7	22.7	40.6	6.6	0.6	2.2	10.6	73.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1985, the site was a mixed stand of mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*) and broom snakeweed (*Gutierrezia sarothrae*). Herbaceous understory vegetation has remained relatively stable over the sample years. The introduced annual grass species cheatgrass (*Bromus tectorum*) has fluctuated in cover and frequency over the sample years (Table - Herbaceous Trends, Appendix B -Pre-1992

Data). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have increased in size since the establishment of the study site, though some of the trees were lop and scattered between 2003 and 2008 (Table - Browse Characteristics, Table - Browse Trends). Without a tree-removing disturbance, this site will likely transition to a pinyon and juniper dominated state. In addition, the high abundance of cheatgrass sampled on the site over the sample years may pose a risk to the resilience of the plant community following a major disturbance.

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 22, study no: 6

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	22.0	3.3	4.3	14.8	-8.4	2.2	0.0	<b>38.2</b>	Fair
2003	28.4	5.9	0.0	6.0	-0.5	1.6	0.0	<b>41.5</b>	Fair
2008	22.4	1.1	1.7	6.7	-0.1	0.5	0.0	<b>32.1</b>	Fair
2013	25.2	9.5	4.1	8.3	-0.2	3.3	0.0	<b>50.2</b>	Good

### HERBACEOUS TRENDS--

Management unit 22, Study no: 6

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	1	3	12	3	.00	.03	.10	.01
G	Agropyron intermedium	-	-	1	-	-	-	.15	-
G	Agropyron spicatum	<sub>b</sub> 16	<sub>a</sub> 6	<sub>ab</sub> 5	<sub>a</sub> 1	.44	.01	.21	.15
G	Bromus japonicus (a)	5	5	5	-	.03	.01	.03	-
G	Bromus tectorum (a)	<sub>c</sub> 414	<sub>b</sub> 84	<sub>a</sub> 23	<sub>b</sub> 101	11.17	.61	.07	.21
G	Oryzopsis hymenoides	54	35	50	37	2.58	1.09	1.46	.56
G	Poa fendleriana	20	43	18	39	.71	.56	.44	1.25
G	Poa pratensis	<sub>ab</sub> 1	<sub>ab</sub> 2	<sub>b</sub> 14	<sub>a</sub> -	.03	.03	.14	-
G	Poa secunda	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 43	-	-	-	1.21
G	Sitanion hystrix	<sub>b</sub> 121	<sub>a</sub> 63	<sub>a</sub> 57	<sub>a</sub> 47	3.65	1.27	.66	.98
G	Stipa lettermani	-	-	4	-	-	-	.15	-
Total for Annual Grasses		419	89	28	101	11.20	0.62	0.10	0.21
Total for Perennial Grasses		213	152	161	170	7.42	3.00	3.33	4.17
Total for Grasses		632	241	189	271	18.62	3.62	3.43	4.39
F	Agoseris glauca	7	4	7	11	.01	.01	.04	.02
F	Alyssum alyssoides (a)	<sub>a</sub> 5	<sub>a</sub> 9	<sub>b</sub> 199	<sub>c</sub> 394	.01	.03	.53	2.11
F	Antennaria sp.	6	1	1	13	.04	.00	.03	.10
F	Arabis demissa	6	3	-	3	.01	.01	-	.00
F	Astragalus convallarius	<sub>b</sub> 8	<sub>ab</sub> 4	<sub>a</sub> -	<sub>ab</sub> 3	.15	.06	-	.03
F	Astragalus newberryi	4	-	-	-	.03	-	-	-
F	Calochortus nuttallii	<sub>a</sub> -	<sub>b</sub> 15	<sub>b</sub> 8	<sub>ab</sub> 5	-	.06	.05	.01
F	Castilleja chromosa	-	-	1	-	.00	-	.00	-
F	Chaenactis douglasii	<sub>ab</sub> 6	<sub>ab</sub> 1	<sub>a</sub> -	<sub>b</sub> 9	.04	.00	-	.05
F	Collinsia parviflora (a)	-	-	-	2	-	-	-	.00

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Cymopterus sp.	-	7	2	6	-	.01	.01	.04
F	Descurainia pinnata (a)	-	1	-	3	-	.00	-	.00
F	Epilobium brachycarpum (a)	b34	b10	a-	ab1	.09	.02	-	.00
F	Erigeron sp.	-	1	-	2	-	.00	-	.00
F	Eriogonum caespitosum	-	7	-	5	-	.03	-	.18
F	Eriogonum racemosum	-	-	-	1	-	-	-	.00
F	Eriogonum umbellatum	6	3	-	2	.06	.01	-	.01
F	Gayophytum ramosissimum(a)	-	7	7	4	-	.05	.06	.01
F	Gilia sp. (a)	-	6	-	-	-	.02	-	-
F	Lactuca serriola (a)	2	-	-	-	.00	-	-	-
F	Lappula occidentalis (a)	-	1	10	2	-	.00	.04	.00
F	Lomatium sp.	-	-	-	6	-	-	-	.01
F	Lotus utahensis	1	2	-	-	.00	.01	-	-
F	Machaeranthera canescens	b10	a-	a-	a-	.17	-	-	.00
F	Penstemon sp.	1	-	-	-	.03	-	-	-
F	Phlox longifolia	ab47	b58	a16	b58	.15	.18	.03	.18
F	Polygonum douglasii (a)	ab9	b26	a2	ab11	.02	.05	.00	.02
F	Ranunculus testiculatus (a)	a-	ab2	ab4	b38	-	.01	.01	.06
F	Senecio multilobatus	b12	b21	a-	c43	.07	.07	-	.90
F	Sphaeralcea coccinea	23	25	18	22	.30	.25	.05	.04
F	Streptanthus cordatus	-	-	2	1	-	-	.00	.00
F	Trifolium sp.	-	9	-	2	-	.07	-	.01
F	Zigadenus paniculatus	-	-	1	3	-	-	.00	.00
Total for Annual Forbs		50	62	222	455	0.12	0.19	0.66	2.23
Total for Perennial Forbs		137	161	56	195	1.10	0.81	0.23	1.63
Total for Forbs		187	223	278	650	1.22	1.01	0.90	3.86

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

#### BROWSE TRENDS--

Management unit 22, Study no: 6

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	13.81	17.86	16.60	16.91	18.85	23.06	30.81
B	Gutierrezia sarothrae	4.11	.36	.52	.96	.10	.38	.45
B	Juniperus osteosperma	.78	1.38	-	1.01	1.40	.93	.90
B	Pinus edulis	-	-	.15	.15	-	.10	.20
B	Purshia tridentata	3.15	4.05	1.07	2.70	2.83	1.48	2.98
Total for Browse		21.86	23.66	18.34	21.73	23.18	25.95	35.34

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 6

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	107	95	89	90
Pinus edulis	-	-	-	33

Average diameter (in)			
'98	'03	'08	'13
5.0	4.6	6.5	7
-	-	-	1.7

BASIC COVER--

Management unit 22, Study no: 6

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	41.77	28.00	24.80	30.27
Rock	9.70	8.77	7.01	14.42
Pavement	11.98	6.87	19.57	13.56
Litter	47.05	33.61	41.82	30.62
Cryptogams	.02	.81	.31	.87
Bare Ground	18.16	37.97	22.12	28.60

PELLET GROUP DATA--

Management unit 22, Study no: 6

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	39	6	68	24
Elk	-	-	6	-
Deer	43	31	45	25
Cattle	-	-	1	-

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	15 (36)	3 (8)
47 (116)	71 (175)	125 (308)	52 (129)
-	2 (5)	-	-

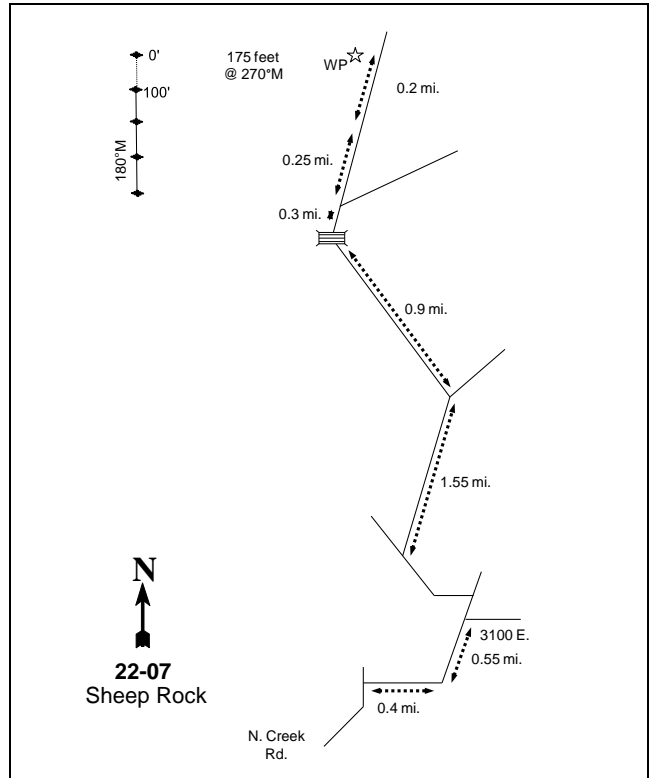
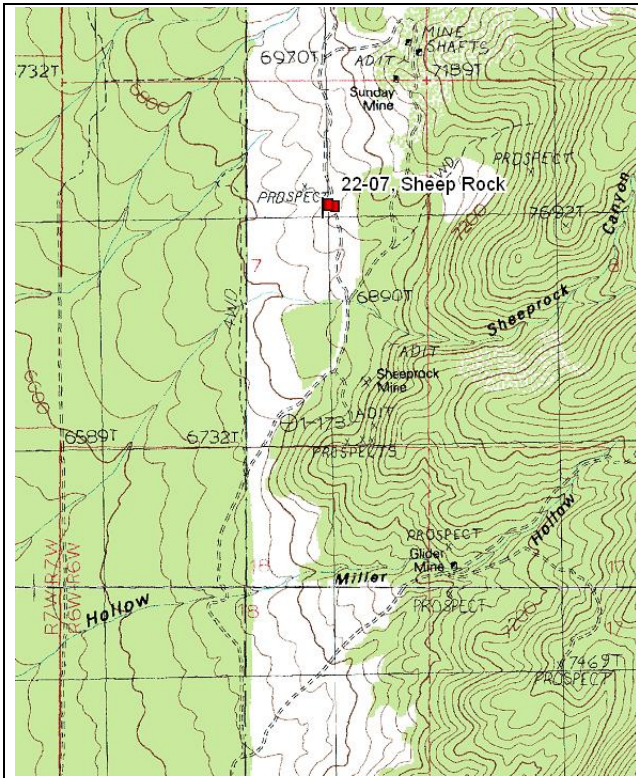
BROWSE CHARACTERISTICS--

Management unit 22, Study no: 6

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia tridentata wyomingensis</b>									
98	<b>5420</b>	2	51	48	20	43	8	13	19/26
03	<b>5740</b>	0	69	31	-	49	8	7	20/26
08	<b>4720</b>	3	53	44	60	39	29	13	29/30
13	<b>4000</b>	6	76	19	180	52	22	8	20/32
<b>Gutierrezia sarothrae</b>									
98	<b>7640</b>	31	69	0	360	0	0	0	13/11
03	<b>1600</b>	26	68	6	60	0	0	0	7/6
08	<b>2880</b>	4	94	1	60	0	0	0	6/6
13	<b>2280</b>	53	47	0	40	0	0	0	7/8
<b>Juniperus osteosperma</b>									
98	<b>60</b>	33	67	-	20	0	0	0	-/-
03	<b>60</b>	0	100	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>40</b>	0	100	-	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Leptodactylon pungens</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	5/3
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	4/11
<b>Opuntia sp.</b>									
98	0	0	0	-	-	0	0	0	7/19
03	0	0	0	-	-	0	0	0	6/9
08	0	0	0	-	-	0	0	0	6/13
13	0	0	0	-	-	0	0	0	6/14
<b>Pediocactus simpsonii</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	100	0	-	-	0	0	0	1/1
13	0	0	0	-	-	0	0	0	-/-
<b>Pinus edulis</b>									
98	20	100	0	-	20	0	0	0	-/-
03	40	100	0	-	-	0	0	0	-/-
08	60	33	67	-	-	0	0	0	-/-
13	20	100	0	-	20	0	0	0	-/-
<b>Purshia tridentata</b>									
98	780	38	62	0	40	36	18	0	27/46
03	600	0	73	27	-	10	83	13	27/36
08	740	8	8	84	-	11	59	24	11/15
13	540	22	63	15	100	33	48	11	21/35
<b>Ribes cereum cereum</b>									
98	100	0	100	-	-	0	0	0	12/16
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

SHEEP ROCK - TREND STUDY NO. 22-7



**Location Information**

USGS 7.5 min Map Info Pole Mountain; Township 28S, Range 6W, Section 7  
 GPS (0' Stake) NAD 83, UTM Zone 12, 362916 East 4250193 North

**Transect Information**

Browse Tag # (0' Stake) 7058  
 Transect Bearing 180° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the junction of SR 153 and North Creek Road (1200 E.) east of Beaver, proceed north on North Creek Road 5.0 miles to a fork (3800 N). Keep to the right on the pavement and continue 0.4 miles to another fork. Turn left onto 3100 E and drive 0.55 miles, crossing a bridge, to a fork in the road with a sheepprock sign. Turn left and after 100 yards take a sharp bend to the left to stay on the good road. Drive about 200 yards and keep to the right at another fork. Continue 0.175 miles and again keep right at a fork. Go 1.55 miles to a cattleguard and 0.15 miles beyond it to a fork. Turn to the left instead of crossing a cattleguard into a chained area. Drive 0.9 miles further to cross a cattleguard and enter the chained area (road # 589). Go 0.3 miles to a fork and stay left. After 0.25 miles you will again enter directly into the chained area. Continue 0.2 miles into the chaining to a witness post on the left side of the road. The frequency baseline starts 195 feet west of the witness post. The 0-foot baseline stake is a short rebar with browse tag #7058 attached.



**Site Information**

Land Ownership USFS  
 Allotment North-Indian  
 Elevation 6,910ft (2,106m)  
 Aspect West  
 Slope 5-10%  
 Sample Dates 08/02/1985, 07/29/1991, 06/15/1998, 06/18/2003, 06/03/2008, 06/03/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 7

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining (2-Way)	-	-	Fall 1981	-
Seeding	-	-	Fall 1981	-
Fire	-	-	1981-1984	-
Bullhog	-	-	2009-2011	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 7

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2003	Perennial Grass	Phase I
2008	Perennial Grass/Pinyon-Juniper	Phase I transitioning to Phase II
2013	Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

An elk shed antler was found on the site in 2013. Cattle presence was high in 1998 and 2003 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R028AY310UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 7

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	54.0	28.4	17.6	6.5	0.9	3.0	10.0	172.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1985, the site was dominated by introduced perennial grass species (Appendix B -Pre-1992 Data). Young pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) had reestablished on the site following the chaining completed in 1981, but provided limited cover. Shrub species were rare on the site. Since the establishment of the study, the site has remained in a stable state with introduced perennial

grass species being the dominant component of the site. The invasive annual grass species cheatgrass (*Bromus tectorum*) has been a major component of the herbaceous understory, though abundance has fluctuated over the sample years (Table - Herbaceous Trends). Pinyon and juniper trees increased in size and density until the bullhog treatment (2009-2011) (Table - Point-Quarter Tree Data, Table - Browse Characteristics). Shrubs have remained a minor component of the site.

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 22, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	2.6	0.0	0.0	30.0	-8.6	5.2	0.0	<b>29.1</b>	Very Poor
2003	1.9	0.0	0.0	26.2	-1.0	4.1	0.0	<b>31.2</b>	Very Poor
2008	1.1	0.0	0.0	30.0	-0.7	5.2	0.0	<b>35.6</b>	Very Poor-Poor
2013	0.4	0.0	0.0	30.0	-1.5	2.6	0.0	<b>31.5</b>	Very Poor

HERBACEOUS TRENDS--  
Management unit 22, Study no: 7

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	b <sub>192</sub>	a <sub>147</sub>	ab <sub>185</sub>	ab <sub>162</sub>	8.96	4.84	6.55	5.95
G	Agropyron intermedium	b <sub>210</sub>	a <sub>127</sub>	b <sub>191</sub>	b <sub>169</sub>	9.92	2.76	6.70	8.09
G	Agropyron spicatum	2	-	-	-	.03	-	-	-
G	Bromus inermis	c <sub>252</sub>	a <sub>123</sub>	a <sub>117</sub>	b <sub>181</sub>	9.84	2.64	4.74	8.71
G	Bromus tectorum (a)	c <sub>366</sub>	a <sub>106</sub>	b <sub>172</sub>	b <sub>153</sub>	11.51	1.31	.93	2.04
G	Elymus junceus	ab <sub>4</sub>	a <sub>1</sub>	b <sub>24</sub>	a <sub>3</sub>	.33	.03	.28	.03
G	Poa secunda	a <sub>45</sub>	b <sub>97</sub>	ab <sub>69</sub>	c <sub>131</sub>	.91	2.80	.83	3.47
G	Sitanion hystrix	4	-	8	3	.01	-	.03	.03
Total for Annual Grasses		366	106	172	153	11.51	1.31	0.93	2.04
Total for Perennial Grasses		709	495	594	649	30.01	13.08	19.15	26.29
Total for Grasses		1075	601	766	802	41.53	14.40	20.08	28.33
F	Agoseris glauca	4	4	1	9	.01	.03	.00	.05
F	Alyssum alyssoides (a)	a <sub>67</sub>	b <sub>125</sub>	c <sub>246</sub>	d <sub>446</sub>	.16	1.64	.79	4.16
F	Arabis sp.	5	-	7	-	.01	-	.01	-
F	Arenaria sp.	-	1	-	-	-	.00	-	-
F	Astragalus cibarius	a <sub>2</sub>	ab <sub>10</sub>	ab <sub>16</sub>	b <sub>15</sub>	.00	.36	.20	.11
F	Astragalus convallarius	1	-	3	-	.03	-	.00	-
F	Astragalus newberryi	-	-	5	-	-	-	.01	-
F	Calochortus nuttallii	2	4	9	5	.00	.01	.02	.01
F	Camelina microcarpa (a)	b <sub>18</sub>	ab <sub>2</sub>	a <sub>-</sub>	a <sub>-</sub>	.03	.03	-	-
F	Chaenactis douglasii	1	-	-	-	.00	-	-	-
F	Cirsium sp.	-	-	-	3	-	-	-	.01
F	Collinsia parviflora (a)	a <sub>57</sub>	b <sub>246</sub>	b <sub>201</sub>	a <sub>75</sub>	.11	4.73	.46	.17
F	Crepis acuminata	1	3	6	2	.03	.03	.01	.00
F	Cymopterus sp.	a <sub>1</sub>	a <sub>1</sub>	a <sub>1</sub>	b <sub>15</sub>	.00	.00	.01	.03

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Descurainia pinnata (a)	-	7	-	-	-	.03	-	-
F	Draba sp. (a)	ab14	b13	a-	ab2	.02	.03	-	.00
F	Eriogonum caespitosum	-	-	-	3	-	-	-	.15
F	Eriogonum ovalifolium	-	-	4	-	-	-	.03	-
F	Eriogonum racemosum	4	3	-	3	.03	.03	-	.00
F	Erodium cicutarium (a)	a-	ab3	ab8	b62	-	.03	.21	1.24
F	Gilia sp. (a)	a-	ab59	ab1	b-	-	.62	.00	-
F	Holosteum umbellatum (a)	ab3	b15	a-	b11	.01	.05	-	.03
F	Lappula occidentalis (a)	b33	c83	c106	a2	.10	2.67	.84	.01
F	Leucelene ericoides	5	-	-	-	.15	-	-	-
F	Medicago sativa	-	1	-	-	-	.03	-	-
F	Microsteris gracilis (a)	b21	c192	a-	ab2	.16	1.93	-	.00
F	Oenothera pallida	-	-	-	-	-	-	-	-
F	Orobanche fasciculata	2	-	-	-	.00	-	-	-
F	Phlox longifolia	2	11	5	11	.01	.05	.01	.02
F	Polygonum douglasii (a)	ab6	a-	b13	a-	.01	-	.03	-
F	Ranunculus testiculatus (a)	a5	b69	c189	a32	.06	1.30	1.66	.20
F	Sphaeralcea coccinea	-	-	3	-	-	-	.00	-
F	Streptanthus cordatus	-	5	6	6	-	.06	.04	.04
F	Tragopogon dubius (a)	2	-	-	-	.00	-	-	.00
F	Vicia americana	b114	a69	b127	b116	2.29	1.44	2.22	.85
Total for Annual Forbs		226	814	764	632	0.68	13.07	4.00	5.84
Total for Perennial Forbs		144	112	193	188	2.59	2.06	2.60	1.29
Total for Forbs		370	926	957	820	3.27	15.13	6.60	7.14

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

#### BROWSE TRENDS--

Management unit 22, Study no: 7

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	.63	.06	.15	.21	.56	.65	.81
B	Gutierrezia sarothrae	-	.15	.03	.39	-	.06	.35
B	Juniperus osteosperma	1.79	1.72	3.14	.63	2.31	3.98	-
B	Pediocactus simpsonii	-	-	-	.00	-	-	-
B	Pinus edulis	-	-	.00	-	-	.13	-
B	Quercus gambelii	1.79	1.79	.91	.15	1.80	1.50	2.05
Total for Browse		4.21	3.73	4.25	1.39	4.67	6.32	3.21

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 7

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	47	36	49	-
Pinus edulis	15	25	30	-

Average diameter (in)			
'98	'03	'08	'13
5.4	4.5	5.5	-
4.1	3.3	4.4	-

BASIC COVER--

Management unit 22, Study no: 7

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	48.08	36.66	32.07	42.35
Rock	3.09	3.19	3.42	4.85
Pavement	21.02	25.52	33.02	12.81
Litter	50.48	32.25	33.37	37.40
Cryptogams	.05	.01	.08	0
Bare Ground	7.12	17.78	13.62	14.65

PELLET GROUP DATA--

Management unit 22, Study no: 7

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	6	14	91	3
Elk	1	-	3	14
Deer	4	4	12	10
Cattle	28	17	22	7

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	8 (20)	9 (23)
12 (30)	5 (13)	5 (12)	11 (26)
52 (128)	85 (210)	12 (30)	-

BROWSE CHARACTERISTICS--

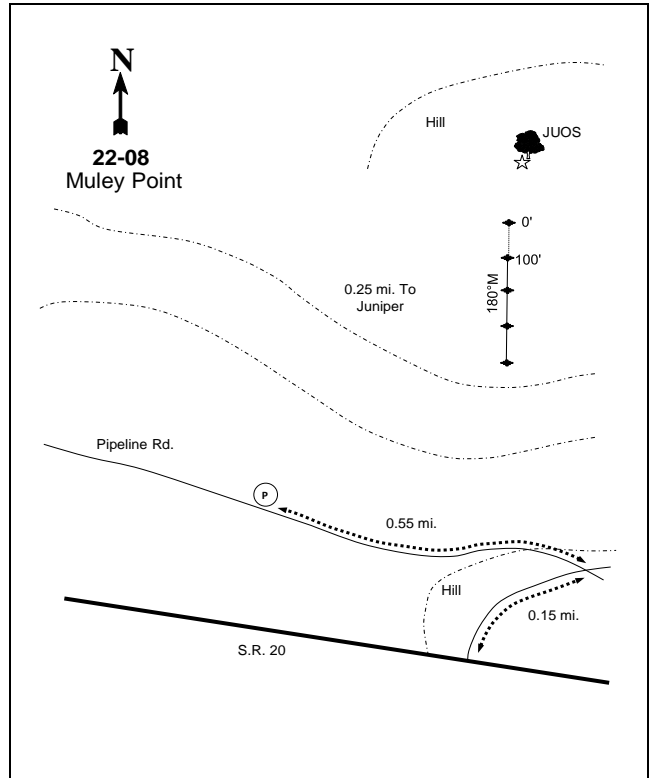
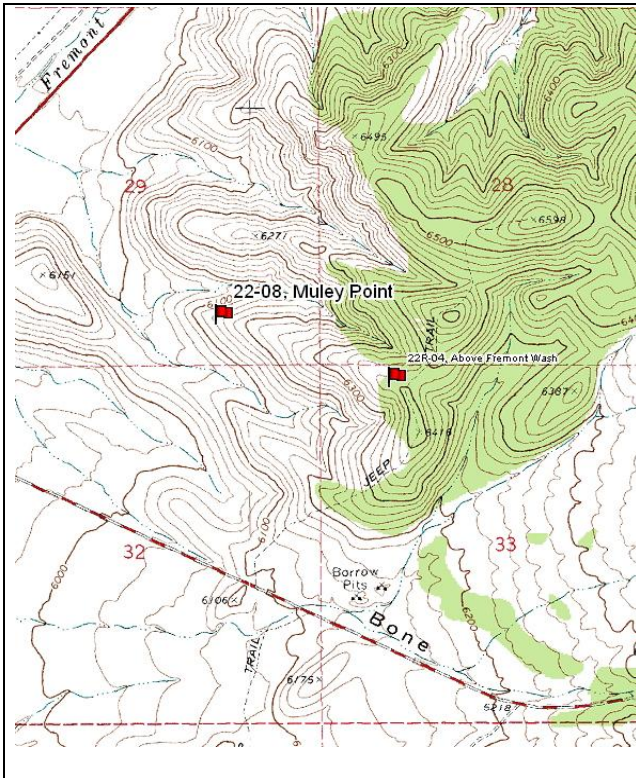
Management unit 22, Study no: 7

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
98	0	0	0	-	-	0	0	0	35/19
03	0	0	0	-	-	0	0	0	25/28
08	0	0	0	-	-	0	0	0	29/35
13	0	0	0	-	-	0	0	0	20/23
<b>Artemisia tridentata vaseyana</b>									
98	20	0	100	0	-	0	0	0	27/38
03	100	20	80	0	-	20	0	0	24/38
08	60	0	67	33	-	67	0	0	28/38
13	240	50	50	0	40	0	0	0	16/23
<b>Cercocarpus ledifolius</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	37/48
08	0	0	0	-	-	0	0	0	57/54
13	0	0	0	-	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Cercocarpus montanus</b>									
98	0	0	0	-	-	0	0	0	27/30
03	0	0	0	-	-	0	0	0	22/32
08	0	0	0	-	-	0	0	0	37/34
13	0	0	0	-	-	0	0	0	24/30
<b>Chrysothamnus nauseosus hololeucus</b>									
98	0	0	0	-	-	0	0	0	35/66
03	0	0	0	-	-	0	0	0	39/64
08	0	0	0	-	-	0	0	0	15/26
13	0	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	13/15
<b>Gutierrezia sarothrae</b>									
98	0	0	0	-	-	0	0	0	12/12
03	20	0	100	-	-	0	0	0	11/13
08	60	0	100	-	200	0	0	0	5/6
13	340	12	88	-	-	0	0	0	14/16
<b>Juniperus osteosperma</b>									
98	40	0	100	-	-	0	0	0	-/-
03	80	0	100	-	-	0	0	0	-/-
08	100	0	100	-	-	0	0	0	-/-
13	20	0	100	-	20	0	0	0	-/-
<b>Pediocactus simpsonii</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	20	0	0	0	-/-
<b>Pinus edulis</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Purshia tridentata</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	19/47
08	0	0	0	-	-	0	0	0	23/57
13	0	0	0	-	-	0	0	0	19/51

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Quercus gambelii</i>										
98	<b>380</b>	26	68	5	-	0	0	0	44/30	
03	<b>260</b>	0	100	0	-	0	0	0	56/30	
08	<b>320</b>	0	88	13	-	0	0	6	53/35	
13	<b>340</b>	100	0	0	-	0	0	0	15/15	

MULEY POINT - TREND STUDY NO. 22-8



**Location Information**

USGS 7.5 min Map Info      Buckhorn Flat; Township 31S, Range 7W, Section 29  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 353599 East 4215390 North

**Transect Information**

Browse Tag # (0' Stake)      7051  
 Transect Bearing              180° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

\*Private property must be crossed in order to access the site (call land owner for permission). From exit #95 on I-15 (junction with SR 20), go to the east side of the freeway, then go 1.2 miles east from the cattleguard on SR 20 to a small wooden H in the fence on the left. Go north through the gate for 0.15 miles to a 4-way intersection. Turn left on the pipeline road and go 0.55 miles then stop. On the ridge to the north locate the lowest juniper on the skyline. Walk to the juniper which is about 1/4 mile away. The baseline starts 10 feet south of the juniper. The 0-foot stake consists of a 3-foot rebar with browse tag #7051 attached.

**Site Information**

Land Ownership BLM  
 Allotment Bone Hollow  
 Elevation 6,200ft (1,890m)  
 Aspect Southwest  
 Slope 17-25%  
 Sample Dates 08/04/1985, 08/08/1991, 06/22/1998, 06/10/2003, 06/11/2008, 06/04/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 8

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Wildfire	Lee's Wash	-	2005	195
Seeding (Aerial)	-	-	2005	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 8

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-2003	Wyoming Big Sagebrush	Phase I
2008-2013	Annual Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The Above Fremont Wash (22R-4) transect is located about a half mile to the east and is a good comparison site as it was not burned. Deer pellet groups were sample in high abundance prior to the treatment, but after the fire, pellet group abundance was sampled in low abundance on the site (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Loamy, mixed, mesic, shallow Petrocalcic Palexerolls  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY220UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 8

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	52.0	27.4	20.6	7.3	0.6	1.3	5.8	156.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).



When established in 1985, the site was a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with a sparse herbaceous understory. Cheatgrass (*Bromus tectorum*) has been a major component on the site, though it has fluctuated over the sample years (Table - Herbaceous Trends). Following the fire in 2005, the site transitioned from a Wyoming big sagebrush dominated state to an introduced annual grass dominated state. Without treatment, this site will likely remain in an introduced annual grass state.

Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 22, study no: 8

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	18.5	3.9	5.5	9.1	-10.0	2.3	0.0	29.2	Fair
2003	18.5	3.3	0.5	9.4	-3.4	1.6	0.0	29.9	Fair
2008	2.9	0.0	0.0	1.7	-11.9	4.1	0.0	-3.2	Very Poor
2013	4.8	0.0	0.0	4.4	-18.6	4.9	0.0	-4.6	Very Poor

HERBACEOUS TRENDS--

Management unit 22, Study no: 8

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Aristida purpurea</i>	28	6	9	21	.32	.15	.21	.86
G	<i>Bromus tectorum</i> (a)	b419	a269	b406	c463	13.37	4.50	15.92	24.82
G	<i>Hilaria jamesii</i>	9	10	10	8	.19	.07	.16	.19
G	<i>Oryzopsis hymenoides</i>	bc80	c108	a35	ab51	2.42	3.81	.41	1.07
G	<i>Poa secunda</i>	-	-	7	-	-	-	.01	-
G	<i>Sitanion hystrix</i>	c95	b62	a8	a2	1.56	.63	.04	.03
G	<i>Stipa comata</i>	4	1	1	-	.04	.01	.01	.01
Total for Annual Grasses		419	269	406	463	13.37	4.50	15.92	24.82
Total for Perennial Grasses		216	187	70	82	4.54	4.68	0.86	2.18
Total for Grasses		635	456	476	545	17.91	9.18	16.78	27.01
F	<i>Astragalus calycosus</i>	-	-	4	-	-	-	.39	-
F	<i>Astragalus cibarius</i>	b19	ab2	a-	a-	.66	.01	-	-
F	<i>Astragalus lentiginosus</i>	-	-	2	-	-	-	.18	-
F	<i>Astragalus</i> sp.	a-	a-	b46	ab4	-	-	.49	.01
F	<i>Castilleja linariaefolia</i>	-	-	4	4	-	-	.03	.06
F	<i>Chaenactis douglasii</i>	4	-	-	-	.02	-	-	-
F	<i>Collinsia parviflora</i> (a)	-	-	5	-	-	-	.01	-
F	<i>Descurainia pinnata</i> (a)	a2	a3	a6	b14	.03	.01	.01	.13
F	<i>Eriogonum cernuum</i> (a)	a1	b42	b35	b59	.00	.37	.48	.48
F	<i>Erodium cicutarium</i> (a)	a-	ab1	ab3	b92	-	.00	.00	1.83
F	<i>Gilia</i> sp. (a)	a-	c28	b12	a-	-	.26	.05	-
F	<i>Holosteum umbellatum</i> (a)	-	3	-	3	-	.00	-	.01
F	<i>Leucelene ericoides</i>	10	13	4	9	.12	.37	.03	.21
F	<i>Lupinus</i> sp. (a)	a-	a-	b6	ab1	-	-	.04	.00
F	<i>Mentzelia</i> sp.	-	-	5	-	-	-	.01	-
F	<i>Oenothera caespitosa</i>	-	-	3	-	-	-	.00	-

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Phlox hoodii	-	1	-	-	-	.00	-	-
F	Phlox longifolia	4	4	1	4	.01	.01	.00	.01
F	Salsola iberica (a)	-	-	-	5	-	-	-	.03
F	Sisymbrium altissimum (a)	a <sup>-</sup>	a <sup>-</sup>	c <sup>173</sup>	b <sup>68</sup>	-	-	4.05	.46
F	Sphaeralcea coccinea	a <sup>21</sup>	a <sup>21</sup>	a <sup>20</sup>	b <sup>60</sup>	.31	.38	.87	2.18
Total for Annual Forbs		3	77	240	242	0.04	0.66	4.65	2.97
Total for Perennial Forbs		58	41	89	81	1.13	0.78	2.04	2.47
Total for Forbs		61	118	329	323	1.17	1.45	6.70	5.45

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

#### BROWSE TRENDS--

Management unit 22, Study no: 8

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'98	'03	'08
B	Artemisia tridentata wyomingensis	14.77	14.81	2.32	3.80	13.88	.96	1.38
B	Opuntia whipplei	.00	-	-	-	-	-	-
Total for Browse		14.78	14.81	2.32	3.80	13.88	.96	1.38

#### BASIC COVER--

Management unit 22, Study no: 8

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	33.02	28.21	29.24	43.04
Rock	17.64	17.90	11.86	11.40
Pavement	33.62	42.55	26.65	7.09
Litter	29.90	19.68	39.87	59.12
Cryptogams	.01	.22	.00	.03
Bare Ground	11.50	6.22	5.62	5.75

#### PELLET GROUP DATA--

Management unit 22, Study no: 8

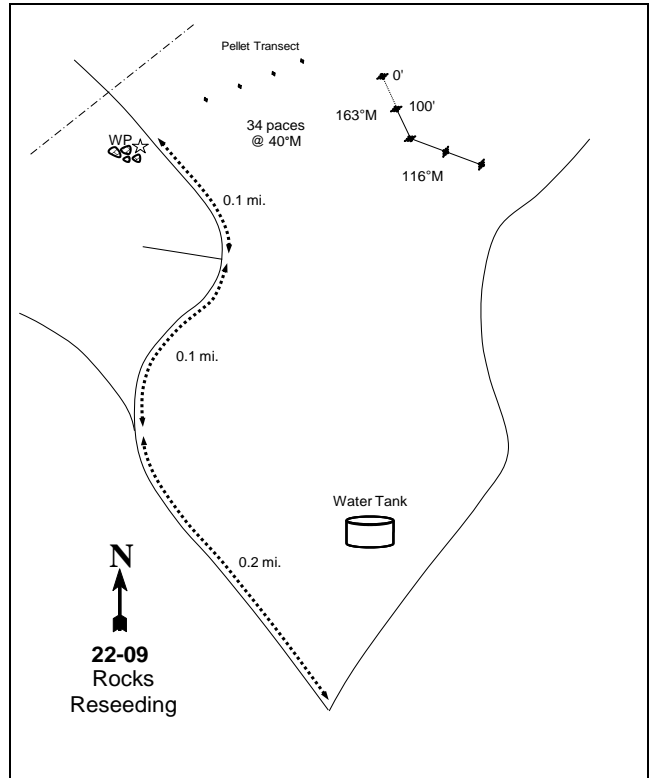
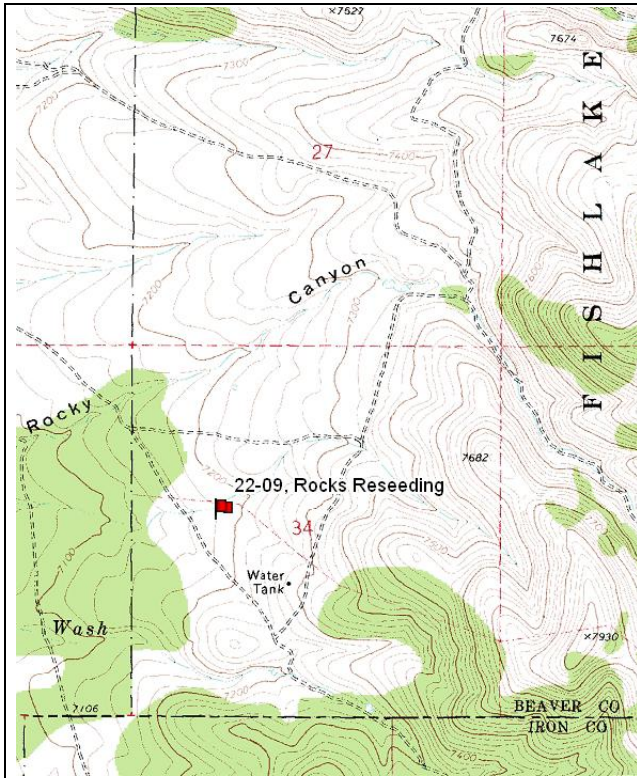
Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	29	14	86	11	-	-	-	-
Deer	53	18	9	16	80 (198)	83 (205)	3 (8)	3 (8)
Cattle	-	-	-	1	-	1 (2)	-	23 (57)

BROWSE CHARACTERISTICS--

Management unit 22, Study no: 8

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
98	3340	11	51	37	40	63	1	14	22/28	
03	3140	1	60	39	-	64	24	13	23/31	
08	360	11	72	17	-	83	0	6	19/23	
13	440	18	77	5	-	9	64	0	27/36	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	6/9	
08	20	0	100	-	-	0	0	0	4/6	
13	20	100	0	-	-	100	0	0	3/6	
<i>Coryphantha vivipara</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	11/24	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Echinocactus sp.</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	9/19	
<i>Juniperus osteosperma</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia whipplei</i>										
98	20	0	100	-	-	0	0	0	7/12	
03	0	0	0	-	-	0	0	0	5/12	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	7/22	

ROCKS RESEEDING - TREND STUDY NO. 22-9



**Location Information**

USGS 7.5 min Map Info Kane Canyon; Township 30S, Range 6W, Section 34  
 GPS (0' Stake) NAD 83, UTM Zone 12, 366401 East 4224123 North

**Transect Information**

Browse Tag # (0' Stake) 7050  
 Transect Bearing 163° magnetic (Lines 1-2), 116° magnetic (Lines 3-4)  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Begin on I-15 at exit #100, 9 miles south of Beaver. On the east side of the freeway there is a frontage road and a road going east. Go east 6.3 miles up Fremont Wash to a faint road to the left. Go 0.6 miles up the road which has several switchbacks to the top to a gate. Continue straight for 0.7 miles to a four-way intersection. Go straight 0.65 miles to a fork. Take the middle fork for 0.8 miles to a fork with 1002 and 1003. Go right for 1 mile on 1002 to a stock pond. Go up a steep hill 0.1 miles to a fork, turn left (1005), and go 0.2 miles to another fork. Stay right and go another 0.1 mile to a witness post on the left side of the road. The witness post marks the start of a pellet group transect. From the witness post, walk 34 paces at 41 degrees magnetic along the transect. There are small rebar every 30 feet. The baseline starts 10 feet south of the fifth small rebar (150 feet from the fencepost). The frequency baseline is marked by 2-3 foot rebar and the 0-foot stake is tagged #7050. The 200, 300 and 400 foot stakes are half-high fenceposts.

**Site Information**

Land Ownership USFS  
 Allotment South Beaver  
 Elevation 7,150ft (2,179m)  
 Aspect West  
 Slope 4-6%  
 Sample Dates 08/03/1985, 08/08/1991, 06/19/1998, 06/17/2003, 06/11/2008, 06/03/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 9

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Harrow	-	-	1962	-
Seeding	-	-	1962	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 9

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-1991	Mountain Big Sagebrush/Bitterbrush	Phase I
1998-2013	Mountain Big Sagebrush/Bitterbrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A water trough is located about one third of a mile from the site.

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY310UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 9

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	38.0	31.4	30.6	6.6	0.7	2.5	9.8	185.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1985, the site was a mixed stand of mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) with crested wheatgrass (*Agropyron cristatum*) being the dominant component of the herbaceous understory (Appendix B -Pre-1992 Data). Bitterbrush and sagebrush have remained in a stable state on the site over the sampled years (Table - Browse Trend, Table - Browse Characteristics). Native forb and grass species have been sparse on the site since the outset of the study (Table - Herbaceous Trends, Appendix B -Pre-1992 Data). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have remained a minor component of the site over the sample years, though cover and density have increased on the site (Table - Browse Characteristics, Table - Browse Trends). Without a

tree-removing disturbance, pinyon and juniper will likely continue to increase in abundance on the site and become the dominant component of the site.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 22, study no: 9

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	12.3	8.7	30.0	0.0	1.7	0.0	<b>82.7</b>	Excellent
2003	30.0	4.4	4.7	30.0	0.0	0.5	0.0	<b>69.7</b>	Good
2008	17.5	0.2	4.5	30.0	0.0	0.5	0.0	<b>52.7</b>	Fair
2013	16.5	11.0	6.8	30.0	0.0	1.3	0.0	<b>65.7</b>	Fair-Good

#### HERBACEOUS TRENDS--

Management unit 22, Study no: 9

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	b365	ab314	a297	ab334	22.16	15.03	18.07	23.31
G	Agropyron spicatum	11	3	-	2	.56	.02	-	.03
G	Aristida purpurea	2	1	-	-	.03	.03	-	-
G	Bouteloua gracilis	-	-	-	4	-	-	-	.18
G	Bromus tectorum (a)	-	1	1	3	-	.00	.00	.00
G	Hilaria jamesii	3	-	3	-	.03	-	.15	-
G	Koeleria cristata	-	4	-	-	-	.01	-	-
G	Oryzopsis hymenoides	1	1	3	-	.03	.03	.01	-
G	Poa fendleriana	3	1	-	1	.15	.00	-	.03
G	Poa secunda	a-	ab3	ab5	b11	-	.09	.04	.13
Total for Annual Grasses		0	1	1	3	0	0.00	0.00	0.00
Total for Perennial Grasses		385	327	308	352	22.96	15.22	18.27	23.68
Total for Grasses		385	328	309	355	22.96	15.22	18.28	23.68
F	Agoseris glauca	1	1	-	3	.03	.00	-	.03
F	Alyssum alyssoides (a)	a-	ab2	ab6	b125	-	.00	.01	.40
F	Arabis demissa	3	3	-	-	.00	.03	-	-
F	Astragalus convallarius	3	-	-	-	.15	-	-	-
F	Astragalus sp.	6	6	5	7	.33	.01	.03	.18
F	Calochortus nuttallii	-	4	-	-	-	.00	-	-
F	Chaenactis douglasii	-	1	-	-	-	.00	-	-
F	Collinsia parviflora (a)	a1	ab19	b26	b28	.00	.04	.06	.06
F	Crepis acuminata	-	1	3	1	-	.03	.01	.15
F	Cryptantha sp.	-	1	-	-	-	.00	-	-
F	Cymopterus sp.	a2	ab12	a9	b26	.01	.03	.04	.10
F	Delphinium nuttallianum	5	6	-	-	.04	.01	.00	-
F	Descurainia pinnata (a)	2	-	-	-	.00	-	-	-
F	Draba sp. (a)	2	2	-	-	.00	.00	-	-
F	Erigeron eatonii	-	-	4	-	-	-	.00	-

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Eriogonum racemosum	2	-	1	1	.03	-	.00	.03
F	Gayophytum ramosissimum(a)	-	5	3	-	-	.01	.00	-
F	Lactuca serriola (a)	1	-	-	-	.00	-	-	-
F	Lomatium sp.	ab <sup>4</sup>	a <sup>-</sup>	b <sup>8</sup>	ab <sup>2</sup>	.01	-	.05	.03
F	Microsteris gracilis (a)	ab <sup>9</sup>	c <sup>184</sup>	a <sup>4</sup>	b <sup>26</sup>	.02	1.64	.00	.06
F	Navarretia intertexta (a)	-	1	-	-	-	.00	-	-
F	Phlox longifolia	33	31	35	28	.18	.11	.09	.12
F	Ranunculus testiculatus (a)	a <sup>-</sup>	ab <sup>9</sup>	b <sup>7</sup>	c <sup>34</sup>	-	.01	.02	.06
F	Trifolium sp.	-	1	-	-	-	.00	-	-
F	Vicia americana	3	-	-	-	.03	-	-	-
F	Zigadenus paniculatus	3	-	1	-	.00	-	.03	-
Total for Annual Forbs		15	222	46	213	0.04	1.71	0.11	0.58
Total for Perennial Forbs		65	67	66	68	0.84	0.27	0.26	0.66
Total for Forbs		80	289	112	281	0.88	1.99	0.38	1.25

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

#### BROWSE TRENDS--

Management unit 22, Study no: 9

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	14.66	12.76	6.44	4.80	13.66	9.45	14.51
B	Cowania mexicana stansburiana	-	-	-	2.75	-	-	5.03
B	Juniperus osteosperma	.15	.48	1.49	1.45	2.05	3.86	4.90
B	Pinus edulis	-	.15	-	-	.16	-	-
B	Purshia tridentata	12.26	9.76	6.33	4.25	10.83	10.83	12.98
Total for Browse		27.07	23.15	14.26	13.25	26.7	24.14	37.42

#### POINT-QUARTER TREE DATA--

Management unit 22, Study no: 9

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	54	60	65	68

Average diameter (in)			
'98	'03	'08	'13
4.8	4.6	5.5	7.2

BASIC COVER--

Management unit 22, Study no: 9

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	39.93	40.48	36.46	38.48
Rock	11.52	10.52	9.96	8.59
Pavement	11.13	9.10	14.43	8.69
Litter	42.81	27.09	35.18	47.36
Cryptogams	.45	.15	.40	.12
Bare Ground	21.23	30.41	21.18	16.15

PELLET GROUP DATA--

Management unit 22, Study no: 9

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	23	4	80	1	-	-	-	-
Elk	2	-	2	2	1 (2)	6 (15)	-	5 (12)
Deer	21	7	16	6	18 (45)	23 (56)	19 (48)	15 (36)
Cattle	18	9	7	1	20 (49)	19 (47)	32 (79)	28 (70)

BROWSE CHARACTERISTICS--

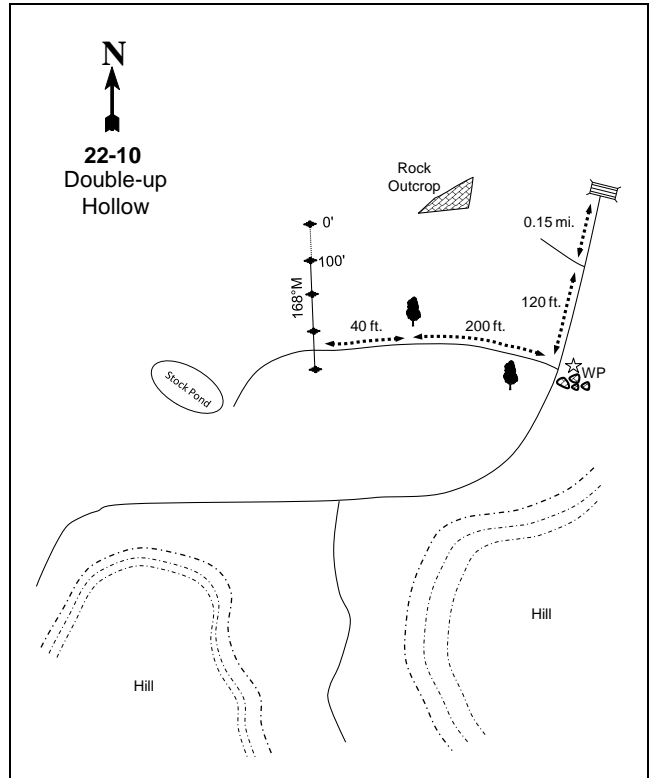
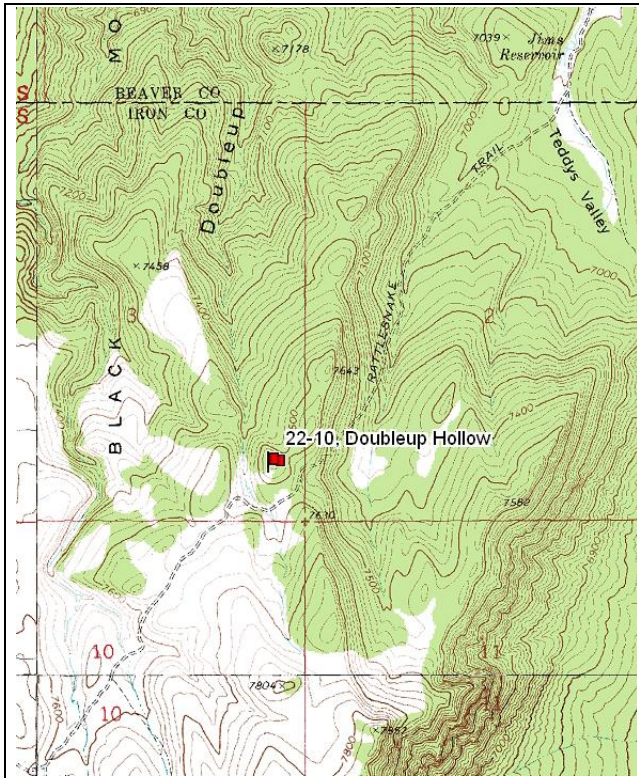
Management unit 22, Study no: 9

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia tridentata vaseyana</i>									
98	<b>3420</b>	26	65	8	340	18	1	2	27/37
03	<b>2880</b>	12	71	17	20	21	8	3	25/31
08	<b>3140</b>	13	41	46	60	37	14	31	19/29
13	<b>2540</b>	11	72	17	60	35	9	12	25/35
<i>Cowania mexicana stansburiana</i>									
98	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>0</b>	0	0	0	-	0	0	0	-/-
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>280</b>	7	71	21	-	93	0	14	41/62
<i>Juniperus osteosperma</i>									
98	<b>100</b>	60	40	-	20	0	0	0	-/-
03	<b>100</b>	40	60	-	-	0	0	0	-/-
08	<b>100</b>	60	40	-	20	0	20	20	-/-
13	<b>120</b>	33	67	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	4/2
13	<b>0</b>	0	0	-	-	0	0	0	-/-



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Opuntia whipplei</i>										
98	<b>0</b>	0	0	-	-	0	0	0	6/8	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Pinus edulis</i>										
98	<b>20</b>	100	0	-	-	0	0	0	-/-	
03	<b>20</b>	100	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	100	0	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
98	<b>1440</b>	7	83	10	100	57	3	0	41/53	
03	<b>1080</b>	6	35	59	20	22	76	13	38/47	
08	<b>1140</b>	5	42	53	100	42	37	19	42/51	
13	<b>960</b>	21	75	4	80	31	2	2	47/59	
<i>Ribes sp.</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	26/39	

DOUBLEUP HOLLOW - TREND STUDY NO. 22-10



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Greenville Bench; Township 31S, Range 8W, Section 3  
NAD 83, UTM Zone 12, 347594 East 4222016 North

**Transect Information**

Browse Tag # (0' Stake)	7075
Transect Bearing	168° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)
Belt Marker Placement	Standard

**Directions to Site**

Start from the cattleguard in front of the Chevron station on the west side of the I-15 interchange at the south end of Beaver. Turn left onto the frontage road (2550 S) and go 0.7 miles south, then 1.6 miles west. Go past the turnoff to the Beaver International Airport for 0.2 miles to a corner and then 0.2 miles south to an intersection. Turn right, (paralleling a fenceline) and proceed 1.7 miles west to an intersection. Turn left onto a major dirt road and follow this main road (also known as the Rattlesnake Trail) for 6.7 miles, keeping to the right at all forks. From the junction, go 1.65 miles to the cattleguard. Continue 0.15 miles to a half high fencepost marked by a rock pile. From the half high post to the 0' stake, go 72 paces at 310 degrees. The 300 ft stake is rebar and tagged #7075.

**Site Information**

Land Ownership BLM  
 Allotment Bald Hills  
 Elevation 7,620ft (2,323m)  
 Aspect South  
 Slope 10-15%  
 Sample Dates 08/14/1985, 08/08/1991, 06/24/1998, 06/16/2003, 06/04/2008, 05/29/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 10

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Wildfire	Greenville Bench	-	2007	14,716
Seeding (Aerial)	Greenville Bench Aerial Seeding	<a href="#">993</a>	2007	4,030

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 22, Study no: 10

Project Name: Greenville Bench Mix #2		
WRI Database #: <a href="#">993</a>		
Application: Aerial Seed	Acres 4030	
Seed Type	lbs in mix	lbs/acre
G †Bluebunch Wheatgrass 'P-7'	3250	0.81
G *†Bottlebrush Squirreltail 'Toe Jam'	1300	0.32
G †Canby Bluegrass 'Canbar'	1750	0.43
G †Crested Wheatgrass 'Hycrest'	4050	1.00
G *Indian Ricegrass	1250	0.31
G *Intermediate Wheatgrass 'Rush'	1050	0.26
G †Orchardgrass 'Paiute'	3900	0.97
G *†Pubescent Wheatgrass 'Luna'	5050	1.25
G *Russian Wildrye	150	0.04
G *Sand Dropseed	150	0.04
G *Thickspike Wheatgrass 'Bannock'	850	0.21
G *†Western Wheatgrass 'Arriba'	3850	0.96
F *†Alfalfa 'Ladak'	3650	0.91
F †Blue Flax 'Maple Grove'	824	0.20
F *Blue Flax	100	0.02
F *Gooseberryleaf Globemallow	40	0.01
F *†Palmer Penstemon	287	0.07
F †Sainfoin 'Eski'	8100	2.01
F *†Small Burnet 'Delar'	10500	2.61
F *Western Yarrow	100	0.02
F *†Yellow Sweetclover	4000	0.99
B *Fourwing Saltbush	150	0.04
**SITLA MIX	540	0.13
Total Pounds	54891	13.62

\* Seed provided by BLM and mixed by GBRC

\*\* Seed provided by SITLA and mixed by GBRC

† Seed provided by UDWR to augment BLM/SITLA seed mix

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Sage-Grouse Habitat Not Winter, Nesting and Brood-Rearing

VEGETATION HISTORY--

Management unit 22, Study no: 10

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2003	Mountain Big Sagebrush/Bitterbrush/Pinyon-Juniper	Phase I transitioning to Phase II
2008-2013	Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The site burned in 2007 as part of the Greenville Bench prescribed fire that went out of control.

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed, frigid Pachic Argixerolls  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY310UT

SOIL ANALYSIS DATA--

Management unit 22, Study no: 10

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	44.0	27.4	28.6	6.6	0.8	2.7	7.1	204.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1985, the site was a mixed stand of mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) with limited herbaceous understory (Appendix B -Pre-1992 Data). Bitterbrush and sagebrush remained relatively stable on the site until the fire in 2007, which removed nearly all the shrubs on the site. Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) were a major component of the site prior to the fire, but were removed from the site by the fire (Table - Browse Trend, Table - Browse Characteristics). The site was seeded with a diverse seed mix of native and introduced plant species. The major component of the site following the fire consisted of mixture of seeded introduced and native forb/grass species and is considered to have transitioned to an introduced perennial grass and forb community. Cheatgrass has varied in nested frequency since 1998 and was considered high in cover and frequency in 2013.

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 22, study no: 10

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	9.7	3.3	5.0	-1.3	4.4	0.0	<b>51.0</b>	Poor-Fair
2003	30.0	6.0	2.4	3.1	-1.1	0.7	0.0	<b>41.1</b>	Poor
2008	0.0	0.0	0.0	0.1	0.0	0.2	0.0	<b>0.3</b>	Very Poor
2013	0.2	0.0	0.0	30.0	-4.5	10.0	0.0	<b>35.7</b>	Very Poor-Poor

HERBACEOUS TRENDS--  
Management unit 22, Study no: 10

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	a-	a-	a-	b28	-	-	-	.99
G	Agropyron dasystachyum	a-	a-	a-	b29	-	-	-	.73
G	Agropyron intermedium	a-	a-	a-	b172	-	-	-	10.65
G	Agropyron spicatum	b20	ab9	a-	c59	.35	.16	-	2.64
G	Bouteloua gracilis	7	-	1	2	.01	-	.03	.15
G	Bromus anomalus	-	-	-	3	-	-	-	.38
G	Bromus tectorum (a)	c105	b70	a6	d355	1.78	.68	.06	6.02
G	Carex sp.	b19	ab14	a-	ab10	.26	.21	-	.33
G	Dactylis glomerata	a-	a-	a-	b35	-	-	-	.89
G	Koeleria cristata	ab3	b11	ab1	a-	.00	.07	.03	-
G	Oryzopsis hymenoides	a10	a-	a-	b35	.02	-	-	.56
G	Poa fendleriana	11	4	2	3	.30	.06	.00	.01
G	Poa secunda	-	-	-	2	-	.00	-	.01
G	Sitanion hystrix	b84	b70	a-	b85	1.53	1.01	-	3.75
G	Sporobolus cryptandrus	-	-	-	1	-	-	-	.03
G	Vulpia octoflora (a)	-	-	-	2	-	-	-	.00
Total for Annual Grasses		105	70	6	357	1.78	0.68	0.06	6.03
Total for Perennial Grasses		154	108	4	464	2.49	1.53	0.06	21.14
Total for Grasses		259	178	10	821	4.27	2.21	0.12	27.17
F	Achillea millefolium	-	-	-	8	-	-	-	.39
F	Arabis demissa	b14	a3	a-	a-	.05	.00	-	-
F	Astragalus newberryi	1	1	-	-	.00	.00	-	-
F	Calochortus nuttallii	-	-	3	-	-	-	.03	-
F	Chaenactis douglasii	b6	a-	a-	ab3	.07	-	-	.01
F	Chenopodium album (a)	-	-	1	-	-	-	.00	-
F	Cirsium sp.	a-	a-	a-	b10	-	-	-	.08
F	Collinsia parviflora (a)	-	-	6	-	-	-	.01	-
F	Cryptantha sp.	b12	a1	a-	a1	.08	.00	-	.03
F	Cymopterus sp.	7	4	-	1	.01	.03	.00	.01
F	Descurainia pinnata (a)	3	10	-	-	.00	.19	-	-
F	Dracocephalum parviflorum	-	-	-	3	-	-	-	.01
F	Epilobium brachycarpum (a)	b9	a-	a-	a-	.05	-	-	-
F	Erigeron pumilus	4	-	-	2	.06	-	-	.00
F	Eriogonum umbellatum	-	3	-	-	-	.03	-	-
F	Gayophytum ramosissimum(a)	a-	b36	a-	a-	-	.09	-	-
F	Lactuca serriola (a)	-	-	-	7	-	-	-	.02
F	Lappula occidentalis (a)	a-	a-	a-	b13	-	-	-	.03
F	Linum perenne	a-	a-	a-	b14	-	-	-	.11
F	Lupinus argenteus	b25	a-	a-	b25	1.44	-	.01	.62
F	Lygodesmia spinosa	-	2	-	6	-	.00	-	.18
F	Machaeranthera canescens	a4	a-	a-	b121	.01	-	-	5.26
F	Medicago sativa	a-	a-	a-	b37	-	-	-	4.60

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Melilotus officinalis	-	-	-	1	-	-	-	.00
F	Microsteris gracilis (a)	7	-	-	3	.01	-	-	.00
F	Oenothera caespitosa	-	-	-	1	-	-	-	.15
F	Penstemon sp.	4	6	4	-	.04	.21	.01	-
F	Petradoria pumila	4	1	-	2	.38	.03	-	.03
F	Phlox longifolia	2	3	1	-	.01	.03	.00	-
F	Ranunculus testiculatus (a)	-	-	-	2	-	-	-	.00
F	Sanguisorba minor	-	-	-	7	-	-	-	.06
F	Senecio multilobatus	a <sup>-</sup>	a <sup>-</sup>	a <sup>1</sup>	b <sup>52</sup>	-	-	.03	1.14
F	Sisymbrium altissimum (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>9</sup>	-	-	-	.03
F	Sphaeralcea grossulariifolia	-	-	-	4	-	-	-	.00
F	Taraxacum officinale	-	-	-	5	-	-	-	.04
F	Tragopogon dubius (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>34</sup>	-	-	-	.57
Total for Annual Forbs		19	46	7	68	0.06	0.28	0.02	0.67
Total for Perennial Forbs		83	24	9	303	2.18	0.36	0.09	12.76
Total for Forbs		102	70	16	371	2.25	0.64	0.11	13.43

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

#### BROWSE TRENDS--

Management unit 22, Study no: 10

Type	Species	Average Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	.03	-	-	-	-	-	-
B	Artemisia tridentata vaseyana	23.74	16.68	-	.15	13.88	-	-
B	Cercocarpus ledifolius	.41	.41	-	-	.35	-	-
B	Gutierrezia sarothrae	-	.00	.00	.58	-	-	.20
B	Juniperus osteosperma	1.70	.38	-	-	2.09	-	-
B	Mahonia repens	.01	.03	-	.00	-	-	.08
B	Opuntia sp.	-	-	.15	.06	-	-	.25
B	Pinus edulis	6.10	11.07	-	-	11.30	-	-
B	Purshia tridentata	13.92	11.08	-	-	11.96	-	-
B	Symphoricarpos oreophilus	1.29	1.16	.03	.07	1.25	-	.90
Total for Browse		47.20	40.82	0.19	0.88	40.83	0.00	1.43

#### POINT-QUARTER TREE DATA--

Management unit 22, Study no: 10

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	26	28	<18	<18
Pinus edulis	125	132	<18	<18

Average diameter (in)			
'98	'03	'08	'13
4.5	5.4	-	-
4.3	5.4	-	-

**BASIC COVER--**

Management unit 22, Study no: 10

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	45.72	40.59	.44	44.37
Rock	12.25	10.68	20.08	15.52
Pavement	20.12	13.58	61.05	13.17
Litter	49.04	51.86	6.18	40.92
Cryptogams	.19	.45	.88	0
Bare Ground	6.00	7.14	20.52	5.54

**PELLET GROUP DATA--**

Management unit 22, Study no: 10

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	27	20	9	5	-	-	-	-
Elk	2	-	-	-	-	-	-	-
Deer	36	8	-	1	18 (44)	29 (71)	-	6 (15)
Cattle	-	-	1	3	-	-	-	7 (18)

**BROWSE CHARACTERISTICS--**

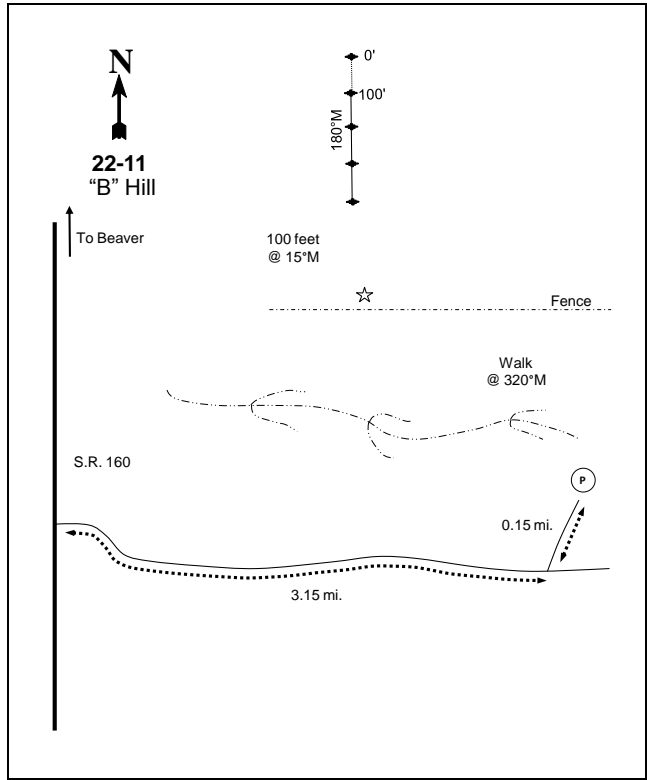
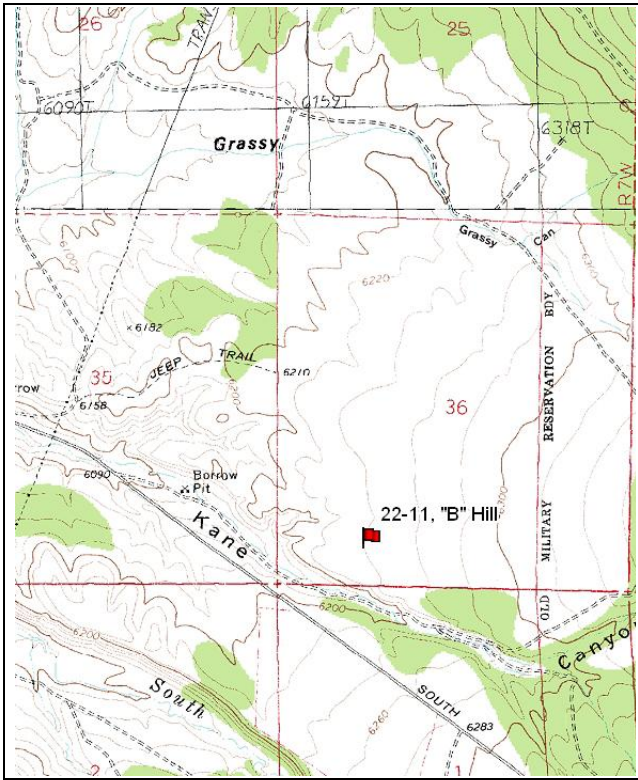
Management unit 22, Study no: 10

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Artemisia nova</b>									
98	120	0	50	50	-	0	0	33	10/13
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-
<b>Artemisia tridentata vaseyana</b>									
98	3900	3	72	25	220	22	0	11	22/30
03	4100	1	59	40	-	22	3	14	24/28
08	0	0	0	0	-	0	0	0	-/-
13	40	50	50	0	20	50	0	0	15/28
<b>Cercocarpus ledifolius</b>									
98	20	0	100	-	-	0	0	0	48/53
03	40	50	50	-	-	0	0	0	55/52
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Gutierrezia sarothrae</b>									
98	20	100	0	-	-	0	0	0	-/-
03	100	0	100	-	-	0	0	0	9/10
08	0	0	0	-	20	0	0	0	-/-
13	140	14	86	-	220	0	0	0	8/11

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Juniperus osteosperma</b>										
98	40	50	50	-	-	0	0	0	-/-	
03	40	50	50	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Mahonia repens</b>										
98	120	17	83	0	-	0	0	0	-/-	
03	140	0	100	0	-	0	0	0	3/6	
08	120	67	0	33	-	0	0	0	-/-	
13	100	20	80	0	-	0	0	0	3/4	
<b>Opuntia sp.</b>										
98	80	25	75	0	-	0	0	0	5/14	
03	140	0	57	43	-	0	0	43	7/13	
08	160	38	63	0	-	0	0	0	5/9	
13	60	0	100	0	-	0	0	0	4/11	
<b>Pediocactus simpsonii</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	4/4	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Pinus edulis</b>										
98	60	100	0	-	-	0	0	0	-/-	
03	100	60	40	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Purshia tridentata</b>										
98	1540	13	82	5	180	32	1	1	34/45	
03	1360	9	75	16	-	28	3	6	34/50	
08	0	0	0	0	20	0	0	0	-/-	
13	20	0	100	0	-	100	0	0	17/32	
<b>Quercus gambelii</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	34/26	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	24/24	
<b>Symphoricarpos oreophilus</b>										
98	160	0	100	-	-	13	0	0	12/25	
03	260	46	54	-	-	38	0	0	22/43	
08	100	100	0	-	-	60	0	0	-/-	
13	120	50	50	-	-	0	0	0	14/29	



**'B' HILL - TREND STUDY NO. 22-11**



**Location Information**

USGS 7.5 min Map Info Kane Canyon; Township 29S, Range 7W, Section 36  
 GPS (0' Stake) NAD 83, UTM Zone 12, 360145 East 4233275 North

**Transect Information**

Browse Tag # (0' Stake) 7059  
 Transect Bearing 180° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Starting from Beaver High School on Main Street, go south 1.6 miles. On the east side of the road there is a rock monument commemorating the "Lee's Ranch Indian Raid". Turn east at the monument onto South Creek Road. Go 3.15 miles up South Creek Road and stay on the main road. Turn left and go down to the bottom of the wash where it meets another road. From this intersection, walk up the hill to the north at 320 degrees magnetic to the wooden cross braces. From the left wood post, go 100 feet at 15 degrees magnetic to the 400 foot stake. The study is marked by 2 ½ foot rebar that are 100 feet apart. The 0-foot baseline stake is marked by a short rebar tagged #7059.

**Site Information**

Land Ownership UDWR  
 WMA Name Beaver WMA  
 Elevation 6,220ft (1,896m)  
 Aspect West  
 Slope 1%  
 Sample Dates 08/04/1985, 08/09/1991, 06/12/1998, 06/17/2003, 06/02/2008, 05/29/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 11

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1959	-
Seeding	-	-	1959	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 11

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985 1991	Perennial Grass	Phase I
1998-2013	Wyoming Big Sagebrush/Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The wash just to the south of the study area contains an open stand of Utah juniper (*Juniperus osteosperma*) and provides the only cover near the flat. The site is nearly level with only a slight slope. Historic pellet group data from 1976-1997 is available from the “B” Hill pellet group transect that samples a slightly higher elevation area near the study site (Jense, et al., 1985; Jense, et al., 1991; Evans, et al., 1997).

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Coarse-loamy, mixed, mesic Aridic Petrocalcic Palexerolls  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY220UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 11

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	52.0	23.4	24.6	7.1	0.8	1.9	4.6	211.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1985, the major component of the site was introduced perennial grass species with a scattered population of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (Appendix B -Pre-1992 Data). Native herbaceous plants have been rare on the site over the sample years (Table - Herbaceous Trends). Since 1998, Wyoming big sagebrush has remained similar in size and cover on the site (Table -

Browse Trends). It is expected that without disturbance sagebrush will likely continue to increase and become dominant on the site.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 22, study no: 11

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	3.8	0.0	0.0	30.0	-0.3	1.7	0.0	<b>35.2</b>	Fair
2003	3.9	0.0	0.0	30.0	0.0	0.9	0.0	<b>34.8</b>	Fair
2008	4.2	0.0	0.0	30.0	0.0	1.2	0.0	<b>35.4</b>	Fair
2013	4.4	0.0	0.0	30.0	0.0	1.7	0.0	<b>36.1</b>	Fair

#### HERBACEOUS TRENDS--

Management unit 22, Study no: 11

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	b <sub>245</sub>	ab <sub>238</sub>	ab <sub>227</sub>	a <sub>213</sub>	18.53	11.03	11.27	10.60
G	Agropyron intermedium	c <sub>39</sub>	a <sub>4</sub>	bc <sub>23</sub>	ab <sub>6</sub>	.38	.15	.30	.06
G	Agropyron smithii	c <sub>44</sub>	bc <sub>42</sub>	a <sub>14</sub>	ab <sub>23</sub>	.53	.33	.03	.25
G	Bromus tectorum (a)	b <sub>18</sub>	ab <sub>2</sub>	a <sup>-</sup>	a <sup>-</sup>	.45	.00	-	-
G	Elymus junceus	a <sub>107</sub>	ab <sub>140</sub>	bc <sub>167</sub>	c <sub>218</sub>	3.58	6.71	8.91	10.79
G	Oryzopsis hymenoides	15	11	12	20	.58	.45	1.01	.61
G	Poa fendleriana	ab <sub>4</sub>	a <sup>-</sup>	b <sub>14</sub>	a <sup>-</sup>	.03	-	.10	-
G	Sitanion hystrix	2	-	4	1	.00	-	.01	.00
G	Stipa comata	a <sub>4</sub>	a <sub>6</sub>	a <sub>5</sub>	b <sub>44</sub>	.18	.31	.06	1.51
Total for Annual Grasses		18	2	0	0	0.45	0.00	0	0
Total for Perennial Grasses		460	441	466	525	23.84	18.98	21.70	23.85
Total for Grasses		478	443	466	525	24.29	18.99	21.70	23.85
F	Alyssum alyssoides (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sub>16</sub>	-	-	-	.03
F	Astragalus cibarius	b <sub>8</sub>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.13	-	-	-
F	Astragalus lentiginosus	-	-	-	5	-	-	-	.00
F	Castilleja chromosa	-	-	-	2	-	-	-	.00
F	Cymopterus sp.	1	-	-	3	.00	-	-	.00
F	Descurainia pinnata (a)	-	5	-	-	-	.04	-	-
F	Gilia sp. (a)	-	1	-	4	-	.00	-	.00
F	Leucelene ericoides	b <sub>33</sub>	a <sub>14</sub>	a <sub>3</sub>	a <sub>11</sub>	.29	.11	.01	.05
F	Orobancha fasciculata	1	-	-	1	.00	-	-	.00
F	Phlox hoodii	-	-	-	2	-	-	-	.15
F	Phlox longifolia	a <sub>3</sub>	a <sup>-</sup>	ab <sub>10</sub>	b <sub>23</sub>	.01	-	.04	.05
F	Ranunculus testiculatus (a)	a <sub>18</sub>	a <sub>2</sub>	a <sub>28</sub>	b <sub>260</sub>	.03	.00	.04	1.06
F	Schoenrambe linifolia	2	-	1	-	.00	-	.00	-
F	Sisymbrium altissimum (a)	2	2	-	-	.03	.00	-	-
F	Sphaeralcea coccinea	60	50	45	60	.41	.33	.53	.59

Type	Species	Nestled Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
	Total for Annual Forbs	20	10	28	280	0.06	0.06	0.04	1.10
	Total for Perennial Forbs	108	64	59	107	0.86	0.45	0.59	0.86
	Total for Forbs	128	74	87	387	0.92	0.51	0.63	1.96

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

#### BROWSE TRENDS--

Management unit 22, Study no: 11

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata wyomingensis</i>	3.06	3.06	3.22	3.39	2.28	2.36	3.21
B	<i>Ephedra nevadensis</i>	-	.03	.15	.15	-	-	-
B	<i>Gutierrezia sarothrae</i>	.03	-	.03	.00	-	.06	.20
B	<i>Opuntia sp.</i>					.01	.03	.06
	Total for Browse	3.09	3.09	3.40	3.55	2.29	2.45	3.47

#### BASIC COVER--

Management unit 22, Study no: 11

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	36.55	23.73	27.71	30.53
Rock	6.62	5.07	3.91	6.45
Pavement	12.07	32.39	32.18	22.20
Litter	22.31	18.15	23.24	18.51
Cryptogams	7.95	1.96	2.17	6.49
Bare Ground	29.41	27.14	23.93	26.76

#### PELLET GROUP DATA--

Management unit 22, Study no: 11

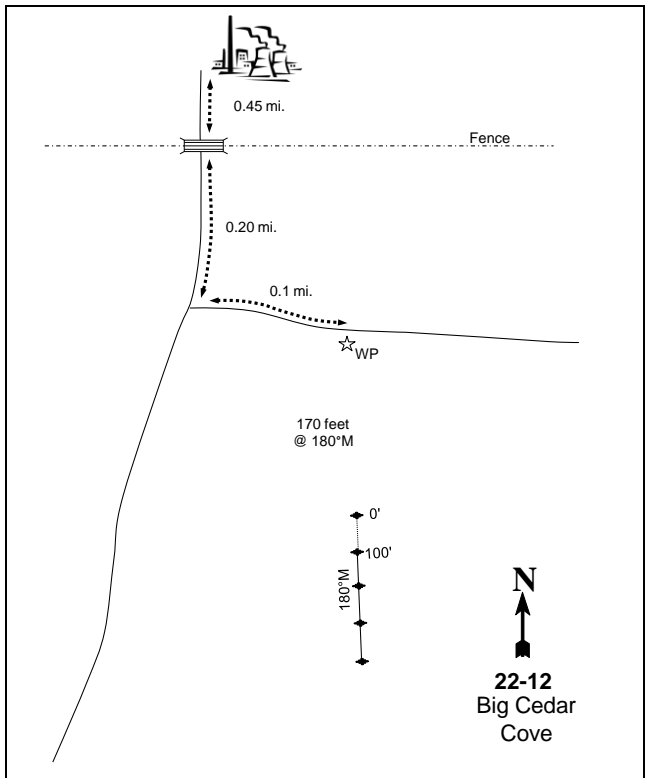
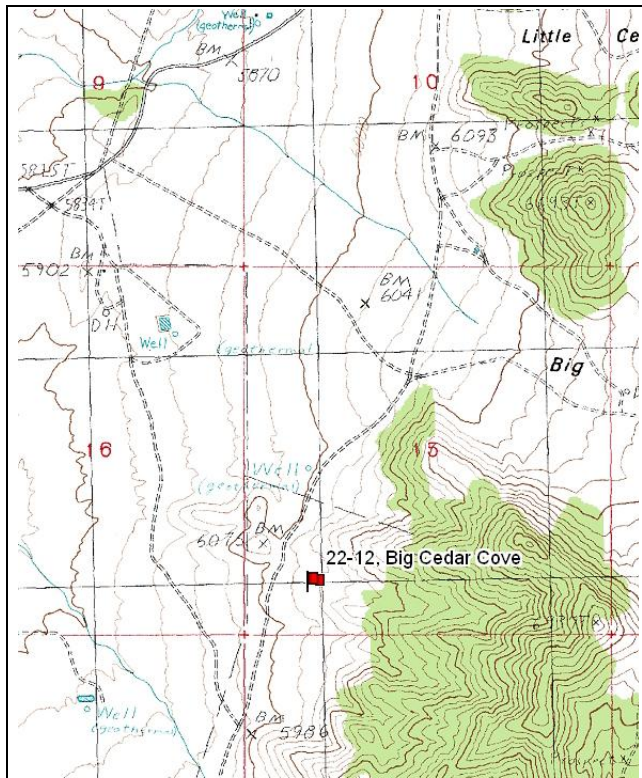
Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	16	10	94	34
Deer	20	8	11	5
Cattle	2	1	2	4

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
5 (12)	14 (35)	13 (33)	5 (13)
13 (32)	4 (9)	-	15 (38)

BROWSE CHARACTERISTICS--  
Management unit 22, Study no: 11

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
98	1200	20	58	22	20	13	18	13	18/31	
03	1040	4	56	40	-	31	35	15	21/29	
08	860	2	67	30	100	40	9	12	22/31	
13	1040	4	79	17	20	48	10	8	21/31	
<i>Ephedra nevadensis</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	11/8	
08	20	0	100	-	-	100	0	0	13/8	
13	20	0	100	-	-	100	0	0	14/12	
<i>Gutierrezia sarothrae</i>										
98	120	17	83	-	-	0	0	0	8/9	
03	0	0	0	-	-	0	0	0	-/-	
08	20	0	100	-	20	0	0	0	5/6	
13	20	0	100	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	3/2	
08	60	33	67	-	20	0	0	0	4/6	
13	20	0	100	-	-	0	0	0	4/10	
<i>Purshia tridentata</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	28/57	
08	0	0	0	-	-	0	0	0	23/50	
13	0	0	0	-	-	0	0	0	52/100	
<i>Rhus trilobata</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	28/51	

BIG CEDAR COVE - TREND STUDY NO. 22-12



**Location Information**

USGS 7.5 min Map Info      Bearskin Mountain; Township 27 S, Range 9 W, Section 15  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 337870 East 4258163 North

**Transect Information**

Browse Tag # (0' Stake)      7079  
 Transect Bearing              180° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement       Standard

**Directions to Site**

From mile marker 4 on SR 257 north of Milford, go 0.4 miles north. Turn right at Roosevelt Hot Springs Road (Blundell Geothermal Plant) and drive 2.65 miles to a major fork. Continue straight and go 5.0 miles. Just across the cattleguard turn right and go 1.0 miles to a 4-way fork. Turn right and continue 0.45 miles (past Phillips Oil well-head on the right) to another cattleguard. Go another 0.20 miles to a junction. Turn left and drive 0.1 miles to a witness post. The transect starts 170 feet south of the road. The 0-foot baseline stake is a steel rebar three feet tall with a browse tag #7079 attached.

**Site Information**

Land Ownership BLM  
 Allotment Mineral Range  
 Elevation 6,050ft (1,844m)  
 Aspect Southwest  
 Slope 6-9%  
 Sample Dates 08/05/1985, 07/30/1991, 06/17/1998, 06/24/2003, 06/09/2008, 06/05/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 12

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	Milford Flat	-	2007	356,665
Chaining	Milford Flat Fire Rehabilitation and Contracting	<a href="#">1218</a>	Fall 2007	76,454
Seeding Before	Milford Flat Fire Rehabilitation and Contracting	<a href="#">1218</a>	Fall 2007	76,454
Seeding After	Milford Flat Fire Rehabilitation and Contracting	<a href="#">1218</a>	Fall 2007	76,454

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 22, Study no: 12

Project Name: Milford BLM Mix 2 WRI Database #: <a href="#">1218</a>				Project Name: Milford BLM Mix 2 Wyoming Sage WRI Database #: <a href="#">1218</a>			
Application: Aerial Seed		Acres	12917	Application: Aerial Seed		Acres	7100
Seed Type		lbs in mix	lbs/acre	Seed Type		lbs in mix	lbs/acre
G	Crested Wheatgrass 'Hycrest'	26500	2.05	F	Alfalfa 'Ladak'	3550	0.50
G	Indian Ricegrass 'Rimrock'	10850	0.84	B	Sagebrush, Wyoming	3550	0.50
G	Intermediate Wheatgrass 'Rush'	10150	0.79	Total Pounds		7100	1.00
G	Pubescent Wheatgrass 'Luna'	16100	1.25	PLS Pounds			0.55
G	Siberian Wheatgrass 'P-27'	1200	0.09				
G	Siberian Wheatgrass 'Vavilov'	1500	0.12				
G	Thickspike Wheatgrass 'Bannock'	16350	1.27				
F	Alfalfa 'Ladak'	7150	0.55				
F	Blue Flax 'Appar'	3600	0.28				
F	Sainfoin 'Eski'	2200	0.17				
F	Small Burnett 'Delar'	19550	1.51				
F	Western Wheatgrass 'Arriba'	20400	1.58				
Total Pounds		135550	10.49				

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Pronghorn Crucial Year-Long

**VEGETATION HISTORY--**

Management unit 22, Study no: 12

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2003	Wyoming Big Sagebrush	Phase I
2008-2013	Annual-Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Fire rehabilitation efforts in the fall of 2007 included aerial seeding with a mixture of grasses and forbs, followed by a chaining with an Ely chain to cover the seed. After chaining was completed, Wyoming big

sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) was aerielly seeded. This study site was close to the border of the mid elevation mix 2 and the low elevation mix 3. Forage kochia (*Kochia prostrata*) was flown onto the low elevation area. There was likely some overlap of seeding in this area as kochia was sampled in 2008.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Fine, montmorillonitic, frigid Mollic Haploxeralfs  
 NRCS Ecological Site [Upland Gravelly Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY307UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 12

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Loam	62.7	20.7	16.6	6.7	0.6	1.8	7.5	96.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

A defined [state and transition model](#) is available.

When established in 1985, the site was a mixed stand of Wyoming big sagebrush with a limited herbaceous understory and scattered pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees (Community Phase 2.2). Cheatgrass (*Bromus tectorum*) has been a major component of the herbaceous understory over the sample years. Following the wildfire and seeding in 2007, the site has transitioned to an introduced perennial grass dominated state with cheatgrass remaining a co-dominant species (Community Phase 6.1) (Table - Herbaceous Trends). According to the state and transition model no pathway has been described for this transition, but the site has transitioned from Community Phase 2.2 to Community Phase 6.1. Sagebrush and other shrub species have started to reestablish on the site (Table - Browse Trends). Without further disturbance on the site, it is predicted sagebrush will become the dominant component of the site with an herbaceous understory dominated by introduced perennial grass species (Community Phase 6.2) (USDA-NRCS, 2011).

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 22, study no: 12

Y e a r	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	<b>Total Score</b>	Ranking
1998	21.5	4.3	1.6	14.4	-3.4	1.7	0.0	<b>40.1</b>	Fair
2003	20.0	0.8	0.5	11.0	-3.4	1.0	0.0	<b>29.9</b>	Fair
2008	0.1	0.0	0.0	7.8	-2.3	1.0	0.0	<b>6.6</b>	Very Poor
2013	1.7	0.0	0.0	30.0	-6.0	1.8	0.0	<b>27.6</b>	Fair



HERBACEOUS TRENDS--  
Management unit 22, Study no: 12

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	a-	a-	b84	c138	-	-	1.35	6.47
G	Agropyron dasystachyum	a-	a-	a-	b41	-	-	-	1.43
G	Agropyron intermedium	a-	a-	b109	b113	-	-	1.87	3.75
G	Agropyron spicatum	-	-	-	6	-	-	-	.18
G	Aristida purpurea	b22	b17	a-	a6	.66	.31	-	.03
G	Bromus tectorum (a)	c369	b329	a67	c391	4.59	4.50	3.15	7.98
G	Hilaria jamesii	b71	ab47	a30	ab51	1.18	.31	.26	1.28
G	Oryzopsis hymenoides	a5	a3	ab14	b26	.19	.06	.08	1.00
G	Poa fendleriana	-	-	3	5	-	-	.00	.03
G	Poa secunda	b150	b159	a28	a27	3.09	2.23	.16	.44
G	Sitanion hystrix	b72	b84	a5	a14	1.93	2.40	.06	.05
G	Stipa comata	15	9	7	10	.16	.18	.07	.45
Total for Annual Grasses		369	329	67	391	4.59	4.50	3.15	7.98
Total for Perennial Grasses		335	319	280	437	7.22	5.52	3.88	15.15
Total for Grasses		704	648	347	828	11.81	10.02	7.03	23.13
F	Agoseris glauca	-	4	7	-	-	.01	.06	-
F	Alyssum alyssoides (a)	a-	ab6	ab4	b21	-	.01	.01	.05
F	Arabis demissa	2	-	-	-	.00	-	-	-
F	Astragalus sp.	8	-	1	-	.06	-	.03	-
F	Calochortus nuttallii	1	-	1	-	.00	-	.00	-
F	Castilleja chromosa	3	-	-	-	.03	-	-	-
F	Chenopodium album (a)	-	-	3	-	-	-	.03	-
F	Cryptantha sp.	-	-	-	1	-	-	-	.00
F	Draba sp. (a)	a-	b11	ab4	a-	-	.02	.00	-
F	Erigeron pumilus	11	-	2	-	.59	-	.00	-
F	Erodium cicutarium (a)	a-	a-	a-	b16	-	-	.03	.57
F	Gayophytum ramosissimum(a)	-	-	-	-	-	-	.00	-
F	Gilia sp. (a)	a-	b26	b21	b9	-	.09	1.12	.03
F	Helianthus annuus (a)	-	-	5	-	-	-	.18	-
F	Lappula occidentalis (a)	-	-	2	-	-	-	.00	-
F	Linum perenne	-	-	3	-	-	-	.03	-
F	Lomatium sp.	2	-	-	3	.01	-	-	.00
F	Lupinus argenteus	1	-	-	-	.00	-	-	-
F	Medicago sativa	a-	a-	b24	b17	-	-	.11	.48
F	Mentzelia sp.	-	-	-	-	-	-	.03	-
F	Microsteris gracilis (a)	1	-	-	-	.00	-	-	-
F	Navarretia intertexta (a)	b13	b28	b7	a-	.05	.08	.02	-
F	Onobrychis viciaefolia	-	-	1	-	-	-	.03	-
F	Phlox hoodii	-	-	4	-	-	-	.03	-
F	Phlox longifolia	b24	a9	a11	a13	.11	.01	.05	.03
F	Phlox sp.	a-	b94	a-	a-	-	.47	-	-
F	Ranunculus testiculatus (a)	-	3	-	-	-	.00	-	-

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Sanguisorba minor	a-	a-	b7	ab10	-	-	.13	.38
F	Sisymbrium altissimum (a)	-	-	-	5	-	-	-	.18
F	Sphaeralcea coccinea	-	-	-	-	.00	-	-	-
Total for Annual Forbs		14	74	46	51	0.05	0.21	1.41	0.84
Total for Perennial Forbs		52	107	61	44	0.84	0.49	0.51	0.91
Total for Forbs		66	181	107	95	0.89	0.71	1.92	1.75

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

BROWSE TRENDS--

Management unit 22, Study no: 12

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	16.49	14.27	.00	.94	16.78	-	1.60
B	Chrysothamnus nauseosus	-	-	-	.00	-	-	.45
B	Chrysothamnus viscidiflorus stenophyllus	1.01	1.76	-	-	1.15	-	-
B	Ephedra nevadensis	.74	1.72	-	.44	1.25	-	.75
B	Gutierrezia sarothrae	3.37	3.38	.00	1.09	4.46	-	2.13
B	Juniperus osteosperma	-	-	-	-	.03	-	-
B	Kochia prostrata	-	-	.09	-	-	.06	-
B	Opuntia sp.	-	-	-	-	.13	-	-
B	Pinus edulis	.58	1.56	-	-	.73	-	-
Total for Browse		22.21	22.70	0.10	2.48	24.53	0.06	4.93

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 12

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	19	21	<18	<18	4.7	5.7	-	-
Pinus edulis	54	68	<18	<18	2.7	1.7	-	-

BASIC COVER--

Management unit 22, Study no: 12

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	31.45	34.36	9.57	33.83
Rock	5.43	2.76	6.60	6.56
Pavement	43.72	42.49	57.20	11.92
Litter	36.46	22.28	5.55	40.57
Cryptogams	1.37	.29	0	0
Bare Ground	13.13	8.24	27.41	21.42

PELLET GROUP DATA--

Management unit 22, Study no: 12

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	28	21	3	-
Deer	21	9	-	3
Cattle	1	2	-	2

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
12 (30)	27 (66)	-	5 (13)
6 (15)	4 (11)	-	5 (13)

BROWSE CHARACTERISTICS--

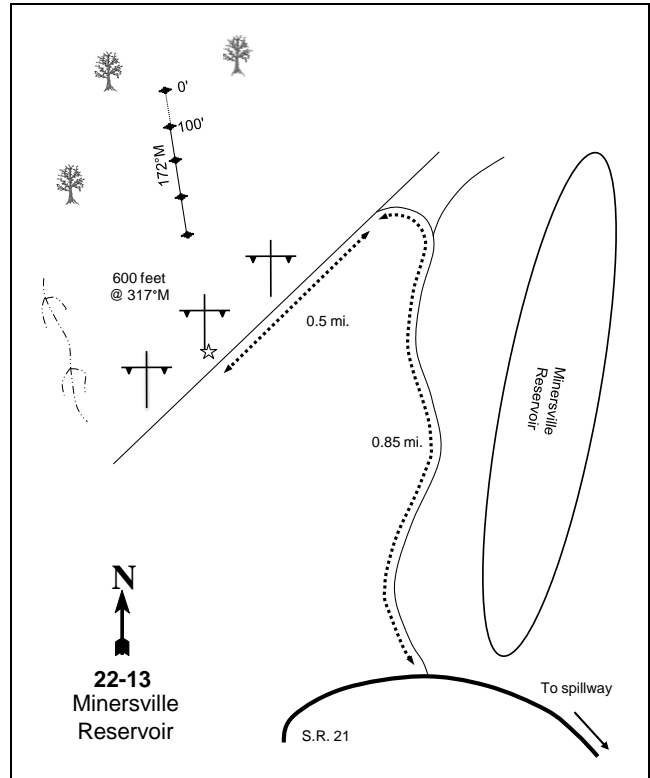
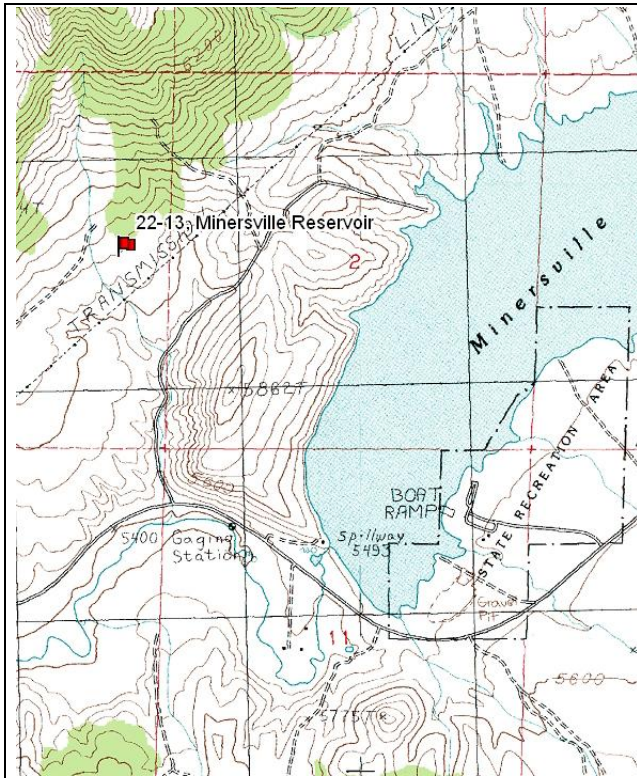
Management unit 22, Study no: 12

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
98	20	0	100	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Artemisia tridentata wyomingensis</b>									
98	3480	1	61	37	100	30	2	11	22/34
03	3420	0	48	52	-	18	.58	25	21/34
08	40	100	0	0	60	0	0	0	-/-
13	260	23	77	0	-	8	0	8	16/23
<b>Chrysothamnus nauseosus</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	23/36
<b>Chrysothamnus parryi</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	15/21
<b>Chrysothamnus viscidiflorus stenophyllus</b>									
98	900	0	89	11	-	0	0	7	11/18
03	900	0	82	18	-	0	0	7	11/17
08	60	100	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	17/22
<b>Ephedra nevadensis</b>									
98	320	50	44	6	40	44	25	25	20/27
03	200	10	80	10	20	50	20	10	22/34
08	0	0	0	0	-	0	0	0	12/18
13	40	0	100	0	-	0	0	0	23/41

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>Gutierrezia sarothrae</i>									
98	10080	20	79	1	160	0	0	.39	8/9
03	5040	0	86	14	20	0	0	21	11/16
08	20	100	0	0	20	100	0	0	-/-
13	300	27	73	0	40	0	0	0	11/20
<i>Juniperus osteosperma</i>									
98	20	100	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Kochia prostrata</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	540	81	19	-	100	0	0	0	8/9
13	0	0	0	-	-	0	0	0	-/-
<i>Leptodactylon pungens</i>									
98	20	100	0	-	-	0	0	0	9/10
03	160	0	100	-	-	25	0	0	7/5
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Mahonia repens</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	6/11
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
98	140	0	100	-	-	0	0	0	6/10
03	140	0	100	-	-	0	0	0	6/18
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
98	60	67	33	-	-	0	0	0	-/-
03	80	100	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	20	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Ribes cereum cereum										
98	<b>120</b>	0	100	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

MINERSVILLE RESERVOIR - TREND STUDY NO. 22-13



**Location Information**

USGS 7.5 min Map Info      Minersville Reservoir; Township 30S, Range 9W, Section 3  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 338410 East 4232776 North

**Transect Information**

Browse Tag # (0' Stake)      7185  
 Transect Bearing              172° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

Travel west on SR 21 from Beaver to Minersville Reservoir. From the Minersville Reservoir sign (south of the reservoir), drive 1.35 miles farther west on SR 21 to an intersection with a dirt road. Turn right and go 0.85 miles. Take a left onto the road that takes you under the powerlines. Go 0.4 miles down across a wash and up a small hill to powerpole #74 (single pole). From the pole, the 0' stake is approximately 600 feet at 317 degrees magnetic. The 0-foot baseline stake is marked by browse tag #7185. The 0', 100', and 200' stakes are rebar; the 300' and 400' stakes are green, half-high fenceposts.

**Site Information**

Land Ownership BLM  
 Allotment Minersville No. 2  
 Elevation 5,670ft (1,728m)  
 Aspect South  
 Slope 6-10%  
 Sample Dates 08/14/1985, 07/30/1991, 06/25/1998, 06/24/2003, 06/09/2008, 06/05/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 13

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Fire	Minersville	-	July 1998	4,052
Chaining (1-Way Smooth)	-	-	Oct. 1998	-
Seeding (Aerial Before)	-	-	Oct. 1998	-
Seeding (Aerial After)	-	-	Feb. 1999	-

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 22, Study no: 13

Project Name: Minersville fire rehab aerial seeding Application: *Aerial Seed 1		Project Name: Minersville fire rehab aerial seeding Application: *Aerial Seed 2	
Seed Type		Seed Type	
G	Indian Ricegrass	G	Crested Wheatgrass
G	Several Wheatgrass Species	B	Forage Kochia
F	Alfalfa	B	Wyoming Big Sagebrush
F	Blue Flax		
F	Palmer Penstemon		
F	Small Burnet		

\*Aerial Seed 1 mix was applied to the project in October 1998, before the chaining. Aerial Seed 2 mix was applied to the project in February 1999, after the chaining.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 22, Study no: 13

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-1998	Wyoming Big Sagebrush	Phase I
2003-2008	Perennial Grass	Phase I
2013	Annual-Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Prior to the burn, thermal and escape cover for deer were provided by dense junipers on the hillside north of the study site, but only a few pockets of live trees remain in the area.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Fine, montmorillonitic, mesic Calcic Argixerolls  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY220UT

SOIL ANALYSIS DATA--

Management unit 24, Study no: 13

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	54.0	21.4	24.6	6.3	0.5	1.0	7.1	121.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions

No state and transition model is available for the above ecological site.

When established in 1985, the site was a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees scattered across the site. Following the fire in 1998, the site transitioned to a seeded introduced perennial and annual grass community, and remains in a stable state. The invasive annual grass species cheatgrass (*Bromus tectorum*) has fluctuated in abundance on the site. Cheatgrass had a high nested frequency when first sampled in 1998, which indicates that cheatgrass was likely a prominent component of the understory prior to 1998 (Table - Herbaceous Trends). Since the fire, sagebrush has been slow to reestablish on the site.

Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 22, 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
1998	11.1	-0.3	2.5	14.2	-11.4	0.0	0.0	<b>16.1</b>	Poor
2003	0.2	0.0	0.0	27.5	-0.4	2.7	0.0	<b>30.0</b>	Fair
2008	0.2	0.0	0.0	30.0	-2.0	0.5	0.0	<b>28.6</b>	Fair
2013	1.6	0.0	0.0	30.0	-9.7	0.5	0.0	<b>22.4</b>	Poor

HERBACEOUS TRENDS--

Management unit 22, Study no: 13

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	a-	b34	c78	d131	-	1.04	3.51	4.81
G	Agropyron intermedium	a-	b35	b62	c112	-	1.10	3.31	4.06
G	Agropyron spicatum	-	-	-	-	-	.01	.03	.03
G	Aristida purpurea	a36	a40	b73	a40	1.61	1.17	2.01	1.34
G	Bouteloua gracilis	b22	ab15	a-	a4	.29	.21	-	.03
G	Bromus inermis	-	1	8	7	-	.04	.33	.31
G	Bromus tectorum (a)	c445	a66	b257	c418	15.16	.44	2.71	12.96
G	Elymus junceus	a-	b7	b15	b21	-	.38	.42	1.18
G	Hilaria jamesii	a79	b123	c184	b129	2.92	8.55	12.53	4.49
G	Oryzopsis hymenoides	12	2	4	10	.32	.07	.19	.34
G	Sitanion hystrix	b68	a11	a14	a10	1.95	.52	.33	.40
G	Sporobolus cryptandrus	a-	b18	ab7	b15	-	.66	.04	.33
G	Stipa comata	-	-	-	1	-	-	-	.00
G	Vulpia octoflora (a)	a-	b8	ab10	ab11	-	.05	.02	.02



Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
	Total for Annual Grasses	445	74	267	429	15.16	0.49	2.73	12.98
	Total for Perennial Grasses	217	286	445	480	7.10	13.77	22.73	17.33
	Total for Grasses	662	360	712	909	22.27	14.26	25.46	30.32
F	Alyssum alyssoides (a)	1	-	-	-	.00	-	-	-
F	Astragalus newberryi	-	-	-	3	-	-	-	.00
F	Calochortus nuttallii	6	18	2	12	.01	.07	.01	.04
F	Collinsia parviflora (a)	-	-	-	3	-	-	-	.00
F	Cryptantha sp.	-	-	-	6	-	-	-	.01
F	Cymopterus sp.	-	-	-	2	-	-	-	.00
F	Eriogonum cernuum (a)	-	2	-	-	-	.06	-	-
F	Erodium cicutarium (a)	-	-	-	2	-	-	-	.03
F	Gilia sp. (a)	a <sup>-</sup>	c <sup>120</sup>	ab <sup>4</sup>	b <sup>17</sup>	-	4.85	.03	.04
F	Leuceleone ericoides	-	18	8	5	-	.60	.03	.15
F	Lupinus brevicaulis (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>1</sup>	b <sup>33</sup>	-	-	.00	.12
F	Machaeranthera canescens	-	-	-	1	-	-	-	.03
F	Medicago sativa	-	7	-	-	-	.05	-	-
F	Phlox longifolia	2	2	-	7	.01	.01	-	.01
F	Ranunculus testiculatus (a)	-	-	-	1	-	-	-	.00
F	Salsola iberica (a)	a <sup>-</sup>	a <sup>4</sup>	b <sup>37</sup>	a <sup>-</sup>	-	.01	.27	-
F	Sisymbrium altissimum (a)	-	2	2	2	-	.03	.00	.04
F	Sphaeralcea coccinea	-	6	6	-	-	.30	.19	-
F	Tragopogon dubius (a)	-	-	-	5	-	-	.00	.33
F	Unknown forb-perennial	-	8	-	-	-	.30	-	-
	Total for Annual Forbs	1	128	44	63	0.00	4.95	0.32	0.58
	Total for Perennial Forbs	8	59	16	36	0.02	1.34	0.23	0.27
	Total for Forbs	9	187	60	99	0.02	6.30	0.55	0.85

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

#### BROWSE TRENDS--

Management unit 22, Study no: 13

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	8.84	-	-	-	-	-	-
B	Chrysothamnus viscidiflorus stenophyllus	-	-	-	-	-	-	.21
B	Ephedra nevadensis	.00	.15	.15	.66	.20	.10	.41
B	Gutierrezia sarothrae	-	-	-	.00	-	-	-
B	Juniperus osteosperma	.06	-	-	-	-	-	-
B	Kochia prostrata	-	-	.00	.54	-	-	.58
B	Opuntia sp.	.03	-	-	-	-	-	-
B	Pinus edulis	.38	-	-	-	-	-	-
	Total for Browse	9.32	0.15	0.15	1.20	.20	.10	1.20

POINT-QUARTER TREE DATA--

Management unit 22, Study no: 13

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	15	<18	<18	<18
Pinus edulis	8	<18	<18	<18

Average diameter (in)			
'98	'03	'08	'13
3.1	-	-	-
3.4	-	-	-

BASIC COVER--

Management unit 22, Study no: 13

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	30.54	20.13	26.56	38.47
Rock	11.05	17.53	15.86	15.76
Pavement	25.52	17.97	26.11	15.13
Litter	34.78	14.30	34.61	31.24
Cryptogams	.01	0	.02	.03
Bare Ground	18.45	36.10	7.34	12.36

PELLET GROUP DATA--

Management unit 22, Study no: 13

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	13	5	35	2
Horse	-	3	-	-
Elk	-	1	-	2
Deer	36	6	4	19
Cattle	1	7	13	8

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	5 (13)	-	-
-	-	-	-
62 (153)	9 (23)	15 (36)	33 (81)
3 (7)	20 (50)	19 (46)	9 (22)

BROWSE CHARACTERISTICS--

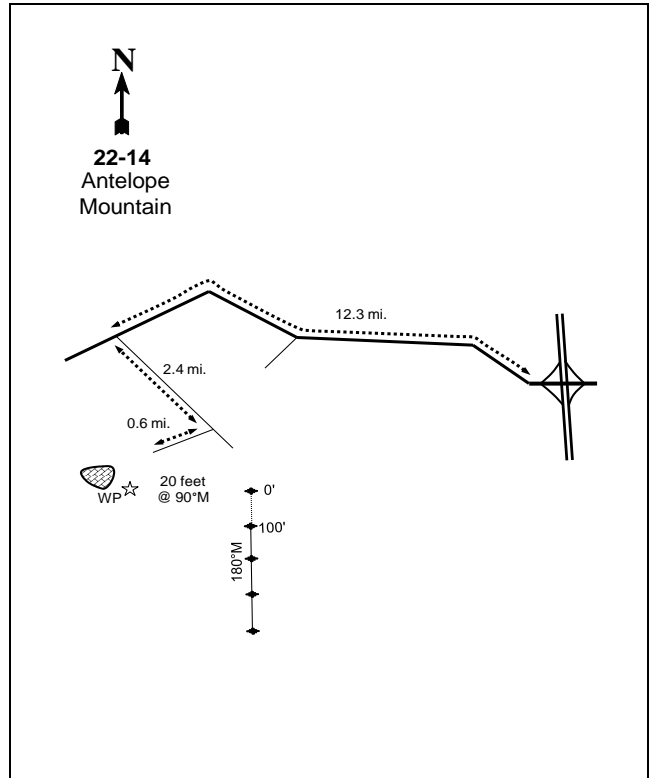
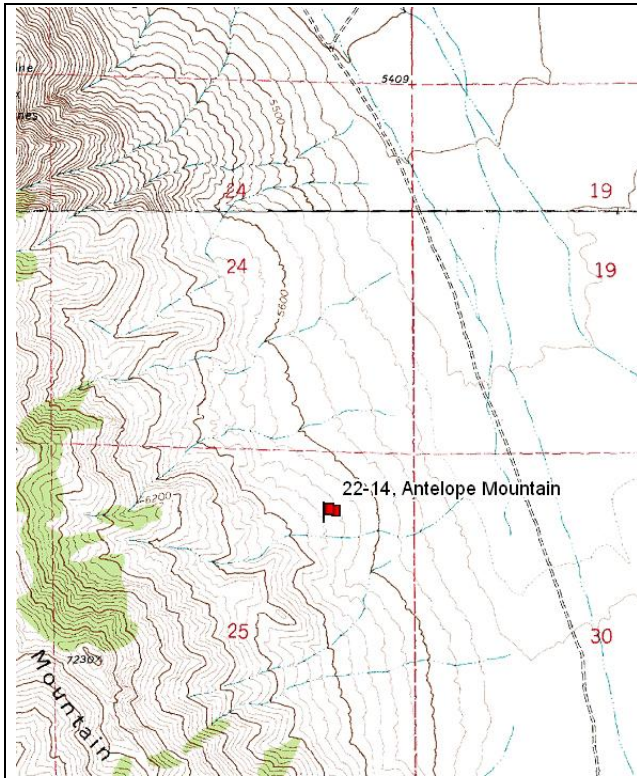
Management unit 22, Study no: 13

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Artemisia tridentata wyomingensis</b>										
98	<b>2780</b>	5	44	51	20	17	0	14	24/31	
03	<b>40</b>	0	100	0	-	0	50	0	9/8	
08	<b>40</b>	0	100	0	-	0	50	0	11/12	
13	<b>40</b>	100	0	0	-	50	50	0	17/19	
<b>Atriplex canescens</b>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	28/36	
08	<b>0</b>	0	0	-	-	0	0	0	46/80	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus nauseosus</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	22/37
13	0	0	0	-	-	0	0	0	25/40
<b>Chrysothamnus viscidiflorus stenophyllus</b>									
98	40	0	100	-	-	0	0	0	13/19
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	21/50
13	60	100	0	-	-	0	0	0	10/13
<b>Echinocereus engelmannii</b>									
98	0	0	0	-	-	0	0	0	5/7
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Ephedra nevadensis</b>									
98	0	0	0	0	-	0	0	0	-/-
03	20	0	100	0	-	0	0	0	13/16
08	20	0	0	100	-	0	0	0	17/33
13	40	50	50	0	-	0	0	0	27/49
<b>Gutierrezia sarothrae</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	13/23
08	0	0	0	-	-	0	0	0	6/6
13	60	0	100	-	20	0	0	0	4/9
<b>Juniperus osteosperma</b>									
98	20	100	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Kochia prostrata</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	20	0	0	0	10/21
13	420	48	52	-	6200	0	0	0	11/21
<b>Leptodactylon pungens</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	400	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Opuntia sp.										
98	<b>40</b>	0	100	-	-	0	0	0	6/11	
03	<b>0</b>	0	0	-	-	0	0	0	8/19	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
Sarcobatus vermiculatus										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	21/102	

ANTELOPE MOUNTAIN - TREND STUDY NO. 22-14



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Pinnacle Pass; Township 25S, Range 9W, Section 25  
NAD 83, UTM Zone 12, 337372 East 4275355 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
180° magnetic  
400ft  
Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Standard

**Directions to Site**

From the Cove Fort exit on I-15 (a few miles north of the Junction with I-70), proceed 12.3 miles west on a gravel road staying right at one major fork. Turn left at the intersection and continue for 2.4 miles to the southwest corner of a fence. Turn right and go 0.6 miles up this faint road. This road no longer exists. Take a bearing of 233 degrees magnetic from the old burnt fence corner to the site. Then walk or drive (faint two-track) to a witness post near a large rock. The 0-foot frequency baseline stake is 20 feet east of this rock. The baseline is marked by steel rebar posts.

**Site Information**

Land Ownership BLM  
 Allotment Twin Peaks  
 Elevation 5,700ft (1,737m)  
 Aspect East  
 Slope 20-25%  
 Sample Dates 08/04/1985, 07/27/1991, 06/17/1998, 06/24/2003, 08/08/2008, 06/05/2013

**DISTURBANCE HISTORY--**

Management unit 22, Study no: 14

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	-	-	1996	-
Chaining	-	-	1996	-
Seeding	-	-	1996	-
Fire	Milford Flat	-	2007	356,665

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Pronghorn, Crucial Year-Long

**VEGETATION HISTORY--**

Management unit 22, Study no: 14

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-1991	Mountain Big Sagebrush	Phase I
1998-2013	Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Two deer shed antlers were found on the site during the 1991 sampling, and it was noted that use appeared to be more concentrated higher up the hill. The site has burned twice since the study was established. The ridge above the site near the top has a few remaining patches of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees that may provide escape and thermal cover for deer.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, carbonatic, mesic Xeric Torrifluvents  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY310UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 14

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	36.0	37.4	26.6	7.1	0.6	2.2	6.0	201.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transition**

No state and transition model is available for the above ecological site.

When established in 1985, the site was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a limited herbaceous understory of native forb and grass species (Appendix B -Pre-1992 Data). Pinyon pine and Utah juniper were scattered in low abundance across the site. Follow the fire in 1996, the site

has remained stable in a seeded introduced perennial grass state. Cheatgrass (*Bromus tectorum*) has increased in abundance on the site following the fire and has become a major component of the site (Table - Disturbance History, Table- Herbaceous Trend). Sagebrush has been slow to reestablish on the site.

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 22, study no: 14

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	0.0	0.0	0.0	30.0	-0.3	10.0	0.0	<b>39.7</b>	Poor
2003	0.6	0.0	0.0	23.9	-9.0	1.4	0.0	<b>16.9</b>	Very Poor
2008	0.1	0.0	0.0	30.0	-0.7	1.4	0.0	<b>30.8</b>	Very Poor
2013	0.0	0.0	0.0	30.0	-6.0	10.0	0.0	<b>34.0</b>	Very Poor-Poor

### HERBACEOUS TRENDS--

Management unit 22, Study no: 14

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	b174	a123	a104	a84	6.79	3.00	4.11	3.27
G	Agropyron intermedium	b102	a53	a66	b110	3.18	.83	3.20	4.52
G	Agropyron spicatum	61	56	57	56	3.55	3.21	2.40	2.58
G	Aristida purpurea	a2	a-	b43	b55	.01	-	1.01	1.85
G	Bromus tectorum (a)	a49	c406	b212	c396	.37	11.92	.89	7.96
G	Hilaria jamesii	ab62	a64	b98	b104	2.12	1.71	5.70	4.51
G	Oryzopsis hymenoides	-	-	-	2	-	-	-	.00
G	Poa secunda	a10	c201	b142	ab168	.03	3.19	1.30	3.45
G	Vulpia octoflora (a)	a-	b17	a-	a-	-	.02	-	-
Total for Annual Grasses		49	423	212	396	0.37	11.94	0.89	7.96
Total for Perennial Grasses		411	497	510	579	15.69	11.95	17.73	20.20
Total for Grasses		460	920	722	975	16.07	23.90	18.62	28.17
F	Alyssum alyssoides (a)	b39	a1	a11	a10	.08	.00	.02	.02
F	Astragalus utahensis	b29	a-	b21	b36	1.00	.01	.24	1.45
F	Calochortus nuttallii	-	-	2	3	-	-	.00	.00
F	Cirsium sp.	-	-	-	1	-	-	-	.00
F	Comandra pallida	-	-	-	1	-	-	-	.00
F	Draba sp. (a)	1	-	3	-	.00	-	.00	-
F	Erodium cicutarium (a)	a26	b174	c223	c250	.95	4.27	6.38	4.84
F	Gilia sp. (a)	-	-	-	4	-	-	-	.00
F	Lactuca serriola (a)	-	-	-	2	-	-	-	.01
F	Leucelene ericoides	1	-	-	-	.00	-	-	-
F	Medicago sativa	b49	a18	a13	a20	4.87	.60	.46	4.62
F	Phlox longifolia	a3	a-	a-	b14	.03	-	-	.21
F	Ranunculus testiculatus (a)	-	-	-	12	-	-	-	.07
F	Sanguisorba minor	5	-	-	-	.10	-	-	-
F	Sphaeralcea coccinea	5	5	4	8	.18	.12	.01	.21

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
	Total for Annual Forbs	66	175	237	278	1.03	4.27	6.41	4.95
	Total for Perennial Forbs	92	23	40	83	6.20	0.72	0.72	6.51
	Total for Forbs	158	198	277	361	7.23	5.00	7.13	11.47

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

#### BROWSE TRENDS--

Management unit 22, Study no: 14

Type	Species	Quadrat Cover %				Line intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Chrysothamnus nauseosus albicaulis	-	.44	.03	-	.33	-	-
B	Ephedra nevadensis	-	-	.03	.15	-	.06	-
B	Gutierrezia sarothrae	1.62	.21	.00	1.46	.85	-	2.45
	Total for Browse	1.62	0.65	0.06	1.61	1.18	0.06	2.45

#### BASIC COVER--

Management unit 22, Study no: 14

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	25.05	33.26	24.98	44.80
Rock	21.08	24.05	23.32	23.92
Pavement	39.57	15.56	30.92	12.65
Litter	39.48	33.09	20.25	33.70
Cryptogams	.66	.07	.00	0
Bare Ground	19.08	2.73	7.81	1.83

#### PELLET GROUP DATA--

Management unit 22, Study no: 14

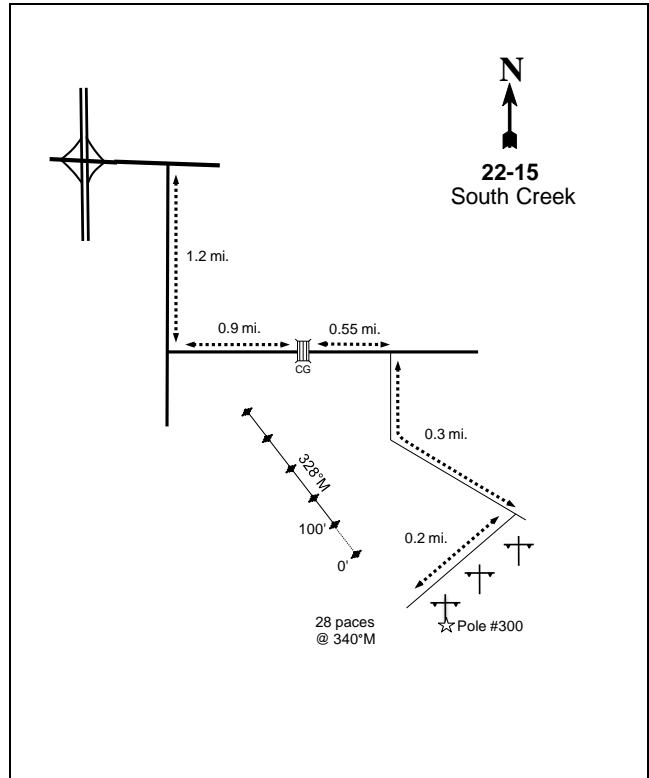
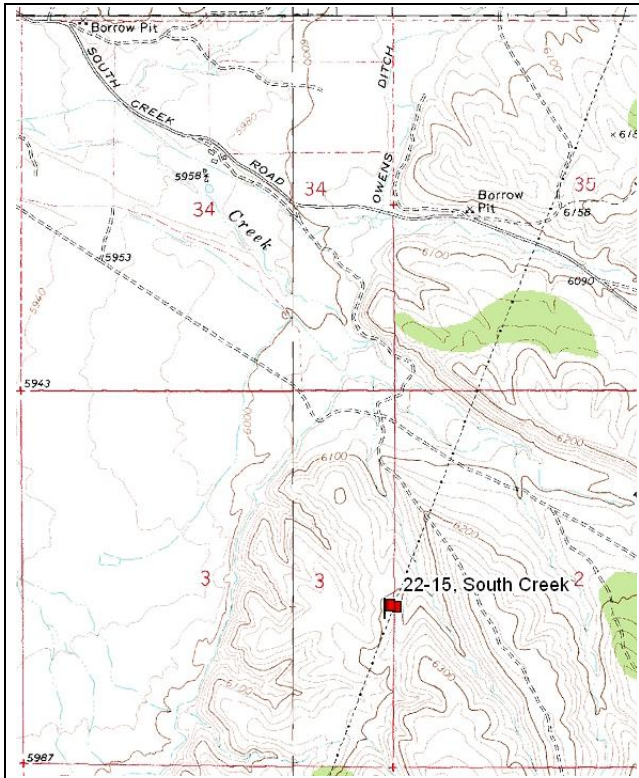
Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	4	17	21	-	-	-	-	-
Elk	-	12	2	-	-	39 (96)	2 (5)	2 (5)
Deer	16	6	18	-	13 (32)	5 (12)	50 (124)	-
Cattle	1	3	-	2	6 (15)	25 (61)	-	12 (30)



BROWSE CHARACTERISTICS--  
Management unit 22, Study no: 14

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus nauseosus albicaulis</i>										
98	20	0	100	-	-	0	0	0	17/26	
03	40	0	100	-	-	0	0	0	24/40	
08	20	100	0	-	-	0	100	100	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Ephedra nevadensis</i>										
98	20	0	100	0	-	100	0	0	18/14	
03	60	0	100	0	-	0	100	0	19/26	
08	280	64	21	14	-	7	7	14	5/9	
13	20	100	0	0	-	0	0	0	14/26	
<i>Gutierrezia sarothrae</i>										
98	1000	8	90	2	-	0	0	0	10/17	
03	980	2	94	4	-	0	0	0	7/9	
08	0	0	0	0	20	0	0	0	-/-	
13	1100	5	93	2	-	0	0	0	9/14	
<i>Juniperus osteosperma</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	20	0	100	-	-	0	0	0	3/8	
03	0	0	0	-	-	0	0	0	8/19	
08	0	0	0	-	-	0	0	0	6/15	
13	20	0	100	-	-	0	0	0	8/24	
<i>Pediocactus simpsonii</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	20	0	100	-	-	0	0	0	2/2	
13	20	0	100	-	-	0	0	0	2/4	
<i>Tetradymia canescens</i>										
98	20	0	100	-	-	0	0	0	9/12	
03	0	0	0	-	-	0	0	0	28/33	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	

SOUTH CREEK - TREND STUDY NO. 22-15



**Location Information**

USGS 7.5 min Map Info Kane Canyon; Township 30S, Range 7W, Section 3  
 GPS (0' Stake) NAD 83, UTM Zone 12, 358097 East 4232159 North

**Transect Information**

Browse Tag # (0' Stake) 474  
 Transect Bearing 328° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Belt 2: 2ft, Belt 5: 2ft

**Directions to Site**

From I-15 take exit 109 and go past the Texaco station and turn right (south) onto campground road. Go 1.2 miles to where the pavement ends and a road takes off at an angle to the southeast. Take this road and go 0.9 miles to a cattleguard. Go straight for another 0.55 miles. Turn right onto a faint road down a draw for 0.3 miles. At this point there is another faint road on the right along the powerlines. Go down the road for 0.2 miles to power pole #300 (the second set of power poles). From power pole #300, the 0' stake is 28 paces at 340 degrees magnetic. The 0-foot stake is marked with browse tag #474.

**Site Information**

Land Ownership UDWR  
 Allotment Lee Springs  
 Elevation 6,170ft (1,881m)  
 Aspect West  
 Slope 8%  
 Sample Dates 08/10/1998, 06/17/2003, 06/02/2008, 05/29/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Sage-Grouse Opportunity Not Winter

VEGETATION HISTORY--

Management unit 22, Study no: 15

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The general area consists of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and grass species with scattered Utah junipers (*Juniperus osteosperma*) surrounding the site. Limited escape and thermal cover is located in juniper covered draws to the east and west. Deer presence was high in 1998, 2008, and 2013 (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Aridic Calcic Argixerolls  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY220UT

SOIL ANALYSIS DATA--

Management unit 22, Study no: 15

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	53.4	22.0	24.6	7.0	0.6	1.8	7.1	134.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since the established of the study site in 1985, the site has remained in a stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) being the dominant component of the site (Table - Browse Trends). The herbaceous understory has consisted of native and introduced species over the sample periods (Appendix - Pre - 1992 Data). The invasive annual grass species cheatgrass (*Bromus tectorum*) has fluctuated in abundance on the site and has been a major component of the herbaceous understory (Table - Herbaceous Understory). The resilience of the community is at risk due to the high abundance of cheatgrass sampled on the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 22, study no: 15

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	11.3	5.1	7.0	21.0	-9.6	0.7	0.0	<b>35.5</b>	Fair
2003	17.0	2.1	3.0	15.1	0.0	0.9	0.0	<b>38.1</b>	Fair
2008	15.4	9.3	15.0	10.3	-2.7	2.2	0.0	<b>49.5</b>	Good
2013	17.0	11.7	14.5	16.0	-11.5	1.3	0.0	<b>49.0</b>	Good

## HERBACEOUS TRENDS--

Management unit 22, Study no: 15

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Aristida purpurea	b88	a20	a23	a4	2.01	.37	.47	.01
G	Bouteloua gracilis	ab61	bc108	a61	c104	1.86	3.06	1.07	3.77
G	Bromus tectorum (a)	c466	a-	b335	b471	12.83	-	3.64	15.22
G	Hilaria jamesii	b116	b99	b123	a50	2.56	1.20	2.78	1.25
G	Oryzopsis hymenoides	ab26	a10	b43	ab25	.25	.51	.38	.80
G	Sitanion hystrix	a13	a30	b49	b61	.20	.22	.38	1.28
G	Sporobolus cryptandrus	d102	c60	a-	b15	2.83	1.63	-	.33
G	Stipa comata	c55	ab32	a8	bc39	.79	.54	.04	.55
G	Vulpia octoflora (a)	a8	a-	a6	b42	.01	-	.01	.09
Total for Annual Grasses		474	0	341	513	12.85	0	3.65	15.32
Total for Perennial Grasses		461	359	307	298	10.52	7.55	5.15	8.00
Total for Grasses		935	359	648	811	23.37	7.55	8.80	23.33
F	Alyssum alyssoides (a)	a-	a-	b23	c73	-	-	.09	.17
F	Astragalus lentiginosus	a6	a-	b22	ab12	.01	-	.05	.02
F	Calochortus nuttallii	-	3	2	-	-	.00	.00	-
F	Cymopterus sp.	-	-	6	6	-	-	.01	.01
F	Descurainia pinnata (a)	-	5	-	-	-	.03	-	-
F	Draba sp. (a)	-	-	-	2	-	-	-	.00
F	Erigeron pumilus	-	-	-	-	-	-	-	.00
F	Gilia sp. (a)	a-	c147	b29	b20	-	5.54	.10	.05
F	Helianthella uniflora	-	-	4	-	-	-	.00	-
F	Lactuca serriola (a)	-	4	-	-	-	.15	-	-
F	Lappula occidentalis (a)	a1	b44	c171	b75	.00	1.00	.72	.15
F	Lupinus brevicaulis (a)	a-	a-	b12	a-	-	-	.06	-
F	Microsteris gracilis (a)	1	-	-	3	.00	-	-	.00
F	Phlox longifolia	-	-	7	7	-	-	.01	.01
F	Ranunculus testiculatus (a)	a-	a-	b241	b229	-	-	.93	.58
F	Sphaeralcea coccinea	39	33	37	51	.36	.44	1.01	.60
F	Tragopogon dubius (a)	-	-	-	1	-	-	-	.00
Total for Annual Forbs		2	200	476	403	0.01	6.73	1.91	0.98

Type	Species	Nestled Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
	Total for Perennial Forbs	45	36	78	76	0.37	0.44	1.10	0.66
	Total for Forbs	47	236	554	479	0.38	7.17	3.01	1.64

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

**BROWSE TRENDS--**

Management unit 22, Study no: 15

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	9.00	13.61	12.31	13.57	10.81	14.51	16.96
B	Chrysothamnus viscidiflorus viscidiflorus	.03	-	.00	-	-	-	-
B	Opuntia polyacantha	-	-	-	.18	-	-	.03
B	Pediocactus simpsonii	-	.00	.03	.03	-	-	-
B	Pinus edulis	-	-	.00	-	-	-	-
	Total for Browse	9.03	13.61	12.35	13.78	10.81	14.51	16.99

**BASIC COVER--**

Management unit 22, Study no: 15

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	42.80	28.52	23.80	37.77
Rock	4.00	5.46	6.23	8.74
Pavement	22.86	28.61	23.09	15.73
Litter	50.62	29.59	36.67	44.98
Cryptogams	.03	.02	.04	.36
Bare Ground	8.14	20.26	21.32	11.03

**PELLET GROUP DATA--**

Management unit 22, Study no: 15

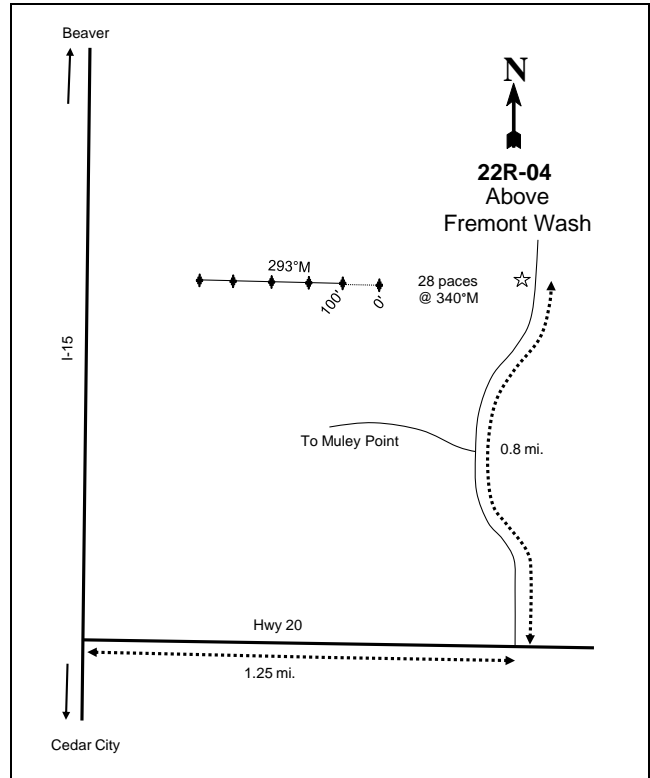
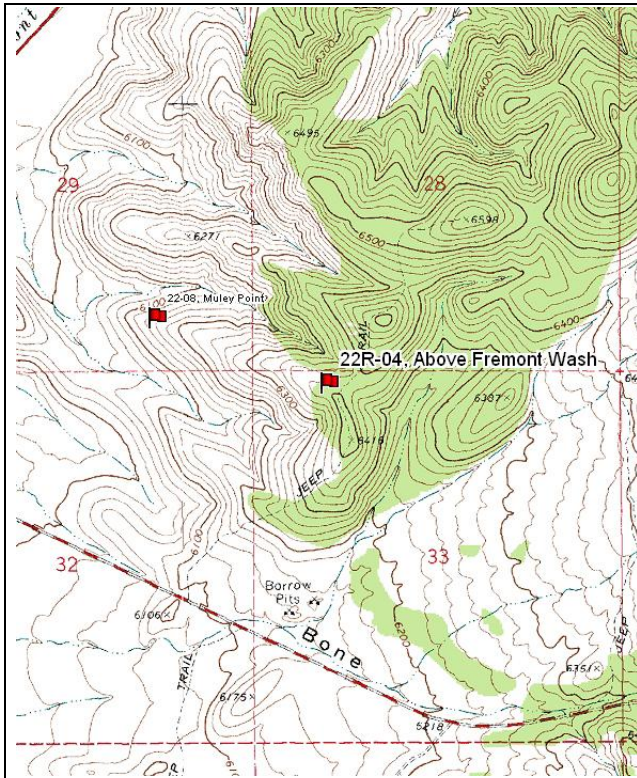
Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	8	3	72	14	-	-	-	-
Elk	1	-	-	3	1 (2)	-	-	-
Deer	47	8	59	33	68 (168)	29 (71)	99 (245)	60 (147)
Cattle	10	6	12	2	41 (101)	19 (47)	9 (22)	17 (43)

BROWSE CHARACTERISTICS--

Management unit 22, Study no: 15

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>Amelanchier utahensis</i>									
98	20	100	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Artemisia tridentata wyomingensis</i>									
98	3620	14	54	33	120	45	25	10	21/30
03	3040	6	51	43	-	27	67	9	19/27
08	7020	50	30	19	4160	37	21	9	19/30
13	5320	29	60	11	240	34	36	9	19/30
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	20	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
98	0	0	0	-	-	0	0	0	6/7
03	0	0	0	-	-	0	0	0	6/8
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Opuntia polyacantha</i>									
98	40	0	100	-	-	0	0	0	4/4
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	6/6
13	60	0	100	-	-	0	0	0	5/8
<i>Opuntia whipplei</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	22/35
<i>Pediocactus simpsonii</i>									
98	0	0	0	-	-	0	0	0	-/-
03	40	0	100	-	-	0	0	0	0/2
08	60	0	100	-	-	0	0	0	1/2
13	40	0	100	-	-	0	0	0	3/7
<i>Pinus edulis</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	20	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

ABOVE FREMONT WASH - TREND STUDY NO. 22R-4



**Location Information**

USGS 7.5 min Map Info      Buckhorn Flat; Township 31S, Range 7W, Section 33  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 354328 East 4215100 North

**Transect Information**

Browse Tag # (0' Stake)      406  
 Transect Bearing              293° magnetic  
 Length                          500ft  
 Belt Placement                Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement      Standard

**Directions to Site**

South of Beaver on I-15 take exit # 95. Drive 1.25 miles east on SR 20 to a road going north (left side of the road). Drive 0.8 miles to the witness post (the road to the Muley Point site will be passed on the way). From the witness post, walk 300 feet at 267 degrees magnetic to the 0' stake. The 0' stake is marked by browse tag #406.

**Site Information**

Land Ownership BLM  
 Allotment Bone Hollow  
 Elevation 6,390ft (1,948m)  
 Aspect Southwest  
 Slope 20-25%  
 Sample Dates 08/19/1999, 06/18/2003, 06/11/2008, 06/04/2013

**DISTURBANCE HISTORY--**

Management unit 22R, Study no: 4

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Lop and Scatter	-	-	2008-2013	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Sage-Grouse Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 22R, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1999-2013	Wyoming Big Sagebrush/Annual Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Part of the transect was treated with a lop and scatter method between 2008 and 2013. With the exception of 2008, use of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) has been moderate to high over the sample years (Table - Browse Characteristics). Deer presence was high in 1999, 2003, and 2008 (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Loamy, mixed, mesic, shallow Petrocalcic Palexerolls  
 NRCS Ecological Site Semidesert Stony Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY257UT

**SOIL ANALYSIS DATA--**

Management unit 22R, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	42.0	34.7	23.3	6.8	0.5	1.7	7.1	147.2	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Since established in 1999, the site has remained in a stable state with Wyoming big sagebrush and Cholla cactus (*Opuntia whipplei*) being the dominant shrubs (Table - Browse Trends). The herbaceous understory has been in poor condition with cheatgrass (*Bromus tectorum*) being the dominant component. Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been a minor component of the site with the potential to be dominant over time and without disturbance (Table - Point-Quarter Tree Data). Sagebrush has steadily decreased on the site. With the decrease of sagebrush and the high abundance of cheatgrass sampled on the



site, the site is at risk of transitioning from a sagebrush dominated state to an annual grass state. The resilience of the community is at risk.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 22R, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	4.7	0.0	0.0	16.8	-9.8	0.2	0.0	<b>11.9</b>	Very Poor-Poor
2003	10.3	6.0	0.5	9.8	-17.4	0.4	0.0	<b>9.6</b>	Very Poor-Poor
2008	5.5	0.0	0.0	8.8	-8.7	0.9	0.0	<b>6.5</b>	Very Poor
2013	4.7	0.0	0.0	13.9	-15.7	0.6	0.0	<b>3.5</b>	Very Poor

#### HERBACEOUS TRENDS--

Management unit 22R, Study no: 4

Type	Species	Nested Frequency				Average Cover %			
		'99	'03	'08	'13	'99	'03	'08	'13
G	Agropyron spicatum	-	-	-	1	-	.00	.00	.15
G	Aristida purpurea	-	4	1	1	-	.06	.03	.03
G	Bouteloua gracilis	46	70	48	71	1.49	2.13	1.17	2.50
G	Bromus tectorum (a)	<sub>b</sub> 453	<sub>a</sub> 410	<sub>a</sub> 417	<sub>b</sub> 479	13.06	23.11	11.58	20.92
G	Hilaria jamesii	<sub>a</sub> -	<sub>a</sub> 5	<sub>c</sub> 73	<sub>b</sub> 34	-	.06	1.67	1.47
G	Oryzopsis hymenoides	<sub>b</sub> 50	<sub>b</sub> 47	<sub>a</sub> 19	<sub>b</sub> 49	2.12	1.17	.81	1.82
G	Poa fendleriana	-	-	-	2	-	-	-	.01
G	Poa secunda	<sub>a</sub> -	<sub>a</sub> -	<sub>ab</sub> 8	<sub>b</sub> 20	-	-	.03	.16
G	Sitanion hystrix	<sub>a</sub> 1	<sub>b</sub> 34	<sub>b</sub> 34	<sub>b</sub> 26	.00	.42	.46	.50
G	Sporobolus cryptandrus	<sub>d</sub> 99	<sub>c</sub> 38	<sub>a</sub> -	<sub>b</sub> 10	4.73	1.00	-	.10
G	Stipa comata	6	3	11	4	.06	.04	.22	.18
G	Vulpia octoflora (a)	<sub>a</sub> -	<sub>b</sub> 22	<sub>a</sub> 4	<sub>b</sub> 17	-	.06	.01	.06
Total for Annual Grasses		453	432	421	496	13.06	23.18	11.60	20.99
Total for Perennial Grasses		202	201	194	218	8.41	4.92	4.42	6.94
Total for Grasses		655	633	615	714	21.47	28.10	16.02	27.93
F	Calochortus nuttallii	-	-	-	3	-	-	-	.00
F	Collinsia parviflora (a)	<sub>a</sub> -	<sub>b</sub> 11	<sub>b</sub> 12	<sub>ab</sub> 3	-	.02	.02	.01
F	Descurainia pinnata (a)	<sub>a</sub> -	<sub>b</sub> 8	<sub>ab</sub> 13	<sub>b</sub> 20	-	.02	.05	.06
F	Draba sp. (a)	-	3	-	-	-	.00	-	-
F	Erigeron eatonii	3	1	-	-	.00	.00	-	-
F	Erigeron pumilus	-	-	-	5	-	-	-	.06
F	Eriogonum cernuum (a)	2	1	3	3	.00	.00	.00	.00
F	Erodium cicutarium (a)	-	-	4	10	-	-	.03	.21
F	Gilia sp. (a)	<sub>a</sub> -	<sub>c</sub> 49	<sub>b</sub> 25	<sub>a</sub> -	-	.23	.04	-
F	Holosteum umbellatum (a)	-	-	-	3	-	-	-	.00
F	Lactuca serriola (a)	-	-	-	5	-	-	-	.01
F	Lappula occidentalis (a)	-	1	2	9	-	.00	.00	.01
F	Leucelene ericoides	-	4	5	1	-	.03	.03	.00

Type	Species	Nested Frequency				Average Cover %			
		'99	'03	'08	'13	'99	'03	'08	'13
F	Microsteris gracilis (a)	a <sup>-</sup>	b <sup>12</sup>	a <sup>-</sup>	a <sup>4</sup>	-	.03	-	.01
F	Phlox austromontana	-	5	2	-	-	.00	.00	-
F	Phlox longifolia	-	-	-	4	-	-	-	.00
F	Ranunculus testiculatus (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>25</sup>	ab <sup>8</sup>	-	-	.05	.02
F	Sisymbrium altissimum (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>10</sup>	ab <sup>5</sup>	-	-	.07	.03
F	Sphaeralcea coccinea	17	10	20	11	.10	.14	.40	.22
Total for Annual Forbs		2	85	94	70	0.00	0.33	0.29	0.37
Total for Perennial Forbs		20	20	27	24	0.10	0.19	0.43	0.29
Total for Forbs		22	105	121	94	0.11	0.52	0.72	0.67

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

#### BROWSE TRENDS--

Management unit 22R, Study no: 4

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	3.74	8.21	4.41	3.79	8.20	4.71	3.86
B	Echinocereus sp.	-	-	-	.15	.15	.18	.16
B	Juniperus osteosperma	.15	.15	-	-	.80	.83	-
B	Opuntia polyacantha	-	-	.03	.03	-	-	-
B	Opuntia whipplei	1.41	1.85	1.69	2.30	1.50	1.71	1.95
B	Pinus edulis	.03	-	-	-	-	.25	-
Total for Browse		5.33	10.21	6.13	6.27	10.65	7.68	5.97

#### POINT-QUARTER TREE DATA--

Management unit 22R, Study no: 4

Species	Trees per Acre				Average diameter (in)			
	'99	'03	'08	'13	'99	'03	'08	'13
Juniperus osteosperma	31	17	31	24	10.0	10.4	11.2	5.6
Pinus edulis	31	31	<18	22	3.0	4.0	-	1.2

#### BASIC COVER--

Management unit 22R, Study no: 4

Cover Type	Average Cover %			
	'99	'03	'08	'13
Vegetation	32.46	40.91	25.31	40.54
Rock	18.98	15.79	15.80	12.45
Pavement	13.87	19.65	13.94	5.81
Litter	30.85	24.50	46.99	60.37
Cryptogams	.48	.01	.11	.03
Bare Ground	9.31	10.58	9.14	3.45

PELLET GROUP DATA--

Management unit 22R, Study no: 4

Type	Quadrat Frequency			
	'99	'03	'08	'13
Rabbit	27	17	90	9
Elk	-	-	1	-
Deer	21	27	43	32
Cattle	-	1	1	-

Days use per acre (ha)			
'99	'03	'08	'13
-	-	-	-
-	-	-	-
73 (180)	62 (152)	117 (289)	31 (76)
-	1 (3)	4 (9)	9 (23)

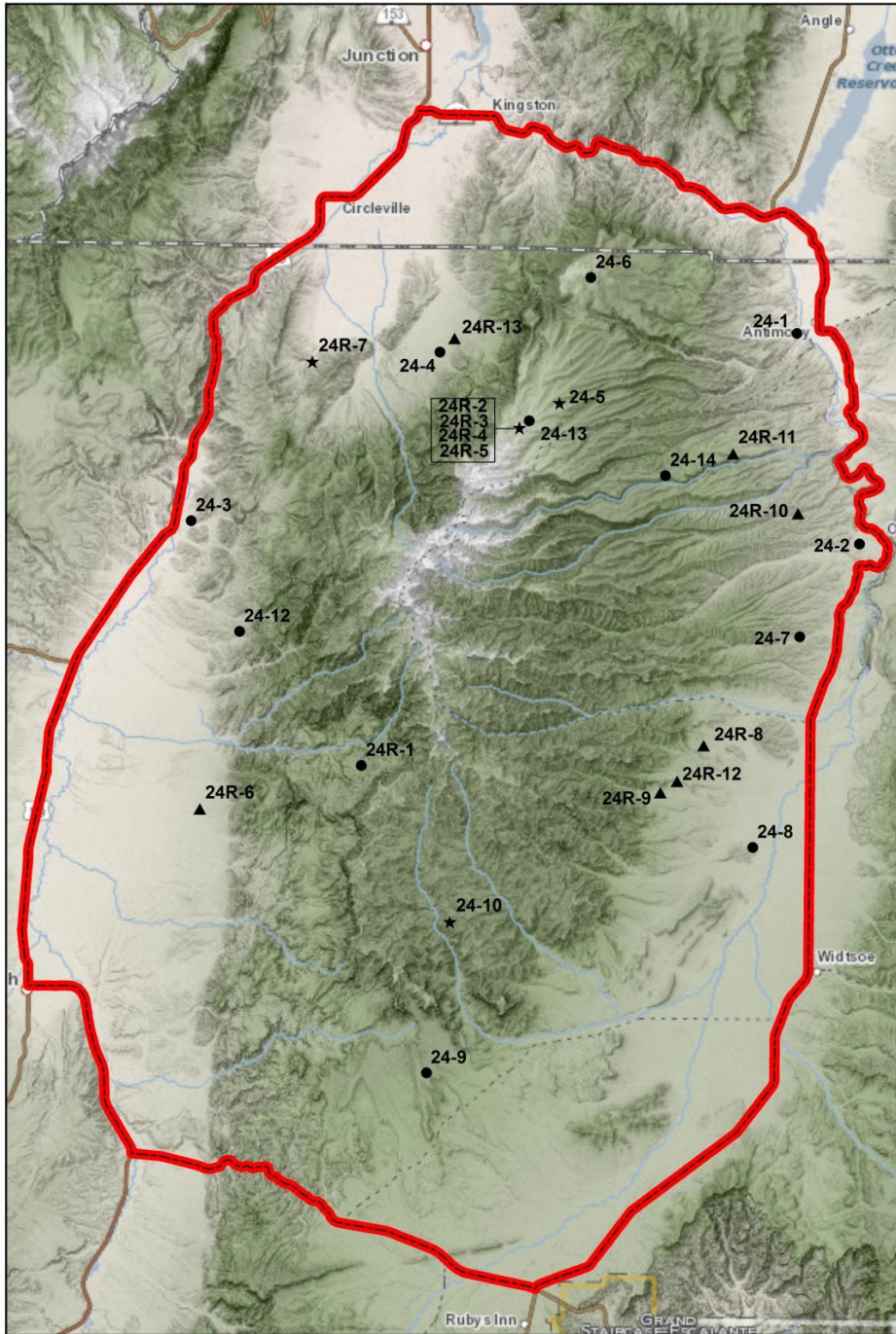
BROWSE CHARACTERISTICS--

Management unit 22R, Study no: 4

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>									
99	<b>2680</b>	3	74	23	20	31	53	19	17/26
03	<b>2800</b>	1	69	30	-	41	58	6	18/26
08	<b>2060</b>	0	24	76	1920	21	13	43	19/26
13	<b>1540</b>	6	51	43	-	32	56	39	19/25
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	10/13
<i>Echinocereus sp.</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	0	0	5/14
08	<b>20</b>	0	100	-	-	0	0	0	4/13
13	<b>40</b>	0	100	-	-	0	0	0	7/19
<i>Gutierrezia sarothrae</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>40</b>	0	100	-	-	0	0	0	6/5
08	<b>20</b>	0	100	-	-	0	0	0	8/6
13	<b>40</b>	0	100	-	-	0	0	0	6/8
<i>Opuntia polyacantha</i>									
99	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>0</b>	0	0	0	-	0	0	0	6/22
08	<b>40</b>	0	100	0	-	0	0	0	7/12
13	<b>60</b>	0	67	33	-	0	0	33	5/15
<i>Opuntia whipplei</i>									
99	<b>240</b>	0	100	0	-	0	0	0	15/33
03	<b>280</b>	7	93	0	-	0	0	0	16/36
08	<b>320</b>	13	69	19	-	0	0	13	14/34
13	<b>340</b>	6	88	6	-	0	0	6	14/33

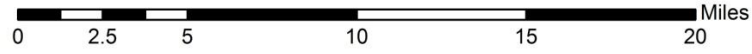
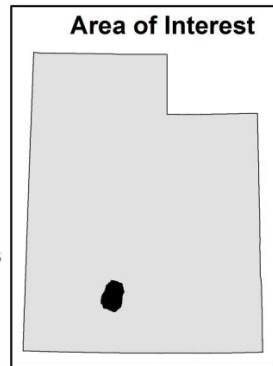
		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Pediocactus simpsonii</i>										
99	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	2/2	
13	0	0	0	-	-	0	0	0	-/-	
<i>Pinus edulis</i>										
99	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	37/25	

# WILDLIFE MANAGEMENT UNIT 24 - MT DUTTON

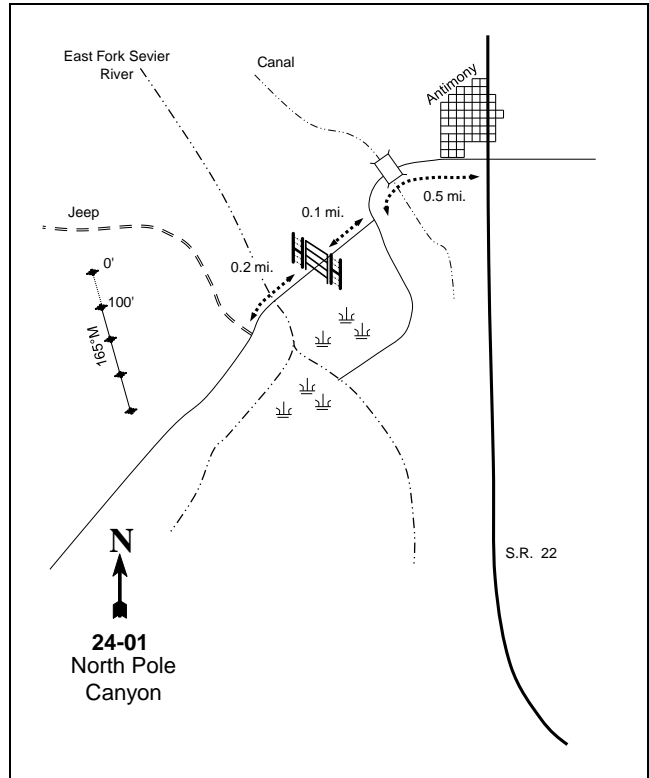
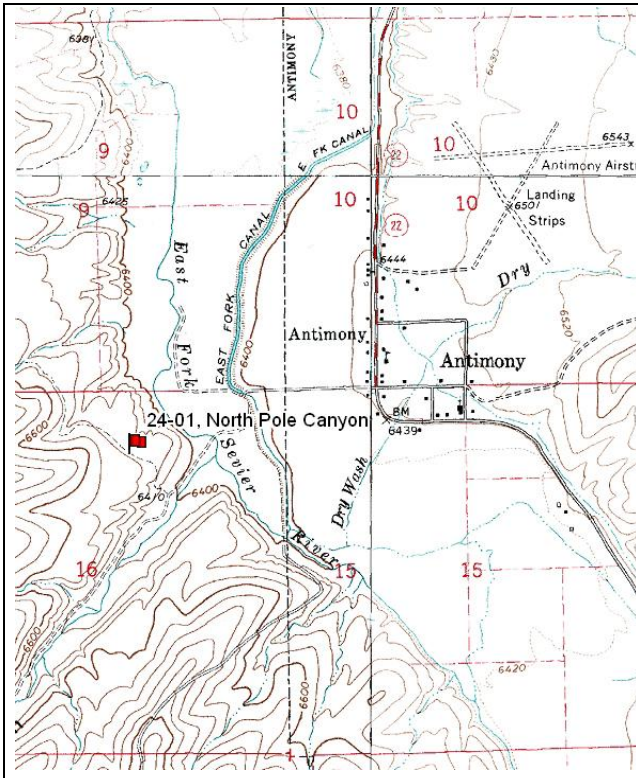


**Unit 24 Boundary**  
**Study Location**  
**Project, Status**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active
- ★ WRI, Suspended



NORTH POLE CANYON - TREND STUDY NO. 24-1



**Location Information**

USGS 7.5 min Map Info      Deep Creek; Township 31S, Range 2W, Section 16  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 411215 East 4218943 North

**Transect Information**

Browse Tag # (0' Stake)      Not available  
 Transect Bearing              165° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Belt 2: 3ft

**Directions to Site**

Drive west on the Mt. Dutton road from the town of Antimony for approximately 0.5 mile to a canal and bridge. Just past the canal bridge, turn right, go through a gate and bear left towards the Sevier River. Go 0.1 mile to another gate. Go through the gate and continue 0.2 miles across a field to the river. The old road may be inaccessible, if so, cross the river on foot and hike up the hill to the southwest along an old jeep trail. The transect is on top of the hill and starts 20 feet south of the old road. The study is marked by short, green fence posts. There is a browse tag on the 0' stake.

### Site Information

Land Ownership Private  
 Allotment Pole Canyon  
 Elevation 6,530ft (1,990m)  
 Aspect Northeast  
 Slope 2-4%  
 Sample Dates 08/07/1987, 08/20/1991, 08/08/1997, 08/07/2003, 08/11/2008, 07/17/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter; Sage-Grouse, Habitat Winter

#### VEGETATION HISTORY--

Management unit 24, Study no: 1

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Wyoming Big Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

In order to access the site the East Fork of the Sevier River needs to be crossed. Seasonal water levels may limit access to the study site.

### Site Potential

1981-2010 Average Annual Precipitation 7 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Borollic Calciorthids  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB220UT

#### SOIL ANALYSIS DATA--

Management unit 24, Study no: 1

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	52.7	22.7	24.6	6.8	1.2	1.3	12.3	188.8	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

The site has remained in a stable state since establishment in 1987. The site has maintained a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with a herbaceous understory dominated by blue grama (*Bouteloua gracilis*), both of which have remained the dominant cover types over the duration of the study. Introduced annual grass and forb species have been limited on the site (Table - Browse Trends, Table - Herbaceous Trends). Without disturbance, this site is likely to remain in a stable state with sagebrush being the dominant component of the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 24, study no: 1

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	8.1	11.4	15.0	14.1	0.0	0.0	0.0	<b>48.6</b>	Good
2003	7.6	-9.0	4.0	30.0	0.0	0.1	0.0	<b>32.6</b>	Fair
2008	8.5	0.3	4.0	30.0	0.0	0.0	0.0	<b>42.8</b>	Fair
2013	12.4	9.9	4.0	30.0	0.0	0.0	0.0	<b>56.3</b>	Good

## HERBACEOUS TRENDS--

Management unit 24, Study no: 1

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Bouteloua gracilis</i>	a235	a279	b324	b325	7.00	18.33	28.21	15.42
G	<i>Oryzopsis hymenoides</i>	-	-	-	-	.00	-	.01	-
G	<i>Sporobolus cryptandrus</i>	a1	ab14	b21	ab5	.01	.38	.46	.05
G	<i>Stipa comata</i>	a1	a-	b9	a-	.00	-	.14	.00
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		237	293	354	330	7.03	18.71	28.83	15.48
Total for Grasses		237	293	354	330	7.03	18.71	28.83	15.48
F	<i>Astragalus utahensis</i>	2	-	-	-	.01	-	-	-
F	<i>Chenopodium fremontii</i> (a)	b213	a-	a-	ab7	6.01	-	-	.04
F	<i>Chenopodium leptophyllum</i> (a)	b121	a1	a-	a6	1.19	.03	-	.06
F	<i>Eriogonum cernuum</i> (a)	b86	a2	a-	a-	1.09	.03	-	-
F	<i>Lappula occidentalis</i> (a)	b26	ab10	a-	a-	.05	.04	-	-
F	<i>Sphaeralcea grossulariifolia</i>	-	2	-	2	-	.03	-	.00
Total for Annual Forbs		446	13	0	13	8.35	0.11	0	0.11
Total for Perennial Forbs		2	2	0	2	0.01	0.03	0	0.00
Total for Forbs		448	15	0	15	8.37	0.14	0	0.11

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

## BROWSE TRENDS--

Management unit 24, Study no: 1

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata wyomingensis</i>	6.47	6.05	6.76	9.91	5.01	10.73	13.48
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	-	.03	.00	-	-	-	-
B	<i>Gutierrezia sarothrae</i>	-	-	-	.03	-	-	-
B	<i>Sclerocactus</i> sp.	-	-	-	.00	-	-	-
Total for Browse		6.47	6.08	6.77	9.94	5.01	10.73	13.48



**BASIC COVER--**

Management unit 24, Study no: 1

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	21.55	25.59	37.65	24.37
Rock	7.22	9.19	7.33	5.48
Pavement	20.33	21.87	15.70	12.21
Litter	16.26	17.27	21.90	20.63
Cryptogams	.18	.22	.08	.04
Bare Ground	29.45	31.46	26.86	42.67

**PELLET GROUP DATA--**

Management unit 24, Study no: 1

Type	Quadrat Frequency				Days use per acre (ha)		
	'97	'03	'08	'13	'03	'08	'13
Rabbit	7	19	57	7	-	-	-
Elk	1	-	-	-	-	5 (13)	-
Deer	20	15	36	13	42 (104)	21 (51)	5 (12)
Cattle	5	5	10	2	20 (48)	38 (95)	9 (23)

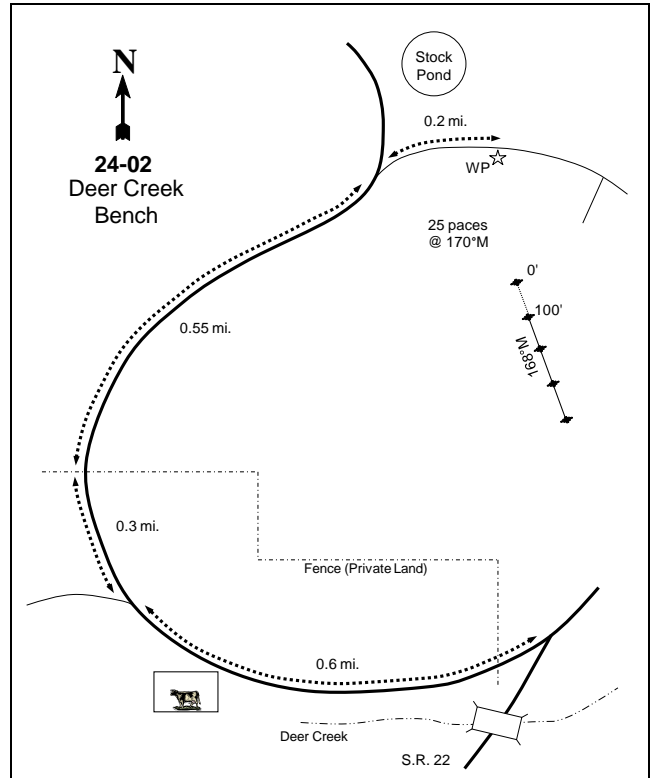
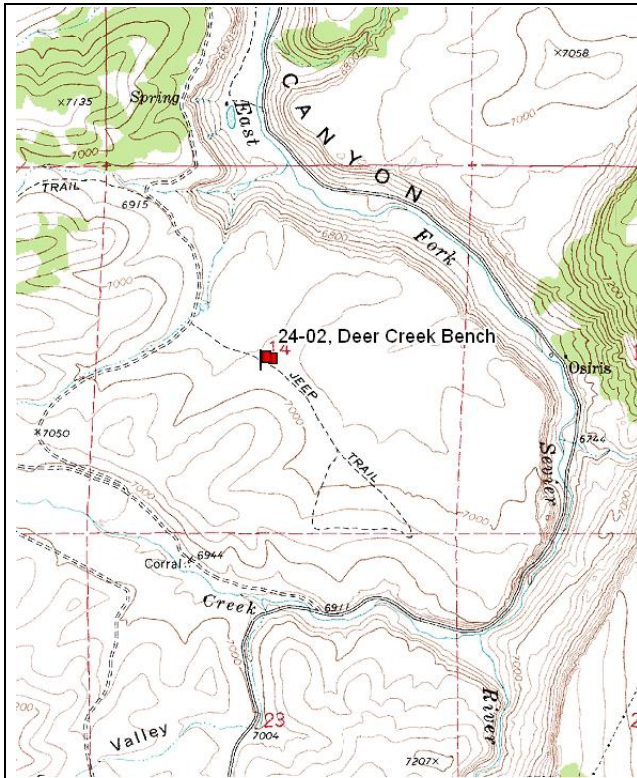
**BROWSE CHARACTERISTICS--**

Management unit 24, Study no: 1

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>									
97	<b>4420</b>	39	49	12	360	8	.45	8	18/26
03	<b>3020</b>	8	12	80	-	28	5	45	15/20
08	<b>3380</b>	8	43	49	60	52	6	15	15/23
13	<b>2620</b>	8	76	17	6660	25	26	19	19/31
<i>Ceratoides lanata</i>									
97	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>40</b>	0	50	50	-	0	100	0	12/10
08	<b>40</b>	0	50	50	-	0	100	0	7/8
13	<b>20</b>	0	100	0	-	100	0	0	7/9
<i>Chrysothamnus nauseosus</i>									
97	<b>80</b>	0	100	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	0	0	6/4
08	<b>20</b>	0	100	-	-	0	0	0	6/7
13	<b>0</b>	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
97	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
97	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	5/10	
13	<b>0</b>	0	0	-	-	0	0	0	5/13	
<i>Sclerocactus sp.</i>										
97	<b>60</b>	67	33	-	-	0	0	0	11/11	
03	<b>0</b>	0	0	-	-	0	0	0	1/2	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	100	0	-	-	0	0	0	1/2	

DEER CREEK BENCH - TREND STUDY NO. 24-2



**Location Information**

USGS 7.5 min Map Info      Antimony; Township 32S, Range 2W, Section 14  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 414266 East 4208657 North

**Transect Information**

Browse Tag # (0' Stake)      9100  
 Transect Bearing              168° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

From SR 22 in the southern end of Black Canyon, follow the highway up Deer Creek to a bridge. Immediately north of the bridge, make a hard left. Take the road that crosses private land and travel northwest for 0.6 miles passing a corral at a fork. Bear right, go 0.3 miles to a fence. Continue 0.55 miles to a fork by a stockpond. Turn right onto a jeep trail and proceed 0.2 miles to the study area. There is a witness post located on the right side of the road. Walk approximately 25 paces at a bearing of 170 degrees magnetic to the 0-foot baseline stake. The study is marked by 2-foot tall fence posts. The 0-stake is marked by browse tag #9100. The transect runs south up the hill.

### Site Information

Land Ownership BLM  
Allotment Pine Creek Antimony  
Elevation 6,980ft (2,128m)  
Aspect North  
Slope 11-15%  
Sample Dates 08/07/1987, 08/20/1991, 08/11/1997, 07/31/2003, 08/07/2008, 07/16/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter; Pronghorn, Crucial Winter; Sage-Grouse, Habitat Winter

#### VEGETATION HISTORY--

Management unit 24, Study no: 2

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Black Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

A few antler sheds have been found on the site. Escape and thermal cover are not present on the site, but is located quarter mile to the west. Water sources near the study site include a stock pond a quarter mile to the north and Deer Creek located three-quarters of a mile to the south.

### Site Potential

1981-2010 Average Annual Precipitation 9 inches  
NRCS Taxonomical soil Classification Fine-loamy, mixed Borollic Calciorthids  
NRCS Ecological Site Semidesert Loam (Black Sagebrush)  
NRCS Ecological Site # R047XB221UT

#### SOIL ANALYSIS DATA--

Management unit 24, Study no: 2

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	61.0	23.1	15.9	7.1	0.5	1.8	13.6	92.8	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

Since the establishment of the study in 1987, the site has maintained a stable stand of black sagebrush (*Artemisia nova*). The herbaceous understory lacks diversity, but the perennial grass species bottle-brush squirreltail (*Sitanion hystrix*) and Indian ricegrass (*Oryzopsis hymenoides*) are common on the site and have maintained stable populations. However, the perennial grass species needle-and-thread (*Stipa comata*) has increased in frequency and cover over the duration of the study. The introduced annual grass species cheatgrass (*Bromus tectorum*) has remained limited on the site. The perennial and annual forb communities remain unremarkable (Table - Browse Trends, Table - Herbaceous Trends). Without a disturbance, this site is likely to remain in a stable state with sagebrush being the dominant component of the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 24, study no: 2

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	22.3	10.8	6.4	7.9	0.0	1.1	0.0	<b>48.5</b>	Good
2003	22.8	8.1	0.5	13.8	0.0	0.9	0.0	<b>46.1</b>	Fair-Good
2008	21.5	3.9	1.9	17.6	0.0	1.4	0.0	<b>46.2</b>	Fair-Good
2013	21.4	10.9	3.4	22.5	0.0	2.4	0.0	<b>60.6</b>	Good

## HERBACEOUS TRENDS--

Management unit 24, Study no: 2

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Bromus tectorum (a)	ab3	a2	b20	ab9	.00	.00	.03	.02
G	Oryzopsis hymenoides	a79	ab103	b123	b103	2.04	4.46	4.24	4.36
G	Sitanion hystrix	ab104	bc146	a99	c160	1.66	1.92	1.51	3.17
G	Stipa comata	a15	a29	b132	b114	.26	.49	3.03	3.73
Total for Annual Grasses		3	2	20	9	0.00	0.00	0.03	0.02
Total for Perennial Grasses		198	278	354	377	3.96	6.88	8.79	11.27
Total for Grasses		201	280	374	386	3.97	6.88	8.82	11.29
F	Antennaria sp.	2	-	6	-	.00	-	.01	-
F	Arabis demissa	ab5	a-	ab4	b15	.01	-	.03	.03
F	Astragalus calycosus	4	-	-	8	.01	-	-	.04
F	Astragalus purshii	7	-	-	12	.01	-	-	.06
F	Castilleja sp.	-	-	3	-	-	-	.00	-
F	Chenopodium leptophyllum(a)	-	-	3	3	-	-	.01	.00
F	Chenopodium sp. (a)	19	-	-	-	.04	-	-	-
F	Cryptantha sp.	-	-	-	3	-	-	-	.01
F	Descurainia pinnata (a)	a-	b15	ab6	a-	-	.08	.01	-
F	Erigeron pumilus	b43	a8	b40	c69	.31	.05	.20	.40
F	Gayophytum ramosissimum(a)	c37	ab11	a-	a3	.08	.03	-	.00
F	Phlox hoodii	a-	b13	b17	b26	-	.06	.26	.48
F	Phlox longifolia	a6	ab13	a5	b28	.01	.05	.04	.09
F	Sphaeralcea coccinea	34	37	34	26	.20	.26	.13	.08
F	Trifolium sp.	-	-	4	-	-	-	.00	-
Total for Annual Forbs		56	26	9	6	0.12	0.11	0.02	0.01
Total for Perennial Forbs		101	71	113	187	0.57	0.43	0.70	1.20
Total for Forbs		157	97	122	193	0.69	0.54	0.72	1.21

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

BROWSE TRENDS--

Management unit 24, Study no: 2

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia nova	16.66	17.48	16.36	15.71	17.90	19.41	17.75
B	Artemisia pygmaea	.82	.88	.72	.70	.73	.78	1.73
B	Ceratoides lanata	-	.03	.03	.18	-	-	-
B	Chrysothamnus viscidiflorus stenophyllus	2.23	3.06	2.32	2.75	2.60	2.34	3.58
B	Eriogonum microthecum	1.15	.76	.81	1.23	.21	.95	1.36
B	Gutierrezia sarothrae	-	.45	.06	.09	.70	.08	.31
B	Opuntia sp.	-	-	-	.00	-	-	-
B	Pediocactus simpsonii	-	.01	-	-	-	-	-
Total for Browse		20.87	22.68	20.30	20.68	22.14	23.56	24.73

BASIC COVER--

Management unit 24, Study no: 2

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	25.71	28.83	29.66	30.41
Rock	11.87	17.70	16.43	21.99
Pavement	27.52	27.36	30.75	20.50
Litter	16.73	18.10	19.31	21.79
Cryptogams	.34	.65	.66	.52
Bare Ground	13.28	14.39	11.96	16.38

PELLET GROUP DATA--

Management unit 24, Study no: 2

Type	Quadrat Frequency			
	'97	'03	'08	'13
Rabbit	2	11	48	3
Grouse	-	2	2	10
Elk	3	3	4	-
Deer	46	34	47	30
Cattle	3	6	4	-

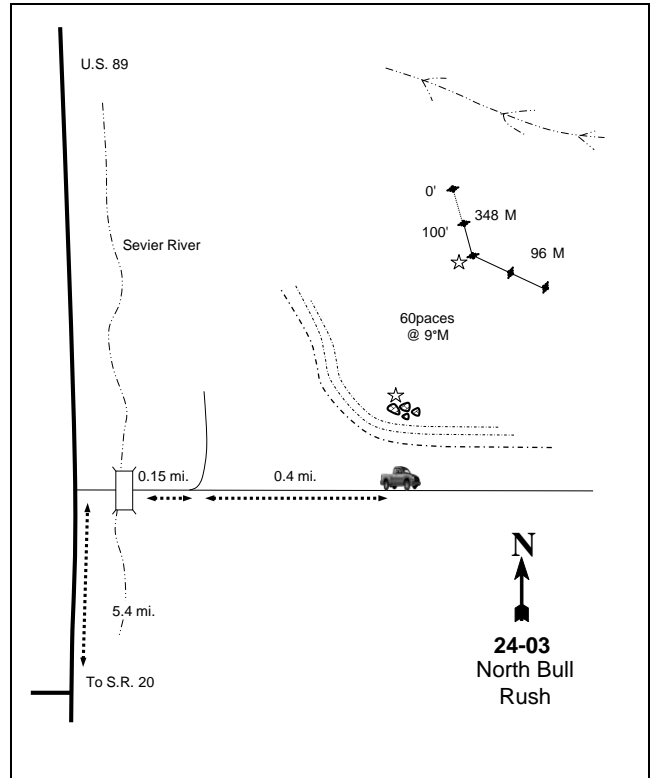
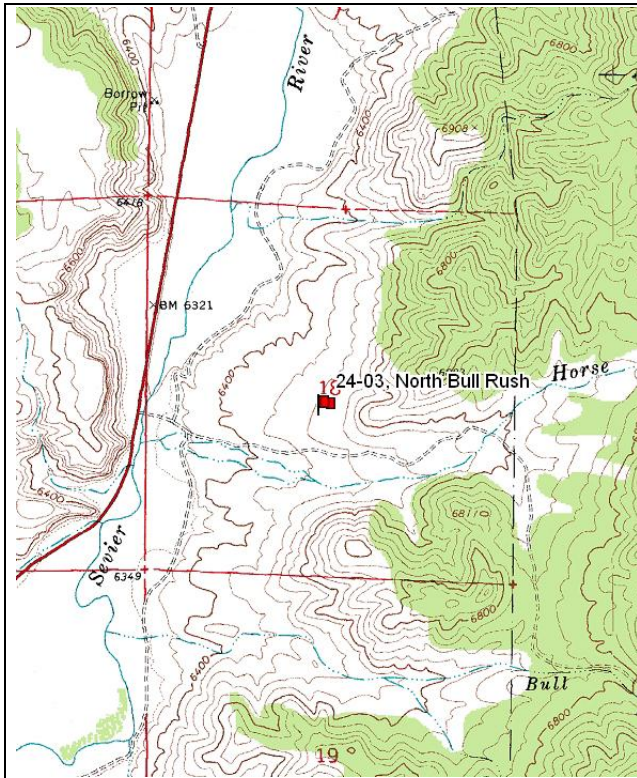
Days use per acre (ha)			
'97	'03	'08	'13
-	-	-	-
-	-	6 groups/acre	26 groups/acre
8 (20)	-	1 (2)	-
121 (299)	64 (159)	60 (147)	74 (184)
6 (15)	8 (20)	5 (13)	4 (11)

BROWSE CHARACTERISTICS--

Management unit 24, Study no: 2

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 nova</i>									
97	<b>5980</b>	13	72	15	220	31	5	7	12/23
03	<b>8760</b>	1	74	24	-	18	0	4	11/22
08	<b>6760</b>	4	57	39	280	38	12	10	10/23
13	<b>6180</b>	7	78	15	180	41	35	19	9/20
<i>Artemisia pygmaea</i>									
97	<b>2500</b>	6	94	0	100	24	0	0	2/7
03	<b>3220</b>	2	94	4	-	.62	0	0	2/6
08	<b>3280</b>	1	67	32	-	0	0	0	1/6
13	<b>3200</b>	4	96	0	40	54	0	0	1/5
<i>Ceratoides lanata</i>									
97	<b>20</b>	0	100	-	-	100	0	0	4/8
03	<b>60</b>	0	100	-	-	0	100	0	3/4
08	<b>20</b>	0	100	-	-	0	100	0	4/6
13	<b>60</b>	0	100	-	-	0	33	0	4/8
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
97	<b>3060</b>	5	94	1	-	1	0	.65	6/12
03	<b>3360</b>	1	89	11	-	0	0	3	6/12
08	<b>2940</b>	0	72	28	80	7	0	8	6/11
13	<b>2360</b>	2	97	1	-	26	4	29	5/13
<i>Eriogonum microthecum</i>									
97	<b>5600</b>	11	89	-	180	4	0	0	3/5
03	<b>7620</b>	3	97	-	-	11	2	0	2/4
08	<b>6280</b>	0	100	-	40	5	.95	0	2/3
13	<b>6100</b>	4	96	-	20	.32	2	0	2/4
<i>Gutierrezia sarothrae</i>									
97	<b>80</b>	0	100	0	-	0	0	0	8/7
03	<b>1920</b>	10	90	0	20	0	0	0	6/5
08	<b>500</b>	0	96	4	-	0	0	4	6/8
13	<b>700</b>	51	49	0	40	0	0	0	5/6
<i>Opuntia sp.</i>									
97	<b>80</b>	0	100	0	-	0	0	0	4/4
03	<b>100</b>	0	100	0	-	0	0	0	4/9
08	<b>40</b>	0	50	50	-	0	0	50	4/11
13	<b>60</b>	0	100	0	-	0	0	0	5/9
<i>Pediocactus simpsonii</i>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	0	0	0/1
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-

## NORTH BULL RUSH - TREND STUDY NO. 24-3



### Location Information

USGS 7.5 min Map Info      Bull Rush Peak; Township 32S, Range 4.5W, Section 18  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 381623 East 4209809 North

### Transect Information

Browse Tag # (0' Stake)      168  
 Transect Bearing              348° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

### Directions to Site

From the US 89 and SR 20 Junction, proceed north on 89 for 5.4 miles. Here at the beginning of Circleville Canyon, turn right off the highway onto a dirt road. Cross the Sevier River, and go 0.15 miles to a gate and intersection (bridge was washed out-may need to walk in). Go straight (east) for another 0.4 miles. Stop here. Walk 18 paces up on the edge of a low bench on the north side of the road at 356 degrees magnetic to a rock monument with a fencepost. Walk approximately 60 paces at 9 degree magnetic to the 200' baseline stake. The 0' stake is located at 348 degrees magnetic from the 200' stake. The 0' stake is marked by browse tag #168.



**Site Information**

Land Ownership BLM  
 Allotment Hawkins Wash  
 Elevation 6,480ft (1,975m)  
 Aspect Northwest  
 Slope 3-5%  
 Sample Dates 08/19/1987, 08/22/1991, 08/11/1997, 07/10/2003, 07/10/2008, 07/16/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Sage-Grouse, Habitat Winter

VEGETATION HISTORY--

Management unit 24, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Wyoming Big Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The bridge to cross the Sevier River was washed out, but has since been replaced with a new steel bridge. If there is a problem with access, the site can still be accessed by walking in. Antler drops were found on the site in 1991. The closest water sources are Bull Rush Creek and Sevier River at approximately one-half mile to the south and west of the site, respectively.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed Aridic Argiborolls  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

SOIL ANALYSIS DATA--

Management unit 24, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	60.4	20.1	19.6	6.7	0.6	1.4	7.1	208.0	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since the establishment of the study in 1987, the site has maintained a stable stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), though density has decreased since 1997 (Table - Browse trends). The herbaceous understory has been comprised of the perennial grass species blue grama (*Bouteloua gracilis*) and needle-and-thread (*Stipa comata*). Both annual and perennial forb communities have lacked diversity and have been sampled infrequently across the site (Table - Herbaceous Trends). Without a disturbance, this site is likely to remain in a stable state with sagebrush being the dominant component of the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 24, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	17.1	0.6	1.5	20.4	0.0	0.1	0.0	<b>39.7</b>	Fair
2003	11.3	-1.2	0.0	24.3	0.0	0.0	0.0	<b>34.4</b>	Fair
2008	9.7	-5.7	0.5	30.0	0.0	0.0	0.0	<b>34.5</b>	Fair
2013	12.3	6.0	11.0	30.0	0.0	0.0	0.0	<b>59.3</b>	Good

## HERBACEOUS TRENDS--

Management unit 24, Study no: 3

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Agropyron intermedium	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>5</sup>	-	-	-	.15
G	Bouteloua gracilis	a <sup>123</sup>	ab <sup>149</sup>	b <sup>168</sup>	a <sup>128</sup>	1.88	5.16	8.56	1.77
G	Bromus tectorum (a)	-	-	-	-	.00	-	-	-
G	Sitanion hystrix	b <sup>38</sup>	a <sup>4</sup>	a <sup>7</sup>	a <sup>7</sup>	.70	.05	.13	.07
G	Sporobolus cryptandrus	b <sup>10</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>2</sup>	.10	-	-	.00
G	Stipa comata	a <sup>273</sup>	a <sup>254</sup>	b <sup>329</sup>	b <sup>368</sup>	7.52	6.94	9.78	13.31
Total for Annual Grasses		0	0	0	0	0.00	0	0	0
Total for Perennial Grasses		444	407	504	510	10.21	12.15	18.48	15.32
Total for Grasses		444	407	504	510	10.21	12.15	18.48	15.32
F	Astragalus sp.	7	-	1	-	.01	-	.00	-
F	Chenopodium sp. (a)	b <sup>11</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.03	-	-	-
F	Descurainia pinnata (a)	a <sup>-</sup>	b <sup>9</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.10	-	-
F	Draba sp. (a)	-	1	-	-	-	.00	-	-
F	Erigeron pumilus	b <sup>7</sup>	a <sup>-</sup>	a <sup>-</sup>	ab <sup>3</sup>	.03	-	-	.00
F	Gilia sp. (a)	3	-	-	-	.00	-	-	-
Total for Annual Forbs		14	10	0	0	0.03	0.11	0	0
Total for Perennial Forbs		14	0	1	3	0.04	0	0.00	0.00
Total for Forbs		28	10	1	3	0.07	0.11	0.00	0.00

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

BROWSE TRENDS--

Management unit 24, Study no: 3

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	13.67	9.01	7.76	9.81	9.81	9.50	9.80
B	Chrysothamnus viscidiflorus stenophyllus	.15	.15	-	-	.16	.03	-
B	Opuntia sp.	.18	.15	-	-	-	-	-
B	Pediocactus simpsonii	-	-	.00	.00	-	-	-
Total for Browse		14.00	9.30	7.76	9.81	9.97	9.53	9.80

BASIC COVER--

Management unit 24, Study no: 3

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	25.75	22.20	27.52	26.59
Rock	1.44	3.08	3.89	1.27
Pavement	35.46	39.82	35.78	28.78
Litter	28.81	22.23	33.69	27.23
Cryptogams	.72	.30	.20	.22
Bare Ground	17.67	19.65	7.57	22.96

PELLET GROUP DATA--

Management unit 24, Study no: 3

Type	Quadrat Frequency				Days use per acre (ha)		
	'97	'03	'08	'13	'03	'08	'13
Rabbit	8	53	96	-	-	-	-
Horse	-	-	-	-	-	1 (1)	-
Elk	4	2	-	1	-	-	1 (2)
Deer	41	16	9	6	27 (66)	42 (104)	11 (28)
Cattle	3	13	10	12	25 (63)	52 (127)	9 (23)

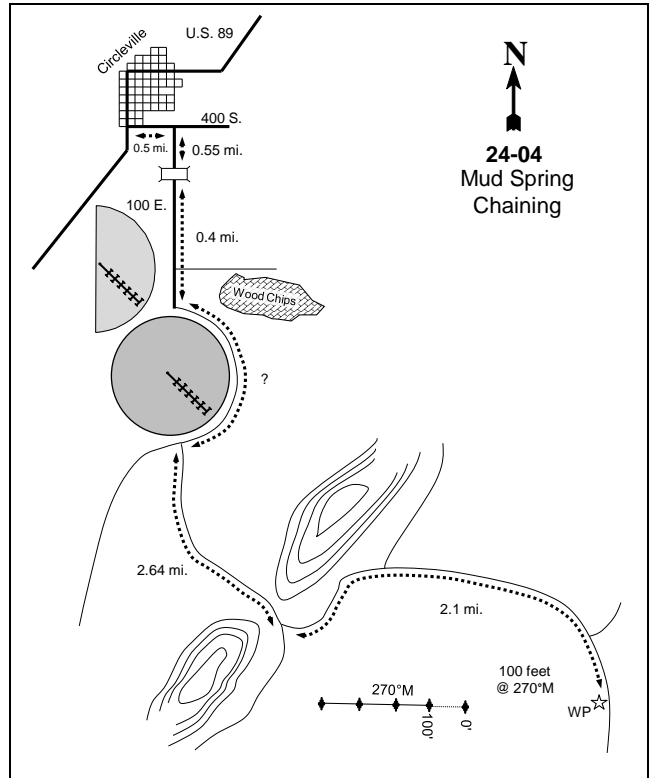
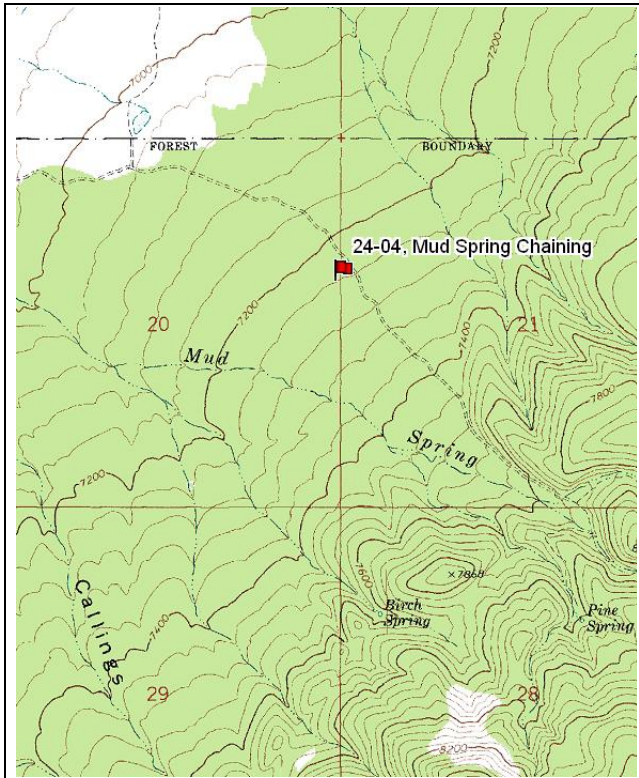
BROWSE CHARACTERISTICS--

Management unit 24, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Artemisia tridentata wyomingensis									
97	<b>5800</b>	3	49	48	200	60	7	16	15/28
03	<b>5440</b>	0	46	54	-	23	0	18	16/24
08	<b>3540</b>	1	31	69	60	37	25	38	18/30
13	<b>4620</b>	22	149	30	1380	41	21	19	18/28

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Ceratoides lanata</i>										
97	20	0	100	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	100	0	7/4	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
97	100	0	100	0	-	0	0	0	8/11	
03	80	0	75	25	-	0	0	25	9/9	
08	20	0	0	100	-	0	0	100	-/-	
13	0	0	0	0	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
97	60	0	100	-	-	0	0	0	6/13	
03	40	0	100	-	-	0	0	50	4/15	
08	0	0	0	-	-	0	0	0	4/12	
13	0	0	0	-	-	0	0	0	-/-	
<i>Pediocactus simpsonii</i>										
97	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	1/3	
08	20	100	0	-	-	0	0	0	-/-	
13	40	0	100	-	20	0	0	0	1/2	

MUD SPRING CHAINING - TREND STUDY NO. 24-4



**Location Information**

USGS 7.5 min Map Info Mount Dutton; Township 31S, Range 3W, Section 20  
 GPS (0' Stake) NAD 83, UTM Zone 12, 393773 East 4218029 North

**Transect Information**

Browse Tag # (0' Stake) 7887  
 Transect Bearing 270° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Belt 1: 5ft

**Directions to Site**

Heading south on U.S. 89 in Circleville, turn left (east) onto 400 south. Drive for 0.5 miles and turn right (south) onto 100 east. After 0.55 miles there will be a bridge, continue for another 0.4 miles. At this point the road will curve around a pivot (crop circle); about half way around the circle there will be a road that heads south. Take this road and drive for 2.64 miles at which point the road will fork. Proceed on the left fork for 2.1 miles at which point it crosses under a high tension power-line. Stop here. The pole (# 327) nearest the road has a red browse tag #7046 attached under a yellow reflector. Walk 300 feet due west to the first frequency baseline stake. The 0-foot stake is a 2-1/2 foot tall rebar tagged #7887. There is an unmarked pellet group transect nearby.

**Site Information**

Land Ownership USFS  
 Allotment Jones Corral C&H  
 Elevation 7,230ft (2,204m)  
 Aspect Northwest  
 Slope 5%  
 Sample Dates 08/20/1987, 07/12/1991, 8/13/1997, 07/11/2003, 08/06/2008, 7/16/2013

**DISTURBANCE HISTORY--**

Management unit 24, Study no: 4

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-
Lop and Scatter	-	-	2003-2008	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation and Habitat Information**

Wildlife Habitat Deer, Crucial Winter, Elk, Substantial Year-long

**VEGETATION HISTORY--**

Management unit 24, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1991	Mountain Big Sagebrush	Phase I
1997-2003	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2008-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Sign of wildlife within the study area has been minimal over the duration of the study. Escape and thermal cover for wildlife is found nearby in untreated pinyon-juniper woodlands, which surrounds the treatment area.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Typic Argiborolls  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

**SOIL ANALYSIS DATA--**

Management unit 24, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	67.0	18.4	14.6	6.9	0.5	3.6	38.4	608.0	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1987, the site was a stand of mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*) with Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus edulis*) punctuated across the site. Pinyon and juniper trees continued to encroach on the site from 1987 to 2003 (Table - Browse Characteristics, Table - Browse Trends). The majority of the pinyon and juniper trees were removed from the site between 2003 and 2008. Sagebrush has been the main component of the shrub layer on the site over the sample years (Table -

Browse Trends). The introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) has remained the major component of the herbaceous understory over the duration of the study (Table - Herbaceous Trends). Without a disturbance and/or re-encroachment of pinyon and juniper trees, this site will likely remain in a stable state with sagebrush being the dominant component of the site.

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 24, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	7.8	12.6	13.5	22.7	0.0	0.5	0.0	<b>57.1</b>	Fair
2003	9.2	6.0	8.0	16.6	0.0	0.1	0.0	<b>39.9</b>	Poor
2008	9.6	10.5	0.0	25.7	0.0	0.2	0.0	<b>46.0</b>	Poor
2013	13.2	13.8	7.0	27.1	0.0	0.4	0.0	<b>61.5</b>	Fair

### HERBACEOUS TRENDS--

Management unit 24, Study no: 4

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Agropyron cristatum</i>	<sub>b</sub> 305	<sub>ab</sub> 263	<sub>a</sub> 256	<sub>ab</sub> 281	11.16	8.13	12.27	13.15
G	<i>Aristida purpurea</i>	-	4	6	-	-	.04	.06	-
G	<i>Bouteloua gracilis</i>	11	10	15	12	.05	.10	.17	.21
G	<i>Carex</i> sp.	9	-	-	4	.02	-	-	.03
G	<i>Oryzopsis hymenoides</i>	3	-	-	7	.03	-	-	.06
G	<i>Sitanion hystrix</i>	<sub>a</sub> 10	<sub>a</sub> 5	<sub>b</sub> 19	<sub>a</sub> 5	.07	.04	.32	.06
G	<i>Stipa comata</i>	2	-	-	1	.00	.00	-	.03
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		340	282	296	310	11.34	8.32	12.83	13.56
Total for Grasses		340	282	296	310	11.34	8.32	12.83	13.56
F	<i>Arabis</i> sp.	<sub>b</sub> 7	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.01	-	-	-
F	<i>Astragalus</i> sp.	-	3	4	-	-	.00	.00	-
F	<i>Chaenactis douglasii</i>	-	-	4	-	-	-	.04	-
F	<i>Cryptantha</i> sp.	4	-	-	-	.01	-	-	-
F	<i>Cymopterus</i> sp.	-	1	-	-	-	.00	-	-
F	<i>Descurainia pinnata</i> (a)	-	3	-	-	-	.00	-	-
F	<i>Erigeron pumilus</i>	2	-	4	6	.01	-	.01	.04
F	<i>Hymenopappus filifolius</i>	<sub>b</sub> 24	<sub>a</sub> 9	<sub>a</sub> 1	<sub>a</sub> 9	.22	.04	.03	.12
F	<i>Lotus utahensis</i>	-	-	-	3	-	-	-	.00
F	<i>Machaeranthera canescens</i>	2	1	-	-	.00	.00	-	-
F	<i>Phlox hoodii</i>	-	-	-	1	-	-	-	.03
F	<i>Streptanthus cordatus</i>	-	1	1	2	-	.00	.00	.00
Total for Annual Forbs		0	3	0	0	0	0.00	0	0
Total for Perennial Forbs		39	15	14	21	0.26	0.06	0.09	0.20
Total for Forbs		39	18	14	21	0.26	0.06	0.09	0.20

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

BROWSE TRENDS--

Management unit 24, Study no: 4

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	6.21	7.33	7.70	10.55	5.05	9.14	10.00
B	Chrysothamnus nauseosus	-	-	-	1.20	-	.26	.13
B	Eriogonum microthecum	.00	.00	-	-	-	-	-
B	Gutierrezia sarothrae	.08	.34	.39	.07	.20	.43	.21
B	Juniperus osteosperma	.03	4.46	.56	1.01	4.98	.61	2.20
B	Opuntia sp.	.03	.15	.01	.00	-	-	-
B	Pinus edulis	5.18	8.68	.00	.15	12.80	.46	-
B	Yucca sp.	.03	.15	.38	.38	-	-	-
Total for Browse		11.58	21.12	9.05	13.37	17.98	10.9	12.54

POINT-QUARTER TREE DATA--

Management unit 24, Study no: 4

Species	Trees per Acre				Average diameter (in)			
	'97	'03	'08	'13	'97	'03	'08	'13
Juniperus osteosperma	127	104	59	65	4.2	5.2	2.9	2.1
Pinus edulis	90	123	34	35	3.0	2.6	2.0	1.8

BASIC COVER--

Management unit 24, Study no: 4

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	26.82	28.81	21.45	26.66
Rock	18.86	23.96	17.91	20.80
Pavement	13.49	12.83	13.62	5.96
Litter	37.68	34.77	45.72	46.62
Cryptogams	.06	.39	.13	.06
Bare Ground	14.53	16.46	12.28	9.83

PELLET GROUP DATA--

Management unit 24, Study no: 4

Type	Quadrat Frequency				Days use per acre (ha)		
	'97	'03	'08	'13	'03	'08	'13
Rabbit	9	16	51	1	-	-	
Elk	-	1	1	1	-	2 (5)	4 (10)
Deer	8	5	20	2	7 (18)	5 (12)	3 (7)
Cattle	3	2	5	1	9 (23)	4 (11)	6 (14)



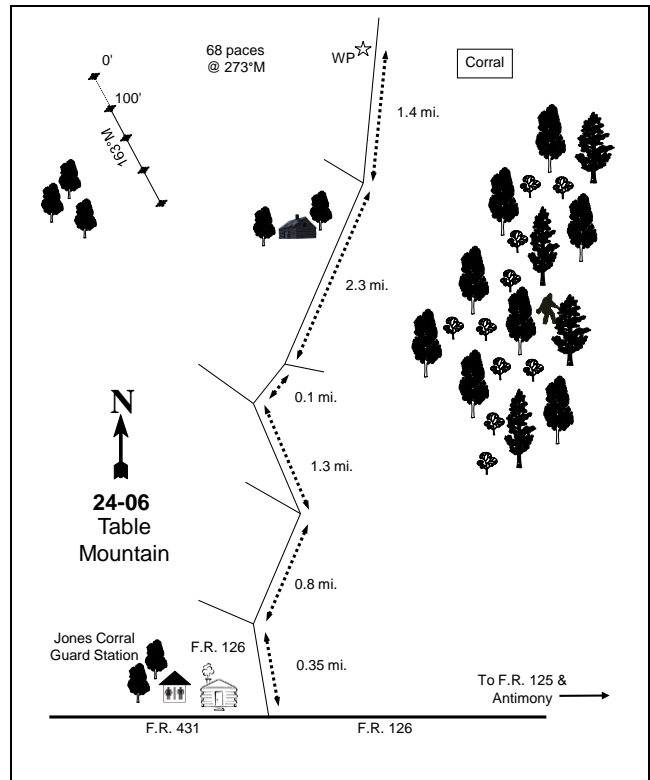
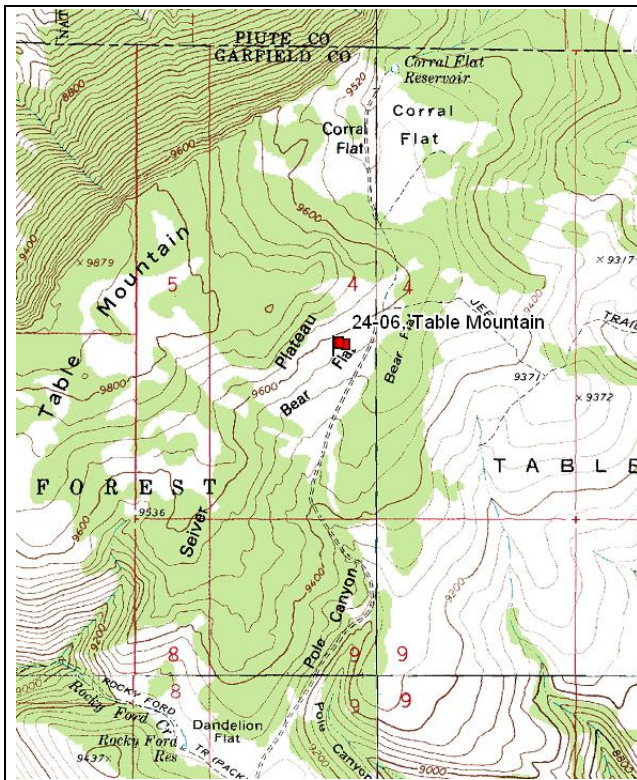
BROWSE CHARACTERISTICS--

Management unit 24, Study no: 4

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
97	1040	27	65	8	180	23	2	8	22/37	
03	1220	16	54	30	-	15	8	18	19/28	
08	1320	0	85	15	20	41	29	8	23/36	
13	1380	14	81	4	60	28	1	0	25/41	
<i>Chrysothamnus nauseosus</i>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	24/21	
08	40	0	100	-	-	0	0	0	14/16	
13	40	0	100	-	-	50	0	0	21/33	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	13/18	
08	0	0	0	-	-	0	0	0	15/21	
13	0	0	0	-	-	0	0	0	-/-	
<i>Eriogonum microthecum</i>										
97	20	100	0	-	-	0	0	0	-/-	
03	40	0	100	-	-	0	0	0	4/4	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
97	260	8	85	8	-	0	0	0	8/12	
03	760	0	71	29	20	0	0	11	7/9	
08	800	3	83	15	120	0	0	13	6/8	
13	660	18	79	3	60	0	0	3	6/9	
<i>Juniperus osteosperma</i>										
97	100	20	80	-	20	0	0	20	-/-	
03	220	27	73	-	-	0	0	0	-/-	
08	80	25	75	-	-	0	0	25	-/-	
13	100	40	60	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
97	60	67	33	-	-	0	0	0	6/8	
03	120	0	100	-	-	0	0	0	4/10	
08	60	0	100	-	20	0	0	0	3/3	
13	40	0	100	-	-	0	0	0	3/8	
<i>Pediocactus simpsonii</i>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	2/2	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	2/2	

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>Pinus edulis</i>									
97	<b>280</b>	21	79	-	-	0	0	0	-/-
03	<b>240</b>	8	92	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	-/-
13	<b>20</b>	0	100	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
97	<b>20</b>	0	100	-	-	100	0	0	23/52
03	<b>20</b>	0	100	-	-	0	100	0	30/44
08	<b>40</b>	0	100	-	-	50	50	0	18/44
13	<b>40</b>	50	50	-	-	100	0	0	23/39
<i>Sclerocactus sp.</i>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	4/12
13	<b>0</b>	0	0	-	-	0	0	0	5/15
<i>Yucca sp.</i>									
97	<b>20</b>	0	100	-	-	0	0	0	7/15
03	<b>40</b>	0	100	-	-	0	0	0	20/24
08	<b>20</b>	0	100	-	-	0	0	0	12/23
13	<b>20</b>	0	100	-	-	0	0	0	22/40

TABLE MOUNTAIN - TREND STUDY NO. 24-6



**Location Information**

USGS 7.5 min Map Info      Junction; Township 31S, Range 2.5W, Section 4  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 401158 East 4221670 North

**Transect Information**

Browse Tag # (0' Stake)      9004  
 Transect Bearing              163° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

Starting from the Jones Corral Guard Station, head north on road 126 for 0.35 miles (towards Table Mountain). At the fork, stay right and continue 0.8 miles to another fork. Stay right and continue 1.3 miles to a fork and cattle-guard. Keep right and go 0.1 miles to another fork. Bear left and continue 2.3 miles to a fork. Stay right and continue north for 1.4 miles to a burned flat surrounded by aspens. Look for a 4ft tall witness post on the left side of the road. From the witness post walk 68 paces at 277 degrees magnetic to the 0'stake. The 0-foot baseline stake is marked by a red browse tag #9004.

**Site Information**

Land Ownership USFS  
 Allotment Deer Creek S&G  
 Elevation 9,560ft (2,914m)  
 Aspect Northwest  
 Slope 7-9%  
 Sample Dates 08/11/2987, 08/24/1991, 08/15/1997, 08/07/2003, 08/07/2008,07/17/2013

**DISTURBANCE HISTORY--**

Management unit 24, Study no: 6

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Prescribe Fire	-	-	Prior to 1987	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer; Elk, Substantial Summer, Calving; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 24, Study no: 6

Year	Vegetation Type <sup>1</sup>
1987-2003	Perennial Grass-Forb
2008-2013	Mountain Big Sagebrush/Snowberry

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

Stands of quaking aspen (*Populus tremuloides*) are found near the site and provide escape cover for wildlife. Pellet group data suggests presence of both deer and elk have varied since 1997. This area is part of a sheep allotment that was rested for a time, but sheep were seen on site in 2003 with high pellet group counts (Table - Pellet Group Data). Bare ground cover has been consistently low with a high amount of vegetation and litter providing protective ground cover (Table-Basic Cover). The soil erosion condition has been stable since 2003.

**Site Potential**

1981-2010 Average Annual Precipitation 24 inches  
 NRCS Taxonomical soil Classification Clayey-skeletal, montmorillonitic Boralfic Cryoborolls  
 NRCS Ecological Site High Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB516UT

**SOIL ANALYSIS DATA--**

Management unit 24, Study no: 6

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	38.4	35.1	26.6	6.1	0.6	5.0	47.1	454.4	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [High Mountain Loam \(Mountain Big Sagebrush\), R047XA516UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

At the time of site establishment in 1987, repeat photographs show that the area likely burned during a prescribed fire (Table - Disturbance History). As a result, the site transitioned from a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) community to a perennial grass community dominated by Letterman needlegrass (*Stipa lettermanii*) (Appendix B -Pre-1992 Data, Table - Herbaceous Trends). The perennial grass and forb community has remained abundant over the duration of the study, though the site transitioned from a perennial grass and forb community to a mountain big sagebrush and mountain snowberry (*Symphoricarpos oreophilus*) community in 2003. Sagebrush and snowberry has increased in density and cover over the sample years (Table - Browse Trends). Without a disturbance, this site is likely to remain in a stable state with sagebrush and snowberry being the dominant component of the site.

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 24, Study no: 6

T y p e	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Agropyron dasystachyum</i>	b15	a-	b16	c49	.15	-	.22	1.46
G	<i>Agropyron spicatum</i>	b117	a7	a41	a14	3.33	.18	.70	.24
G	<i>Agropyron trachycaulum</i>	a3	a4	c65	b36	.03	.03	1.16	.56
G	<i>Bromus anomalus</i>	a3	a-	b19	ab11	.02	-	.24	.15
G	<i>Carex</i> sp.	b36	a-	a4	a11	.56	-	.03	.06
G	<i>Festuca ovina</i>	b20	a-	a-	b22	.22	-	-	.42
G	<i>Koeleria cristata</i>	30	18	19	16	.24	.07	.31	.21
G	<i>Poa fendleriana</i>	b94	a45	b118	b103	1.69	.62	3.13	2.82
G	<i>Poa pratensis</i>	a4	a12	a10	b35	.06	.18	.15	.46
G	<i>Poa secunda</i>	-	5	2	2	-	.18	.03	.03
G	<i>Sitanion hystrix</i>	b49	a-	b55	b63	.95	-	1.09	.91
G	<i>Stipa columbiana</i>	15	28	10	11	.78	.71	.33	.24
G	<i>Stipa comata</i>	a100	a103	b188	b173	2.86	2.83	8.03	7.18
G	<i>Stipa lettermani</i>	ab208	b286	ab214	a201	9.94	13.35	6.26	7.71
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		694	508	761	747	20.89	18.16	21.71	22.48
Total for Grasses		694	508	761	747	20.89	18.16	21.71	22.48
F	<i>Achillea millefolium</i>	3	-	5	4	.03	.00	.18	.03
F	<i>Agoseris glauca</i>	b40	a-	c72	a2	.09	-	.36	.01
F	<i>Androsace septentrionalis</i> (a)	-	-	9	1	-	-	.06	.00
F	<i>Arabis pulchra</i>	1	1	1	-	.00	.00	.01	-
F	<i>Aster</i> sp.	-	1	-	-	-	.00	-	-
F	<i>Astragalus convallarius</i>	b24	a1	b37	b38	.21	.03	1.00	.56
F	<i>Astragalus</i> sp.	1	-	5	-	.00	-	.03	-
F	<i>Calochortus nuttallii</i>	a4	a-	b14	b13	.01	-	.03	.05
F	<i>Chenopodium album</i> (a)	15	17	39	21	.04	.09	.10	.36
F	<i>Crepis acuminata</i>	a5	a-	a2	b17	.06	-	.00	.30
F	<i>Dracocephalum parviflorum</i>	a-	a-	a5	b27	-	-	.03	.33
F	<i>Eriogonum eatonii</i>	7	6	23	5	.03	.01	.14	.03
F	<i>Eriogonum racemosum</i>	ab14	a4	ab18	b22	.11	.01	.16	.29
F	<i>Lappula occidentalis</i> (a)	-	-	1	4	-	-	.03	.15

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
F	Lupinus argenteus	ab110	a80	b132	a113	8.69	7.74	6.82	11.90
F	Lychnis drummondii	a-	a-	b26	a-	-	-	.11	-
F	Lygodesmia spinosa	4	-	-	-	.01	-	-	-
F	Penstemon rydbergii	b7	ab8	a-	ab9	.06	.02	.00	.09
F	Phlox longifolia	-	-	3	2	-	-	.00	.00
F	Phlox pulvinata	76	52	73	46	4.35	.48	2.39	1.27
F	Polygonum douglasii (a)	-	-	-	4	-	-	-	.01
F	Potentilla diversifolia	b12	a-	a2	a1	.06	-	.03	.03
F	Potentilla hippiana	6	4	-	-	.06	.06	-	-
F	Senecio multilobatus	b16	a-	a-	a-	.06	-	-	-
F	Stellaria jamesiana	-	-	3	-	-	-	.03	-
F	Taraxacum officinale	149	123	158	105	2.26	1.68	2.24	1.59
F	Thermopsis montana	2	-	-	-	.03	-	-	-
F	Tragopogon dubius (a)	ab10	a1	b33	b18	.07	.03	.28	.36
Total for Annual Forbs		25	18	82	48	0.11	0.12	0.48	0.90
Total for Perennial Forbs		481	280	579	404	16.16	10.06	13.61	16.52
Total for Forbs		506	298	661	452	16.27	10.18	14.10	17.42

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

#### BROWSE TRENDS--

Management unit 24, Study no: 6

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Amelanchier alnifolia	-	-	-	.15	-	-	-
B	Artemisia tridentata vaseyana	3.08	6.41	9.05	10.11	10.13	17.70	14.48
B	Chrysothamnus viscidiflorus viscidiflorus	-	-	-	.03		.25	.25
B	Mahonia repens	.34	.34	.52	.18	.08	.25	.20
B	Ribes cereum inebrians	.15	.03	.66	1.04	.38	1.35	2.13
B	Rosa woodsii	.03	.03	.38	.15	.01	.08	.13
B	Symphoricarpos oreophilus	5.71	5.16	9.30	12.75	5.48	14.46	12.88
Total for Browse		9.31	11.98	19.91	24.41	16.08	34.09	30.07

#### BASIC COVER--

Management unit 24, Study no: 6

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	52.29	42.06	63.02	63.88
Rock	7.29	23.31	17.02	13.21
Pavement	10.85	9.54	3.84	4.54
Litter	33.23	15.77	23.39	26.74
Cryptogams	.39	0	0	.03
Bare Ground	5.76	14.65	4.23	7.63

PELLET GROUP DATA--

Management unit 24, Study no: 6

Type	Quadrat Frequency				Days use per acre (ha)			
	'97	'03	'08	'13	'97	'03	'08	'13
Sheep	-	24	1	-	-	84 (206)	17 (43)	-
Rabbit	4	-	18	-	-	-	-	-
Elk	15	8	15	4	61 (151)	3 (7)	43 (106)	13 (33)
Deer	18	2	14	1	53 (131)	16 (40)	36 (89)	9 (23)
Cattle	2	4	5	5	10 (25)	13 (32)	17 (43)	10 (25)

BROWSE CHARACTERISTICS--

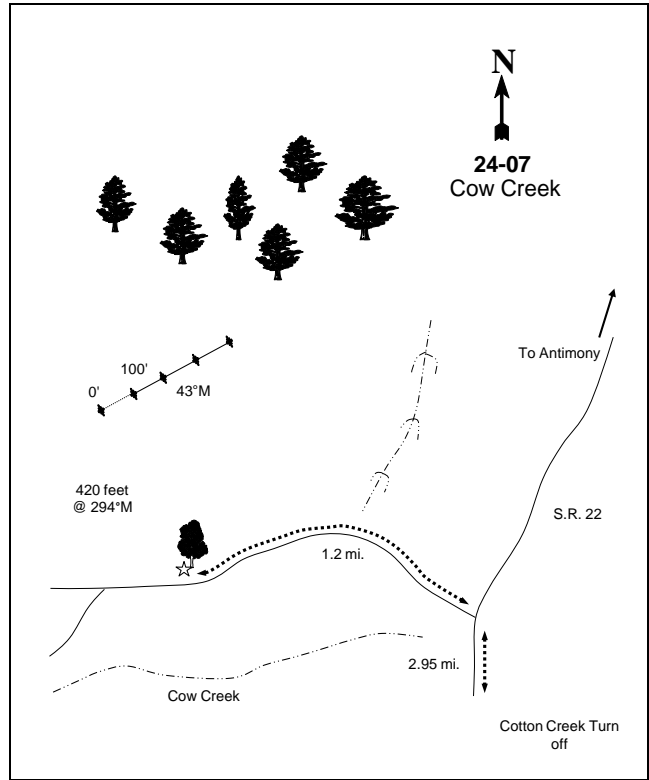
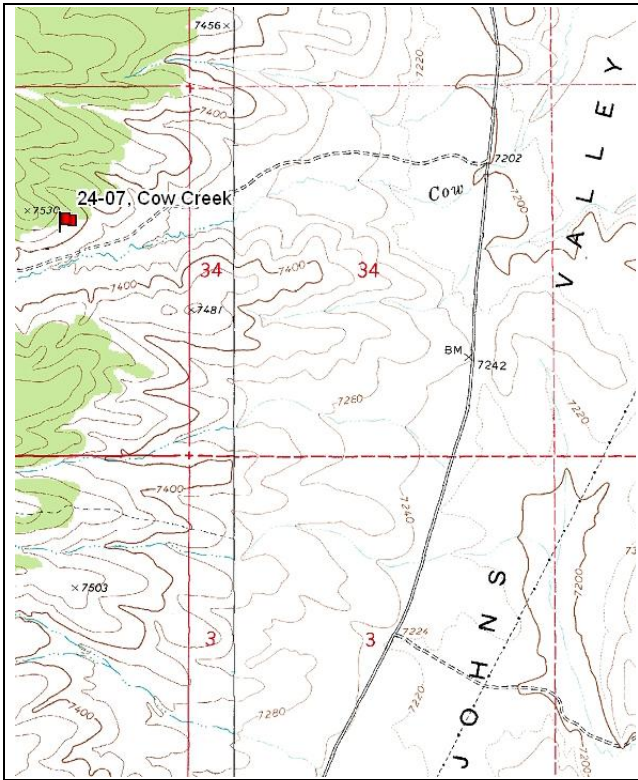
Management unit 24, Study no: 6

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Amelanchier alnifolia</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	100	-/-
<i>Artemisia tridentata vaseyana</i>									
97	1620	62	38	0	760	6	0	0	22/38
03	1760	17	80	3	60	3	0	1	27/37
08	9180	47	50	2	2780	7	.87	.65	20/28
13	3440	20	75	5	-	6	0	1	19/30
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
97	20	0	100	-	-	0	0	0	13/14
03	0	0	0	-	-	0	0	0	16/35
08	40	0	100	-	-	0	50	0	15/29
13	40	0	100	-	-	0	0	0	17/33
<i>Mahonia repens</i>									
97	1940	5	95	0	-	0	0	0	4/6
03	1840	0	100	0	-	0	0	0	2/4
08	2440	11	89	0	-	0	0	0	3/4
13	1780	1	91	8	-	0	0	0	2/4
<i>Pseudotsuga menziesii</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Ribes cereum inebrians</i>									
97	40	0	100	0	-	0	0	0	42/55
03	40	0	100	0	-	50	0	0	55/69
08	40	0	0	100	-	0	0	50	48/63
13	60	0	100	0	-	0	0	0	47/62

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Rosa woodsii</i>										
97	<b>220</b>	45	55	0	-	0	0	0	8/9	
03	<b>160</b>	25	63	13	-	75	0	13	11/9	
08	<b>280</b>	7	93	0	-	0	0	0	10/14	
13	<b>240</b>	25	75	0	-	0	0	0	8/12	
<i>Symphoricarpos oreophilus</i>										
97	<b>1260</b>	10	79	11	40	14	5	3	17/36	
03	<b>1740</b>	8	89	3	-	38	43	1	19/37	
08	<b>1360</b>	1	87	12	40	4	6	1	19/41	
13	<b>1460</b>	7	93	0	40	8	1	0	23/51	



COW CREEK - TREND STUDY NO. 27-7



**Location Information**

USGS 7.5 min Map Info      Cow Creek; Township 32S, Range 2W, Section 33  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 411352 East 4204129 North

**Transect Information**

Browse Tag # (0' Stake)      9002  
 Transect Bearing              43° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Belt 4 & 5: 1ft

**Directions to Site**

From the Cottonwood Creek turnoff of SR 22 south of Antimony, proceed north on the highway 2.95 miles to a gate by Cow Creek. Turn west and drive through the seeded pasture up Cow Creek for 1.2 miles to a lone, mature juniper tree near the road. If you go too far (0.2 more miles) you will come to a fork by a fence. Stop by the lone Juniper and walk up the hill about 140 yards bearing 294 degrees magnetic to the start of the baseline and a short fencepost with browse tag #9002. The transect runs east-northeast along the top edge of the seeding.

**Site Information**

Land Ownership SITLA  
 Allotment Not Available  
 Elevation 7,450ft (2,271m)  
 Aspect South  
 Slope 12-20%  
 Sample Dates 08/08/1987, 08/23/1991, 08/11/1997, 07/22/2003, 08/12/2008, 08/01/2013

**DISTURBANCE HISTORY--**

Management unit 24, Study no: 7

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Disc	-	-	Prior to 1987	-
Seeding	-	-	Prior to 1987	-
Lop and Scatter	Cow and Cottonwood Creek Lop and Scatter	<a href="#">1794</a>	Nov. 2011	2,100

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter: Pronghorn, Crucial Winter; Sage-Grouse, Habitat Winter, Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 24, Study no: 7

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1987-2013	Wyoming Big Sagebrush/Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Pronghorn may be present in the area year-round. Due to the difficulties in distinguishing between pronghorn and deer pellet groups, pronghorn pellet groups have been included in deer pellet group counts. Deer presence on the site has been light to moderate most sampled years, while elk presence has been moderate to heavy. Cattle sign has been infrequent to absent throughout the duration of the study. Sheep sign was noted in 1997 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Borollic Calciorthids  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

**SOIL ANALYSIS DATA--**

Management unit 24, Study no: 7

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Loam	65.0	20.1	14.9	7.4	0.5	2.7	19.1	54.4	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

The main browse species found on the site in 1987 was Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). The perennial grass species crested wheatgrass (*Agropyron cristatum*), bottle-brush

squirreltail (*Sitanion hystrix*), and blue grama (*Bouteloua gracilis*) were also found frequently across the site. This area has experienced some minor encroachment of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), but does not appear to have impacted the site deleteriously. Although the aforementioned species have experience some variation in frequency, the site continues to maintain stable populations of Wyoming big sagebrush and perennial grass species, which is likely due to the continued maintenance of the landscape (Table - Browse Trends, Table - Herbaceous Trends). With the close proximity to mature stands of pinyon and juniper trees, this site has the potential for encroachment, though the site was lop and scattered in 2011 (Table - Disturbance History).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 24, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	8.2	4.8	4.0	23.0	0.0	1.4	0.0	<b>41.4</b>	Fair
2003	8.9	-2.7	0.5	24.8	0.0	0.1	0.0	<b>31.6</b>	Fair
2008	4.0	0.0	0.0	24.9	0.0	1.1	0.0	<b>30.0</b>	Fair
2013	6.7	12.0	15.0	30.0	0.0	0.6	0.0	<b>64.3</b>	Good-Excellent

### HERBACEOUS TRENDS--

Management unit 24, Study no: 7

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Agropyron cristatum	c220	b166	a93	ab176	6.09	4.77	1.45	6.41
G	Agropyron intermedium	10	-	-	-	.04	-	-	-
G	Bouteloua gracilis	a171	ab169	b214	a180	4.39	6.26	8.40	5.64
G	Bromus inermis	-	-	-	1	-	-	-	.03
G	Bromus tectorum (a)	-	-	1	-	-	-	.00	-
G	Oryzopsis hymenoides	ab7	a3	b26	ab12	.07	.04	.46	.42
G	Poa fendleriana	-	18	2	4	-	.15	.00	.01
G	Poa secunda	2	-	5	3	.00	-	.01	.00
G	Sitanion hystrix	58	70	63	54	.68	.50	.84	1.09
G	Stipa comata	a21	a34	b88	b94	.19	.66	1.25	4.65
Total for Annual Grasses		0	0	1	0	0	0	0.00	0
Total for Perennial Grasses		489	460	491	524	11.48	12.39	12.44	18.26
Total for Grasses		489	460	492	524	11.48	12.39	12.44	18.26
F	Antennaria sp.	-	4	2	-	-	.00	.00	-
F	Astragalus lentiginosus	a-	a-	b12	a-	-	-	.31	-
F	Astragalus newberryi	b27	a-	b14	a-	.06	-	.10	-
F	Chenopodium sp. (a)	4	-	3	6	.00	-	.00	.01
F	Cryptantha sp.	b42	a1	a10	a12	.59	.00	.07	.08
F	Descurainia pinnata (a)	a-	b23	b30	a-	-	.08	.14	-
F	Erigeron pumilus	-	-	1	-	-	-	.00	-
F	Euphorbia sp.	-	-	-	2	-	-	-	.00
F	Gayophytum ramosissimum(a)	b25	a-	a3	a-	.26	-	.00	-

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
F	Gilia sp. (a)	a <sup>-</sup>	b <sup>14</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.05	-	-
F	Lappula occidentalis (a)	a <sup>-</sup>	a <sup>5</sup>	b <sup>39</sup>	a <sup>-</sup>	-	.04	.19	-
F	Sphaeralcea coccinea	ab <sup>7</sup>	ab <sup>7</sup>	a <sup>4</sup>	b <sup>11</sup>	.01	.04	.03	.22
F	Streptanthus cordatus	2	-	4	-	.03	-	.03	-
Total for Annual Forbs		29	42	75	6	0.26	0.18	0.34	0.01
Total for Perennial Forbs		78	12	47	25	0.70	0.05	0.57	0.30
Total for Forbs		107	54	122	31	0.97	0.23	0.91	0.31

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

### BROWSE TRENDS--

Management unit 24, Study no: 7

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	6.56	7.15	3.21	5.32	6.25	10.88	8.16
B	Gutierrezia sarothrae	.04	.58	.11	.19	.41	.01	.18
B	Opuntia sp.	.03	-	-	.00	.20	-	-
B	Pediocactus simpsonii	-	-	.00	.00	-	-	-
B	Pinus edulis	6.08	5.26	4.08	.60	9.28	10.51	6.23
Total for Browse		12.72	13.00	7.41	6.13	16.14	21.4	14.57

### POINT-QUARTER TREE DATA--

Management unit 24, Study no: 7

Species	Trees per Acre				Average diameter (in)			
	'97	'03	'08	'13	'97	'03	'08	'13
Juniperus osteosperma	14	44	47	27	-	3.3	3.7	0.9
Pinus edulis	42	31	33	25	-	6.4	5.4	4.5

### BASIC COVER--

Management unit 24, Study no: 7

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	26.76	24.88	25.21	28.05
Rock	3.86	5.70	6.07	6.98
Pavement	27.73	36.37	36.09	30.14
Litter	33.72	36.44	32.87	32.47
Bare Ground	9.88	11.88	10.47	6.29

PELLET GROUP DATA--

Management unit 24, Study no: 7

Type	Quadrat Frequency				Days use per acre (ha)			
	'97	'03	'08	'13	'97	'03	'08	'13
Rabbit	13	39	97	31	-	-	-	-
Elk	31	32	4	14	63 (156)	35 (86)	1 (2)	25 (63)
Deer/ Pronghorn	17	6	10	11	7 (17)	24 (60)	8 (20)	15 (38)
Sheep	-	-	-	-	6 (15)	-	-	-
Cattle	4	1	2	2	27 (67)	1 (2)	1 (2)	-

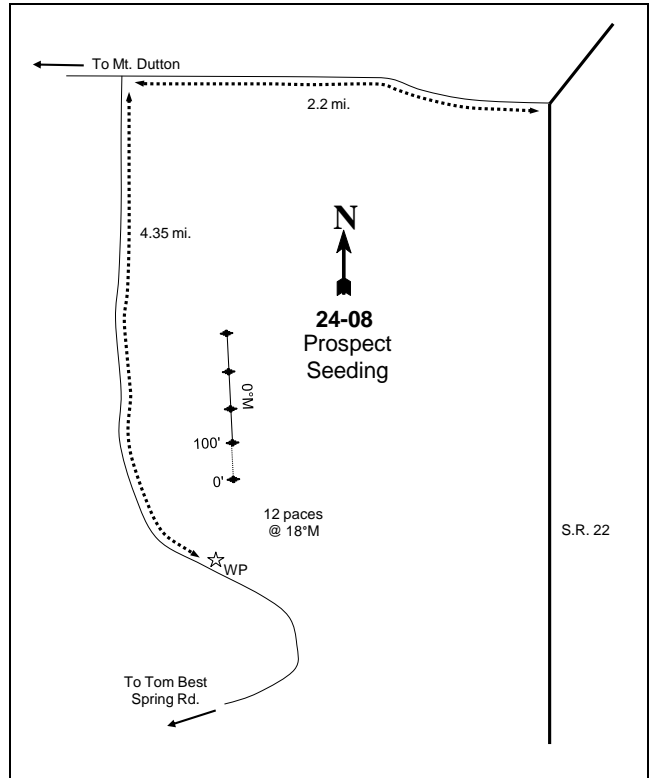
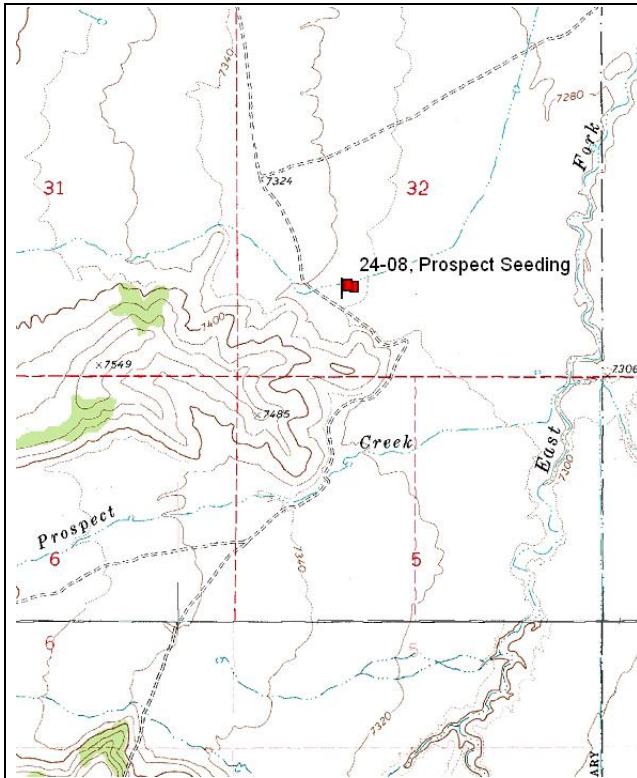
BROWSE CHARACTERISTICS--

Management unit 24, Study no: 7

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>									
97	<b>2280</b>	8	58	34	40	28	3	19	21/27
03	<b>1920</b>	1	40	59	-	35	5	32	23/30
08	<b>1420</b>	3	28	69	80	37	11	42	21/31
13	<b>1800</b>	32	58	10	340	30	21	16	24/36
<i>Echinocereus sp.</i>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	9/17
<i>Gutierrezia sarothrae</i>									
97	<b>220</b>	9	91	-	-	0	0	0	8/8
03	<b>1800</b>	43	57	-	-	0	0	0	7/8
08	<b>940</b>	21	79	-	140	0	2	0	6/5
13	<b>700</b>	14	86	-	-	0	0	0	6/9
<i>Juniperus osteosperma</i>									
97	<b>20</b>	100	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>20</b>	100	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
97	<b>40</b>	0	100	-	-	0	0	0	5/10
03	<b>80</b>	0	100	-	-	0	0	0	4/15
08	<b>0</b>	0	0	-	-	0	0	0	5/12
13	<b>40</b>	50	50	-	-	0	0	0	4/14

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Pediocactus simpsonii</i>										
97	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	3/12	
08	<b>20</b>	0	100	-	-	0	0	0	-/-	
13	<b>80</b>	50	50	-	-	0	0	0	1/2	
<i>Pinus edulis</i>										
97	<b>60</b>	33	67	-	-	0	0	0	-/-	
03	<b>80</b>	75	25	-	20	0	0	0	-/-	
08	<b>40</b>	50	50	-	20	0	0	0	-/-	
13	<b>80</b>	75	25	-	-	0	25	25	-/-	
<i>Sclerocactus sp.</i>										
97	<b>0</b>	0	0	-	-	0	0	0	3/11	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	20	0	0	0	3/11	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

PROSPECT SEEDING - TREND STUDY NO. 24-8



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Cow Creek; Township 33S, Range 2W, Section 32  
NAD 83, UTM Zone 12, 409060 East 4193851 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
0° magnetic  
400ft  
Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Standard

**Directions to Site**

From SR 22, turn towards Cottonwood Creek (west onto the Mt. Dutton loop road) and travel about 2.2 miles to a major fork. Turn south towards Tom Best spring (Cottonwood AS is to the right, north) and go 0.3 miles to the U.S. Forest Service boundary fence. Cross the cattleguard and continue on the main road for 4.35 miles. The study area here is marked by a 4 foot green fencepost, and is north of the road in a sage-grass flat. The transect is marked by 1-foot tall fence posts.

**Site Information**

Land Ownership USFS  
 Allotment Widtsoe C&H  
 Elevation 7,310ft (2,228m)  
 Aspect Flat  
 Slope 0-3%  
 Sample Dates 08/11/1987, 08/10/1991, 08/14/1997, 07/22/2003, 08/11/2008, 07/18/2013

**DISTURBANCE HISTORY--**

Management unit 24, Study no: 8

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Disc	-	-	1968	-
Seeding	-	-	1968	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Pronghorn, Crucial Year-Long, Fawning Habitat; Sage-Grouse, Habitat Winter

**VEGETATION HISTORY--**

Management unit 24, Study no: 8

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1987-1997	Wyoming Big Sagebrush/Perennial Grass	No Encroachment
2003-2013	Perennial Grass	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The nearest water sources for wildlife are Prospect Creek at one-quarter mile and the East Fork of the Sevier River at three-quarters of a mile. Pronghorn can be found year-long on the site. Due to the difficulty of distinguishing pronghorn pellets from deer pellets, pronghorn pellet groups have been added to the deer pellet group count. Deer and pronghorn presence has been light since 1997. Elk pellet groups were found in high abundance in 1997, but have since been found in low abundance. The presence of rabbit has varied dramatically since 1997 (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 11 inches  
 NRCS Taxonomical soil Classification Fine-silty, mixed Cumulic Haploborolls  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

**SOIL ANALYSIS DATA--**

Management unit 24, Study no: 8

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Loam	54.4	30.1	15.6	7.2	0.6	1.76	12.7	921.6	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Since the outset of the study in 1987, the major browse component has been Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*) with an herbaceous understory composed mainly of the introduced



perennial grass crested wheatgrass (*Agropyron cristatum*). However, in 2003, the community was likely heavily impacted by drought. The sagebrush population had a significant increase in dead plants and crested wheatgrass decreased significantly in cover and frequency. With the decrease in sagebrush, the site transitioned to a perennial grass community in 2003. Wyoming big sagebrush has since increased in cover, but has remained a minor component on the site, while crested wheatgrass has remained stable (Table - Browse Characteristics, Table - Browse Trends, Table - Herbaceous Trends).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 24, study no: 8

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	3.5	0.0	0.0	24.4	0.0	0.0	0.0	<b>27.9</b>	Fair
2003	1.1	0.0	0.0	7.0	0.0	0.0	0.0	<b>8.1</b>	Very Poor-Poor
2008	2.1	0.0	0.0	30.0	0.0	0.0	0.0	<b>32.1</b>	Fair
2013	1.9	0.0	0.0	23.3	0.0	0.0	0.0	<b>25.2</b>	Poor-Fair

HERBACEOUS TRENDS--  
 Management unit 24, Study no: 8

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Agropyron cristatum</i>	c295	a163	b246	c300	12.21	2.74	12.50	11.47
G	<i>Bouteloua gracilis</i>	a-	a-	b10	b5	-	-	.04	.01
G	<i>Elymus junceus</i>	a-	b20	c48	a3	-	.74	3.78	.16
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		295	183	304	308	12.21	3.48	16.33	11.65
Total for Grasses		295	183	304	308	12.21	3.48	16.33	11.65
F	<i>Chenopodium album</i> (a)	b37	a3	ab25	a9	.33	.18	.05	.02
F	<i>Cryptantha</i> sp.	1	-	-	-	.00	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	2	8	-	-	.01	.02	-
F	<i>Euphorbia</i> sp.	-	-	4	-	-	-	.00	-
F	<i>Salsola iberica</i> (a)	a-	a-	b22	a-	-	-	.29	-
F	<i>Senecio multilobatus</i>	-	1	-	-	-	.00	-	-
Total for Annual Forbs		37	5	55	9	0.33	0.19	0.37	0.02
Total for Perennial Forbs		1	1	4	0	0.00	0.00	0.00	0
Total for Forbs		38	6	59	9	0.34	0.20	0.37	0.02

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

BROWSE TRENDS--

Management unit 24, Study no: 8

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	2.80	.89	1.68	1.53	.10	1.76	2.55
B	Chrysothamnus nauseosus	-	-	.30	.66	-	.48	.85
Total for Browse		2.80	0.89	1.98	2.19	0.1	2.24	3.4

BASIC COVER--

Management unit 24, Study no: 8

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	15.66	4.46	19.93	14.74
Rock	.11	.08	.11	.62
Pavement	11.48	15.22	13.47	10.42
Litter	13.57	22.26	24.50	12.95
Cryptogams	.46	.01	0	.01
Bare Ground	46.99	63.10	51.18	61.11

PELLET GROUP DATA--

Management unit 24, Study no: 8

Type	Quadrat Frequency				Days use per acre (ha)			
	'97	'03	'08	'13	'97	'03	'08	'13
Sheep	1	-	-	-	8 (20)	-	-	-
Rabbit	37	52	98	18	-	-	-	-
Grouse	-	-	-	1	-	-	-	-
Elk	21	9	-	-	48 (119)	16 (33)	3 (7)	-
Deer/ Pronghorn	12	3	1	7	13 (31)	5 (12)	1 (3)	6 (15)
Cattle	8	15	7	8	64 (158)	27 (66)	41 (102)	23 (57)

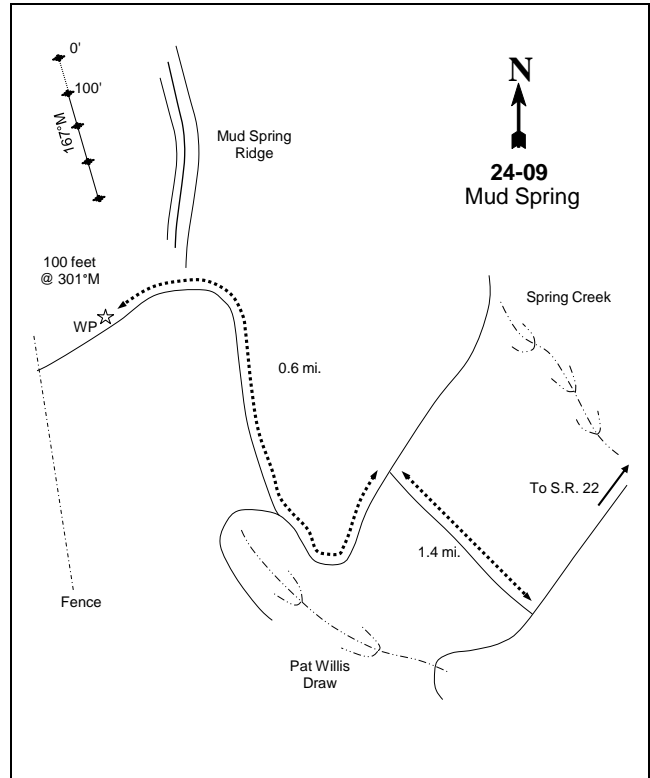
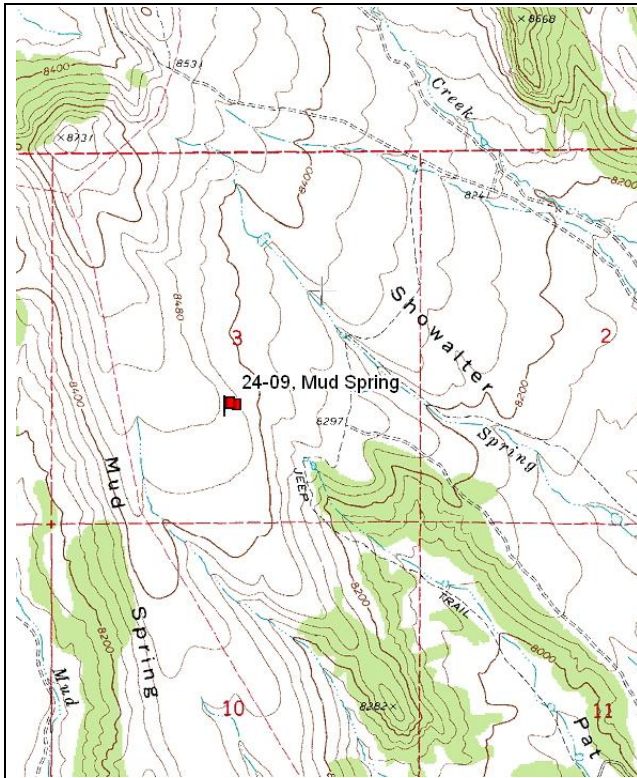
BROWSE CHARACTERISTICS--

Management unit 24, Study no: 8

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Artemisia tridentata wyomingensis									
97	<b>2280</b>	8	57	35	40	40	4	22	13/17
03	<b>480</b>	4	4	92	-	50	0	88	17/24
08	<b>1200</b>	17	55	28	120	7	0	18	12/16
13	<b>860</b>	2	98	0	140	44	33	2	14/20

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Chrysothamnus nauseosus</i>										
97	<b>20</b>	0	100	0	-	100	0	0	-/-	
03	<b>40</b>	0	50	50	-	50	50	0	10/10	
08	<b>80</b>	0	100	0	-	50	0	0	15/16	
13	<b>60</b>	0	100	0	-	33	0	0	20/29	

MUD SPRING - TREND STUDY NO. 24-9



**Location Information**

USGS 7.5 min Map Info      Flake Mountain West; Township 35S, Range 4W, Section 3  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 393113 East 4182844 North

**Transect Information**

Browse Tag # (0' Stake)      Not Available  
 Transect Bearing              167° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Belt 2 & 3: 1ft

**Directions to Site**

From SR 22, about 1.5 miles south of Widtsøe Junction, turn west onto the road leading to Tom Best Spring and Highway 12. Proceed 4.2 miles to the U.S. Forest Service boundary. Continue on the main road for 5.3 miles to an intersection at Showalter Creek. Continue on the main road 1 mile to a faint road on the right. Turn and go up towards Mud Spring Ridge 1.4 miles to a T-intersection. Turn left and go 0.6 miles up a faint, rough road to the top of the ridge and a witness post identifying the study area. The 400 foot stake is 100 feet northwest of the witness post. The start of the transect is actually 400 feet north, and runs back south towards the road. Study markers are 1-foot tall fence posts.

**Site Information**

Land Ownership USFS  
 Allotment East Pines C&H  
 Elevation 8,470ft (2,582m)  
 Aspect Southeast  
 Slope 3-5%  
 Sample Dates 08/08/1987, 08/10/1991, 08/07/1997, 07/22/2003, 07/07/2008, 07/18/2013

**DISTURBANCE HISTORY--**

Management unit 24, Study no: 9

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Harrow (1-Way Dixie)	Sevier Plateau Dixie Harrow	<a href="#">461</a>	Fall 2006	500
Seeding (Broadcast Before)	Sevier Plateau Dixie Harrow	<a href="#">461</a>	Fall 2006	500

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 24, Study no: 9

Project Name: Sevier Plateau Dixie Harrow			
WRI Database #: <a href="#">461</a>			
Application: Broadcast		Acres: 500	
Seed type		lbs in mix	lbs/acre
G	Bluebunch WG 'Goldar'	875	1.75
G	Indian Ricegrass 'Rimrock'	525	1.05
G	Slender Wheatgrass 'San Luis'	850	1.70
F	Gooseberryleaf Globemallow	40	0.08
F	Showy Goldeneye	30	0.06
F	Small Burnet 'Delar'	1075	2.15
F	Western Yarrow	323	0.65
B	Winterfat	400	0.80
Total Pounds:		4118	8.24
PLS Pounds:		3515	7.03

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Year-Long, Calving; Pronghorn, Crucial Year-Long, Fawning; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 24, Study no: 9

<i>Year</i>	<i>Vegetation Type</i>	<i>Woodland Succession</i>
1987-2013	Black Sagebrush	No encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Pronghorn may be present in the area year-round. Due to the difficulties in distinguishing between pronghorn and deer pellet groups, pronghorn pellet groups have been included in the deer pellet group counts. Elk and deer/pronghorn pellet groups have been sampled on low to moderate amounts since 1997. Cattle pats have been sampled in low abundance over the same duration. Sage-grouse have had a presence on the site, with pellet groups being sampled in 2008 and 2013 (Table - Pellet Group Data). Sage-grouse feathers were also observed on the site in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 18 inches  
 NRCS Taxonomical soil Classification Clayey-skeletal, montmorillonitic Typic Argiborolls  
 NRCS Ecological Site [Upland Shallow Hardpan \(Black Sagebrush\)](#)  
 NRCS Ecological Site # R047XB316UT

**SOIL ANALYSIS DATA--**

Management unit 24, Study no: 9

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	48.7	25.4	25.8	6.1	0.5	2.7	11.9	275.2	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has remained in a stable state of black sagebrush (*Artemisia nova*) with an herbaceous understory comprised mainly of mutton bluegrass (*Poa fendleriana*) and Letterman needle-grass (*Stipa lettermani*). Perennial grass and forb species have been diverse on the site. Introduced annual grass species have not been sampled and annual forb species have been limited on the site (Table - Browse Trends, Table - Herbaceous Trends). Without a disturbance, this site will likely remain in a stable state with sagebrush being the dominant component of the site.

**Trend Summary**

**DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --**

Management unit 24, study no: 9

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	21.5	10.4	7.2	26.9	0.0	10.0	0.0	<b>75.9</b>	Good
2003	30.0	11.4	5.1	27.3	0.0	10.0	0.0	<b>83.8</b>	Excellent
2008	17.4	6.4	5.8	30.0	0.0	10.0	0.0	<b>69.5</b>	Good
2013	24.3	14.6	2.5	29.4	0.0	10.0	0.0	<b>80.8</b>	Good-Excellent

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Agropyron smithii	a6	a8	b36	a19	.18	.04	.40	.37
G	Agropyron trachycaulum	b8	a-	a-	a-	.16	-	-	-
G	Bouteloua gracilis	22	24	28	18	.15	.27	.75	.54
G	Carex sp.	89	64	72	68	2.15	1.22	1.06	1.75
G	Poa fendleriana	a174	c282	bc227	ab204	3.26	7.83	8.60	5.78
G	Poa secunda	c49	a-	bc24	b21	1.27	-	.17	.42
G	Sitanion hystrix	a34	a34	a39	b65	.21	.19	.61	1.06
G	Stipa columbiana	a-	a5	a7	ab11	-	.03	.09	.19
G	Stipa comata	a44	a30	b76	a40	.86	.32	3.09	.47
G	Stipa lettermani	c242	bc199	a121	b179	5.17	3.73	2.20	4.08

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
	Total for Annual Grasses	0	0	0	0	0	0	0	0
	Total for Perennial Grasses	668	646	630	625	13.45	13.65	16.98	14.70
	Total for Grasses	668	646	630	625	13.45	13.65	16.98	14.70
F	<i>Achillea millefolium</i>	a-	a-	ab10	b16	-	-	.16	.46
F	<i>Androsace septentrionalis</i> (a)	-	-	5	1	-	-	.01	.00
F	<i>Antennaria</i> sp.	47	49	43	42	1.27	.74	.78	1.53
F	<i>Arabis</i> sp.	a1	a-	b12	a-	.00	-	.03	-
F	<i>Aster</i> sp.	3	1	-	3	.00	.00	-	.15
F	<i>Astragalus humistratus</i>	c103	a3	b57	b68	.73	.03	.48	1.83
F	<i>Astragalus newberryi</i>	-	-	-	4	-	-	-	.01
F	<i>Balsamorhiza hookeri</i>	-	-	-	1	-	-	-	.00
F	<i>Castilleja linariaefolia</i>	3	9	1	7	.02	.01	.03	.12
F	<i>Chaenactis douglasii</i>	5	-	-	1	.00	-	-	.00
F	<i>Cirsium</i> sp.	26	19	28	44	.37	.35	1.32	.96
F	<i>Cordylanthus</i> sp. (a)	a-	a-	a-	b21	-	-	-	.20
F	<i>Crepis acuminata</i>	a-	ab9	b16	a1	-	.07	.03	.01
F	<i>Cryptantha</i> sp.	1	-	7	2	.03	-	.02	.01
F	<i>Erigeron eatonii</i>	33	32	32	22	.20	.20	.20	.11
F	<i>Erigeron pumilus</i>	b16	b31	a-	b13	.06	.30	-	.05
F	<i>Eriogonum racemosum</i>	198	180	214	180	1.45	1.68	3.08	3.06
F	<i>Eriogonum umbellatum</i>	58	49	47	75	.56	.70	.53	.91
F	<i>Galium boreale</i>	5	-	-	-	.01	-	-	-
F	<i>Gayophytum ramosissimum</i> (a)	-	7	6	2	-	.01	.02	.01
F	<i>Hymenopappus filifolius</i>	-	2	-	2	-	.03	-	.18
F	<i>Hymenoxys acaulis</i>	6	-	7	2	.04	-	.01	.00
F	<i>Linum lewisii</i>	1	-	-	6	.03	-	-	.01
F	<i>Lotus utahensis</i>	a1	a22	b80	b65	.00	.12	1.76	1.05
F	<i>Lupinus pusillus</i> (a)	a-	a-	b15	b10	-	-	.06	.05
F	<i>Lupinus sericeus</i>	b54	a29	a18	a16	1.33	.29	.93	.42
F	<i>Lygodesmia spinosa</i>	16	5	8	4	.10	.19	.04	.04
F	<i>Microsteris gracilis</i> (a)	2	-	-	-	.00	-	-	-
F	<i>Orthocarpus</i> sp. (a)	a2	b19	ab11	a-	.01	.10	.06	-
F	<i>Penstemon comarrhenus</i>	5	-	9	13	.01	-	.19	.03
F	<i>Phlox longifolia</i>	a20	a11	b55	a23	.04	.02	.13	.10
F	<i>Polygonum douglasii</i> (a)	b24	a-	a2	a3	.05	-	.01	.01
F	<i>Potentilla diversifolia</i>	10	9	4	8	.22	.07	.33	.22
F	<i>Senecio multilobatus</i>	a21	b53	ab42	a23	.18	.36	.22	.10
F	<i>Sphaeralcea coccinea</i>	12	4	7	5	.04	.04	.03	.03
F	<i>Taraxacum officinale</i>	3	-	-	-	.00	-	-	-
	Total for Annual Forbs	28	26	39	37	0.06	0.12	0.16	0.29
	Total for Perennial Forbs	648	517	697	646	6.76	5.25	10.36	11.44
	Total for Forbs	676	543	736	683	6.82	5.37	10.52	11.73

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

BROWSE TRENDS--

Management unit 24, Study no: 9

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia nova	12.12	21.05	13.00	13.84	18.03	14.15	20.38
B	Artemisia tridentata vaseyana	1.64	1.72	.44	2.64	1.45	.88	2.01
B	Chrysothamnus depressus	3.40	2.66	-	2.53	1.10	-	3.91
B	Chrysothamnus nauseosus hololeucus	.01	.95	-	-	1.04	-	-
B	Chrysothamnus parryi	.03	.40	.62	1.35	.05	.31	1.91
B	Chrysothamnus viscidiflorus viscidiflorus	1.90	1.97	3.49	.12	.96	3.86	.26
B	Leptodactylon pungens	.02	.43	.60	.82	.11	.16	.98
B	Purshia tridentata	-	.03	.38	.38	.10	.20	.58
B	Symphoricarpos oreophilus	.00	-	.03	.03	.26	-	.15
B	Tetradymia canescens	-	.15	-	.03	-	.03	.03
Total for Browse		19.15	29.38	18.57	21.77	23.1	19.59	30.21

BASIC COVER--

Management unit 24, Study no: 9

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	29.07	46.79	43.67	48.59
Rock	8.10	10.64	10.45	13.96
Pavement	6.79	5.70	5.26	1.20
Litter	30.77	28.35	27.96	27.04
Cryptogams	.13	.13	0	.00
Bare Ground	22.82	25.12	24.62	24.06

PELLET GROUP DATA--

Management unit 24, Study no: 9

Type	Quadrat Frequency			
	'97	'03	'08	'13
Rabbit	8	20	92	3
Grouse	-	2	7	1
Elk	34	14	2	3
Deer/Pronghorn	22	10	7	2
Cattle	8	5	3	5

Days use per acre (ha)		
'03	'08	'13
-	-	-
-	4 (35) pellets/acre	3 (26) pellets/acre
32 (79)	8 (20)	15 (38)
32 (79)	7 (17)	4 (10)
16 (39)	1 (2)	16 (39)



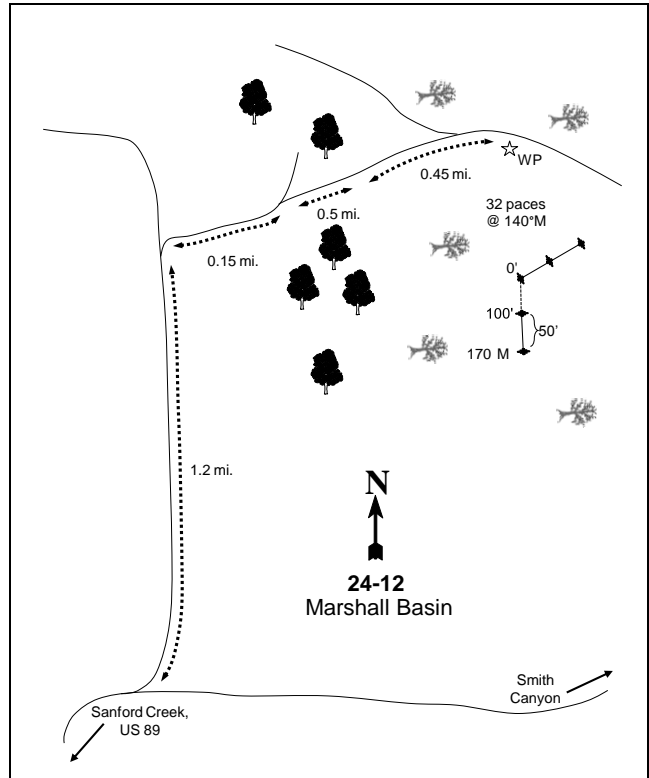
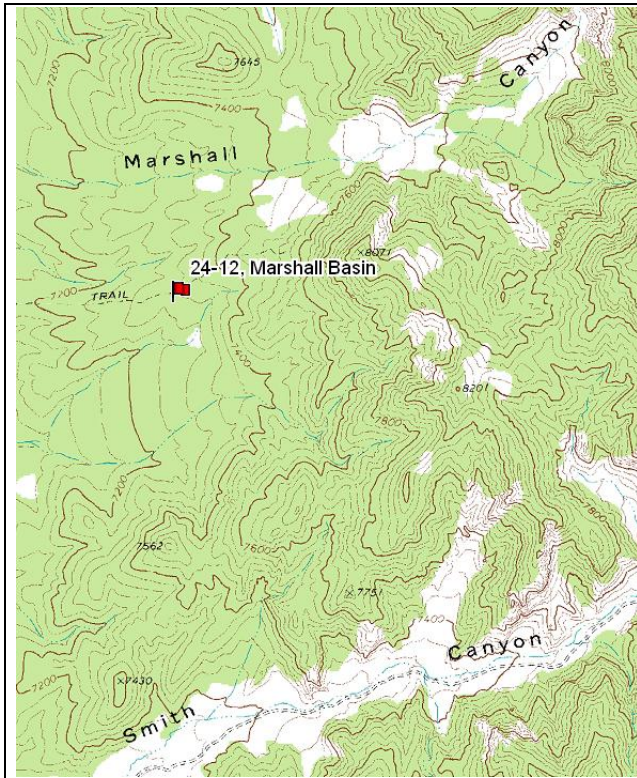
BROWSE CHARACTERISTICS--

Management unit 24, Study no: 9

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 nova</i>									
97	<b>9920</b>	15	69	17	480	4	0	11	12/19
03	<b>18820</b>	12	75	13	80	3	0	4	13/18
08	<b>13780</b>	11	59	30	4440	40	.72	19	11/15
13	<b>10220</b>	5	93	2	620	49	7	5	9/16
<i>Artemisia tridentata vaseyana</i>									
97	<b>340</b>	0	65	35	80	18	0	6	24/34
03	<b>460</b>	4	78	17	-	61	0	4	26/36
08	<b>420</b>	10	71	19	80	5	14	19	15/18
13	<b>860</b>	9	91	0	20	49	14	2	12/18
<i>Chrysothamnus depressus</i>									
97	<b>3040</b>	19	81	0	20	0	0	0	5/8
03	<b>3980</b>	0	100	0	-	0	0	0	4/7
08	<b>440</b>	18	59	23	20	9	5	0	4/7
13	<b>9180</b>	2	98	0	120	.43	0	0	5/11
<i>Chrysothamnus nauseosus hololeucus</i>									
97	<b>180</b>	56	44	0	-	0	0	0	7/10
03	<b>1280</b>	0	95	5	-	8	0	2	6/10
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Chrysothamnus parryi</i>									
97	<b>80</b>	25	75	0	-	0	0	0	9/10
03	<b>1480</b>	1	99	0	-	18	26	0	6/8
08	<b>1360</b>	6	91	3	-	10	3	1	6/8
13	<b>2840</b>	1	99	0	-	1	0	0	7/10
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
97	<b>1880</b>	0	99	1	-	2	0	1	14/23
03	<b>2960</b>	3	94	3	-	0	0	1	7/10
08	<b>7700</b>	9	89	2	140	13	4	3	5/9
13	<b>200</b>	40	60	0	-	0	0	0	9/12
<i>Gutierrezia sarothrae</i>									
97	<b>20</b>	0	100	-	-	0	0	0	6/6
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	4/7
<i>Leptodactylon pungens</i>									
97	<b>460</b>	0	96	4	20	0	0	4	6/7
03	<b>880</b>	0	89	11	-	0	0	5	6/7
08	<b>1120</b>	5	88	7	180	7	0	2	4/5
13	<b>740</b>	8	92	0	-	8	0	8	7/9

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>Opuntia</i> sp.									
97	<b>0</b>	0	0	-	-	0	0	0	2/5
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
97	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>100</b>	0	80	20	-	0	100	20	10/22
08	<b>60</b>	33	67	0	20	0	0	0	11/16
13	<b>60</b>	0	100	0	20	33	67	0	21/36
<i>Symphoricarpos oreophilus</i>									
97	<b>20</b>	0	100	-	-	100	0	0	12/30
03	<b>40</b>	0	100	-	-	0	0	0	10/24
08	<b>0</b>	0	0	-	-	0	0	0	13/36
13	<b>40</b>	0	100	-	-	0	0	0	17/26
<i>Tetradymia canescens</i>									
97	<b>20</b>	100	0	0	-	0	0	0	-/-
03	<b>80</b>	0	100	0	-	0	0	0	7/9
08	<b>20</b>	0	0	100	-	0	0	100	9/6
13	<b>20</b>	0	100	0	-	100	0	0	10/12

MARSHALL BASIN - TREND STUDY NO. 24-12



**Location Information**

USGS 7.5 min Map Info Blind Spring Mountain; Township 32S, Range 4.5W, Section 34  
 GPS (0' Stake) NAD 83, UTM Zone 12, 383991 East 4204402 North

**Transect Information**

Browse Tag # (0' Stake) 9003  
 Transect Bearing 170° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

About 8 miles north of Panguitch on Highway 89 (or 1.7 miles south of the SR20 and Highway 89 junction) turn east onto the Sanford Creek Road. Travel 4 miles east on the main road to a fork and bear left towards Smith Canyon. Go 1.5 miles to a fork just below the mouth of Smith Canyon, turn left. Continue 1.2 miles to a fork. Stay left onto jeep-trail and go 0.15 miles to another fork. Stay right and continue 0.5 miles to the edge of a chaining. Continue 0.45 miles east into the chaining to the study area. The witness post is on the right side of road. From the witness post walk 32 paces at 140 degrees magnetic to the 0' stake. The 0' baseline stake is marked by browse tag #9003.

**Site Information**

Land Ownership USFS  
 Allotment Deer Creek S&G  
 Elevation 7,290ft (2,222m)  
 Aspect Southwest  
 Slope 8-13%  
 Sample Dates 08/19/1987, 08/22/1991, 08/11/1997, 07/10/2003, 07/09/2008, 07/15/2013

**DISTURBANCE HISTORY--**

Management unit 24, Study no: 12

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Fall 1984	900
Seeding	-	-	Fall 1984	900
Wildfire	-	-	1996	1

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Year-Long

**VEGETATION HISTORY--**

Management unit 24, Study no: 12

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1997	Perennial Grass	Phase I
2003-2013	Perennial Grass/Rubber Rabbitbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Cover for wildlife is provided by nearby wooded slopes located above the chaining and in draws that transverse the area. Elk and deer/pronghorn pellet groups have been sampled in low to moderate amounts since 1997 (Table – Pellet Group Data). There appears to be two subspecies of rubber rabbitbrush (*Chrysothamnus* sp.) on the site. The site partially burned in 1996 but it only affected belt four.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Coarse-loamy, mixed Typic Haploborolls  
 NRCS Ecological Site [Upland Stony Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R047XB336UT

**SOIL ANALYSIS DATA--**

Management unit 24, Study no: 12

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	57.3	18.6	24.1	N/A	0.5	2.0	24.6	188.8	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1987, the site consisted of a mixed perennial grass community of bottlebrush squirreltail (*Sitanion hystrix*), blue grama (*Bouteloua gracilis*), and crested wheatgrass (*Agropyron cristatum*). Since 1997, the community transitioned from a heterogeneous perennial grass community to a more homogeneous structure composed mainly of crested wheatgrass. Additionally, rubber rabbitbrush has steadily increased in

density, but has maintained consistent low cover. This may indicate that the site may be in mid-transition from a perennial grass community to a rubber rabbitbrush community. Introduced annual grass and forb species have had a limited presence on the site (Table - Herbaceous Trends, Table - Browse Trends). Without further disturbance, rabbitbrush will likely become the dominant component on this site.

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 24, study no: 12

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	0.0	0.0	0.0	23.6	-1.1	0.1	0.0	<b>22.6</b>	Very Poor
2003	0.2	0.0	0.0	16.1	0.0	0.0	0.0	<b>16.3</b>	Very Poor
2008	0.0	0.0	0.0	17.1	0.0	0.5	0.0	<b>17.5</b>	Very Poor
2013	0.0	0.0	0.0	30.0	0.0	0.2	0.0	<b>30.2</b>	Very Poor

### HERBACEOUS TRENDS--

Management unit 24, Study no: 12

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Agropyron cristatum</i>	<sub>b</sub> 252	<sub>a</sub> 182	<sub>ab</sub> 225	<sub>c</sub> 331	11.48	7.84	7.42	17.12
G	<i>Agropyron intermedium</i>	<sub>ab</sub> 8	<sub>a</sub> 3	<sub>b</sub> 12	<sub>c</sub> 4	.07	.03	.17	.03
G	<i>Bouteloua gracilis</i>	<sub>b</sub> 18	<sub>b</sub> 10	<sub>a</sub> 7	<sub>ab</sub> 16	.21	.19	.31	.33
G	<i>Bromus tectorum</i> (a)	<sub>b</sub> 95	<sub>a</sub> 4	<sub>a</sub> 7	<sub>a</sub> 6	1.47	.04	.02	.01
G	<i>Festuca ovina</i>	-	-	6	1	-	-	.03	.00
G	<i>Oryzopsis hymenoides</i>	1	-	10	7	.01	-	.33	.56
G	<i>Poa secunda</i>	-	-	4	-	-	-	.00	-
G	<i>Sitanion hystrix</i>	<sub>ab</sub> 3	<sub>ab</sub> 2	<sub>b</sub> 11	<sub>a</sub> 1	.03	.01	.27	.03
Total for Annual Grasses		95	4	7	6	1.47	0.04	0.02	0.01
Total for Perennial Grasses		282	197	275	360	11.80	8.07	8.55	18.08
Total for Grasses		377	201	282	366	13.28	8.11	8.58	18.09
F	<i>Astragalus</i> sp.	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 7	<sub>a</sub> -	-	-	.07	-
F	<i>Chenopodium fremontii</i> (a)	2	12	9	5	.01	.11	.05	.01
F	<i>Cryptantha fulvocanescens</i>	11	2	7	10	.05	.00	.16	.08
F	<i>Descurainia pinnata</i> (a)	2	-	2	3	.00	-	.01	.00
F	<i>Erigeron pumilus</i>	1	-	-	-	.00	-	-	-
F	<i>Lactuca serriola</i> (a)	-	-	1	-	-	-	.15	-
F	<i>Lappula occidentalis</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>c</sub> 16	<sub>ab</sub> 3	-	-	.20	.01
F	<i>Nicotiana attenuata</i> (a)	<sub>a</sub> -	<sub>b</sub> 55	<sub>a</sub> -	<sub>a</sub> -	-	1.76	.00	-
F	<i>Phlox longifolia</i>	1	-	-	1	.00	-	-	.00
F	<i>Sisymbrium altissimum</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 20	<sub>a</sub> -	-	-	.23	-
Total for Annual Forbs		4	67	48	11	0.01	1.87	0.66	0.02
Total for Perennial Forbs		13	2	14	11	0.06	0.00	0.23	0.08
Total for Forbs		17	69	62	22	0.07	1.88	0.89	0.11

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

BROWSE TRENDS--

Management unit 24, Study no: 12

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia pygmaea	.18	-	-	-	-	-	-
B	Artemisia tridentata vaseyana	-	.15	-	-	.50	-	-
B	Chrysothamnus nauseosus	-	-	.41	-	0	.45	.08
B	Chrysothamnus nauseosus hololeucus	.30	1.92	1.81	2.39	2.93	2.06	2.31
B	Chrysothamnus viscidiflorus viscidiflorus	-	-	.00	-	-	-	-
B	Gutierrezia sarothrae	.21	.18	.64	.07	-	.90	.06
B	Juniperus osteosperma	.85	-	-	-	-	-	-
B	Opuntia sp.	.24	.15	.00	.03	-	-	.01
B	Pinus edulis	.15	-	-	-	.10	-	-
Total for Browse		1.94	2.40	2.88	2.49	3.53	3.41	2.46

BASIC COVER--

Management unit 24, Study no: 12

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	16.23	12.96	11.71	19.82
Rock	2.74	6.09	6.03	10.12
Pavement	18.25	18.93	32.58	18.63
Litter	41.14	39.43	36.91	33.78
Cryptogams	.09	0	0	.03
Bare Ground	21.42	30.42	20.55	28.42

PELLET GROUP DATA--

Management unit 24, Study no: 12

Type	Quadrat Frequency			
	'97	'03	'08	'13
Rabbit	8	42	96	33
Elk	20	15	8	19
Deer	21	9	6	18
Cattle	-	-	-	5

Days use per acre (ha)		
'03	'08	'13
-	-	-
16 (40)	7 (18)	32 (79)
1 (3)	1 (3)	7 (18)
2 (5)	2 (5)	12 (29)

BROWSE CHARACTERISTICS--

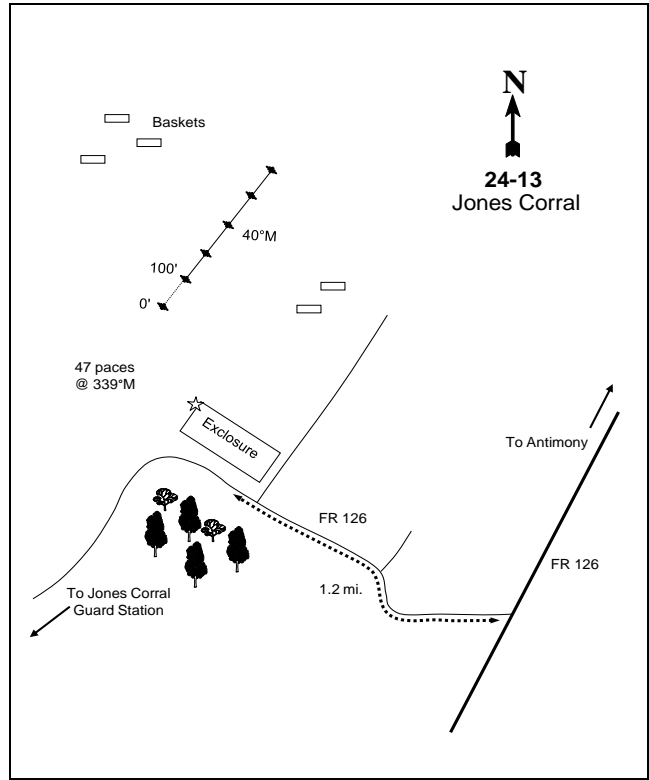
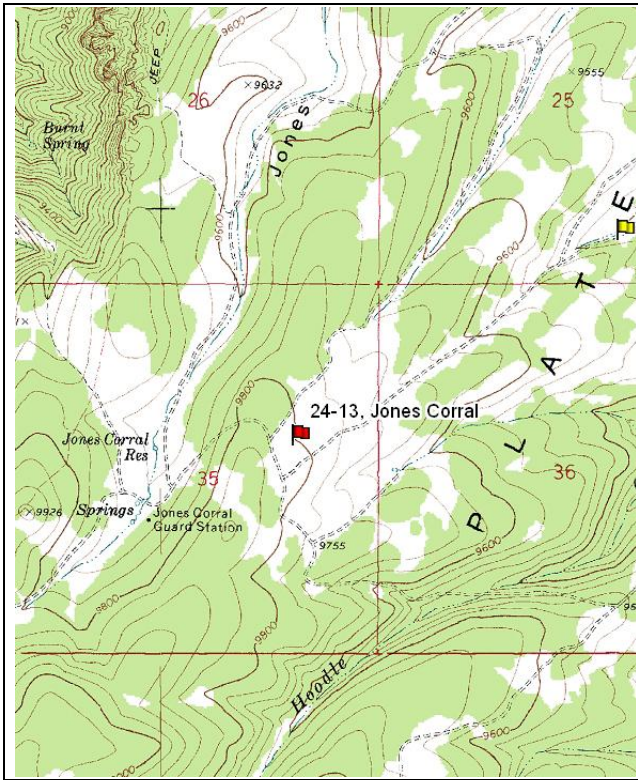
Management unit 24, Study no: 12

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 nova</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	17/42
<i>Artemisia tridentata vaseyana</i>									
97	20	0	100	0	-	0	0	0	-/-
03	20	0	0	100	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	34/43
13	0	0	0	0	-	0	0	0	11/14
<i>Chrysothamnus nauseosus</i>									
97	0	0	0	0	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	-/-
08	60	0	100	0	200	0	0	0	39/57
13	20	0	0	100	-	0	100	0	39/61
<i>Chrysothamnus nauseosus hololeucus</i>									
97	220	45	45	9	-	0	0	9	32/45
03	340	0	94	6	-	6	0	0	29/44
08	480	58	38	4	1560	0	0	4	34/50
13	700	20	63	17	20	17	14	14	31/47
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
97	0	0	0	-	-	0	0	0	13/20
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	40	0	0	0	16/16
13	0	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
97	200	0	100	0	-	0	0	0	9/13
03	160	75	25	0	280	0	0	0	6/5
08	1080	0	98	2	60	0	0	2	7/9
13	280	71	29	0	-	0	0	0	14/21
<i>Juniperus osteosperma</i>									
97	20	100	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
97	120	17	83	-	-	0	0	0	3/13
03	40	0	100	-	-	0	0	0	4/11
08	80	0	100	-	20	0	0	0	4/8
13	60	0	100	-	-	0	0	0	5/21

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Pinus edulis</i>										
97	<b>60</b>	100	0	-	20	0	0	0	-/-	
03	<b>20</b>	100	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
97	<b>20</b>	100	0	0	-	100	0	0	18/40	
03	<b>20</b>	0	0	100	-	0	0	100	22/60	
08	<b>20</b>	0	100	0	-	100	0	0	16/30	
13	<b>20</b>	100	0	0	-	0	0	0	27/60	



JONES CORRAL - TREND STUDY NO. 24-13



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Mount Dutton; Township 31S, Range 3W, Section 35  
NAD 83, UTM Zone 12, 398143 East 4214679 North

**Transect Information**

Browse Tag # (0' Stake) 162  
Transect Bearing 40° magnetic  
Length 500ft  
Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line (95ft)  
Belt Marker Placement Standard

**Directions to Site**

From the town of Antimony, drive on Mt. Dutton road for approximately 10 miles towards the Jones Corral Guard Station. At the fork turn right (west) and drive 1.2 miles towards the guard station. Stop at the enclosure on the right side of the road. From the northwest corner of the enclosure walk 47 paces at 339 degrees magnetic to the 0' stake. The 0' stake is marked by browse tag #162.

**Site Information**

Land Ownership USFS  
 Allotment Jones Corral C&H  
 Elevation 9,800ft (2,987m)  
 Aspect North  
 Slope 5%  
 Sample Dates 08/07/2003, 08/07/2008, 07/17/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer , Crucial Summer; Elk Substantial Summer, Calving; Sage-Grouse, Opportunity Not Winter

VEGETATION HISTORY--

Management unit 24, Study no: 13

Year	Vegetation Type <sup>1</sup>
2003-2013	Perennial Grass-Forb

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

Cover for wildlife is provided by large, old stands of quaking aspen (*Populus tremuloides*) surrounding the study site. The Jones Corral study site replaced the Suicide trend study (24-5) that was suspended in 2003. Elk pellet groups have been sampled in high abundance in 2003 and 2008, but in low abundance in 2013. Deer pellet groups have been sampled in low amounts over the duration of the study, and cattle pats have been sampled in moderate amounts over the same period (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 25 inches  
 NRCS Taxonomical soil Classification Clayey-skeletal, montmorillonitic Boralfic Cryoborolls  
 NRCS Ecological Site High Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB516UT

SOIL ANALYSIS DATA--

Management unit 24, Study no: 13

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	42.6	32.7	24.7	6.5	0.6	3.4	7.0	483.2	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [High Mountain Loam \(Mountain Big Sagebrush\), R047XA516UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since the establishment of the study in 2003, the site has consisted of a stable community of perennial grasses and forbs (Table - Herbaceous Trends). Shifts in frequency and cover within the *Poa* genera (*Poa* sp.) may be due to misidentification over the duration of the study. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) was recorded in density in 2008, and few sagebrush plants have been observed on or near the transect. This site will likely remain in a perennial grass and forb state for some time due to the lack of sagebrush plants on or near the study site.

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 24, Study no: 13

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Bromus inermis	<sub>a</sub> 113	<sub>b</sub> 201	<sub>b</sub> 214	3.08	4.85	4.44
G	Carex sp.	7	1	13	.06	.00	.50
G	Koeleria cristata	<sub>a</sub> -	<sub>b</sub> 13	<sub>b</sub> 11	-	.08	.08
G	Phleum pratense	<sub>a</sub> -	<sub>b</sub> 15	<sub>c</sub> 50	-	.20	1.01
G	Poa pratensis	<sub>a</sub> 72	<sub>b</sub> 142	<sub>c</sub> 227	2.66	3.29	6.88
G	Poa secunda	<sub>c</sub> 299	<sub>b</sub> 161	<sub>a</sub> 77	9.45	3.05	.93
G	Sitanion hystrix	<sub>b</sub> 24	<sub>a</sub> 10	<sub>ab</sub> 18	.60	.15	.13
G	Stipa columbiana	<sub>b</sub> 53	<sub>a</sub> -	<sub>a</sub> -	2.38	-	-
G	Stipa comata	-	2	-	-	.00	-
G	Stipa lettermani	<sub>a</sub> 100	<sub>b</sub> 167	<sub>c</sub> 221	2.44	5.23	6.27
G	Trisetum spicatum	<sub>b</sub> 26	<sub>a</sub> -	<sub>a</sub> -	.30	-	-
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		694	712	831	20.99	16.87	20.27
Total for Grasses		694	712	831	20.99	16.87	20.27
F	Achillea millefolium	<sub>a</sub> -	<sub>b</sub> 22	<sub>b</sub> 28	-	.20	.66
F	Agoseris glauca	<sub>a</sub> 4	<sub>ab</sub> 12	<sub>b</sub> 29	.01	.11	.13
F	Androsace septentrionalis (a)	-	1	1	-	.00	.00
F	Antennaria sp.	<sub>a</sub> 88	<sub>b</sub> 138	<sub>b</sub> 150	2.29	4.86	3.15
F	Arabis sp.	<sub>a</sub> -	<sub>a</sub> 4	<sub>b</sub> 26	-	.02	.05
F	Aster chilensis	<sub>a</sub> 100	<sub>b</sub> 163	<sub>b</sub> 155	1.43	3.78	3.77
F	Astragalus sp.	<sub>b</sub> 92	<sub>a</sub> -	<sub>a</sub> -	3.06	-	-
F	Collinsia parviflora (a)	<sub>a</sub> 16	<sub>a</sub> 9	<sub>b</sub> 54	.05	.02	.19
F	Collomia linearis (a)	-	-	5	-	-	.15
F	Erigeron eatonii	<sub>a</sub> 27	<sub>b</sub> 155	<sub>b</sub> 138	.32	3.70	2.57
F	Erigeron flagellaris	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 12	-	-	.10
F	Erigeron pumilus	2	-	6	.01	-	.06
F	Lomatium sp.	<sub>a</sub> -	<sub>b</sub> 10	<sub>b</sub> 10	-	.03	.05
F	Oenothera sp.	-	-	11	-	-	.07
F	Polygonum douglasii (a)	<sub>a</sub> 21	<sub>b</sub> 133	<sub>c</sub> 211	.09	.38	.82
F	Potentilla gracilis	70	72	88	1.59	2.13	2.74
F	Potentilla sp.	<sub>a</sub> -	<sub>b</sub> 27	<sub>a</sub> -	-	1.09	-
F	Taraxacum officinale	<sub>a</sub> 3	<sub>b</sub> 191	<sub>b</sub> 177	.00	4.48	4.37
F	Trifolium gymnocarpon	<sub>a</sub> 248	<sub>b</sub> 372	<sub>b</sub> 373	7.70	5.35	5.68
Total for Annual Forbs		37	143	271	0.14	0.41	1.16
Total for Perennial Forbs		634	1166	1203	16.43	25.78	23.43
Total for Forbs		671	1309	1474	16.57	26.19	24.60

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

BROWSE TRENDS--

Management unit 24, Study no: 13

Type	Species	Quadrat Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	-	.03	-	-	-	-
Total for Browse		0	0.03	0	0	0	0

BASIC COVER--

Management unit 24, Study no: 13

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	44.15	53.25	50.81
Rock	8.20	10.01	6.07
Pavement	13.69	8.84	3.53
Litter	12.75	13.53	21.73
Cryptogams	.99	.03	.11
Bare Ground	23.90	21.49	31.66

PELLET GROUP DATA--

Management unit 24, Study no: 13

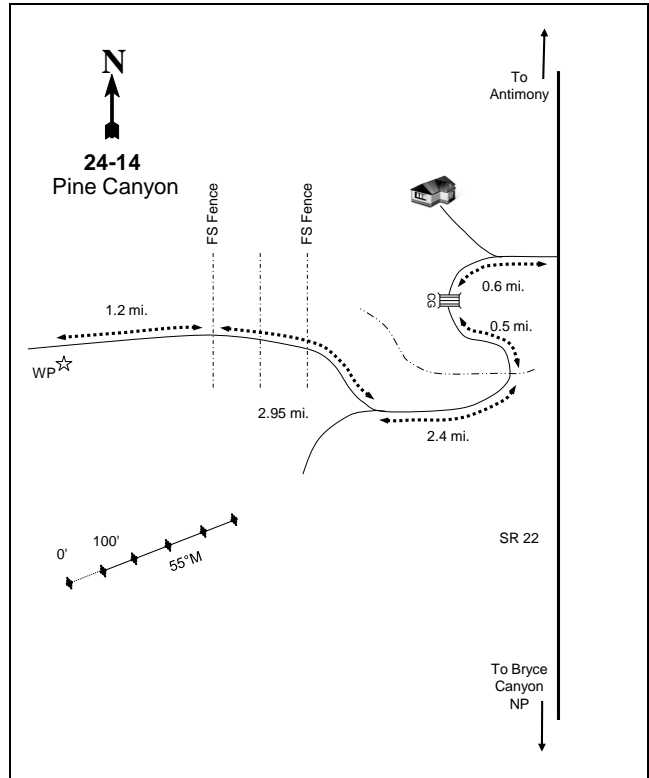
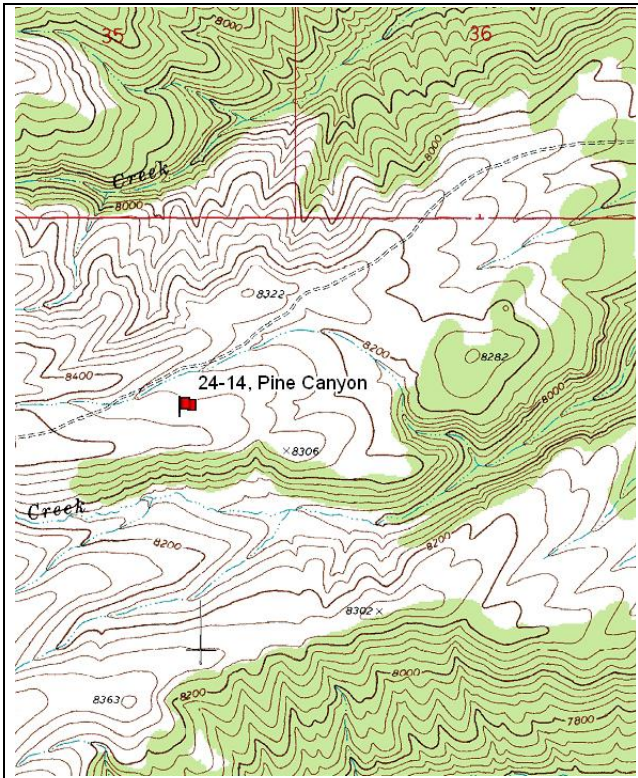
Type	Quadrat Frequency			Days use per acre (ha)		
	'03	'08	'13	'03	'08	'13
Sheep	-	1	-	-	-	-
Rabbit	1	1	-	-	-	-
Turkey	-	1	-	-	-	-
Elk	30	25	23	58 (144)	52 (127)	18 (45)
Deer	6	10	1	3 (7)	13 (31)	3 (7)
Cattle	5	18	16	23 (57)	34 (84)	26 (65)

BROWSE CHARACTERISTICS--

Management unit 24, 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		
Artemisia tridentata vaseyana									
03	0	0	0	-	-	0	0	0	10/18
08	20	100	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	14/19
Chrysothamnus viscidiflorus viscidiflorus									
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	11/23
13	0	0	0	-	-	0	0	0	13/20

PINE CANYON - TREND STUDY NO. 24-14



**Location Information**

USGS 7.5 min Map Info Deep Creek; Township 32S, Range 3W, Section 2  
 GPS (0' Stake) NAD 83, UTM Zone 12, 404794 East 4212004 North

**Transect Information**

Browse Tag # (0' Stake) 284  
 Transect Bearing 55° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

Turning from SR 22 onto Duncan road, travel 0.6 miles (while passing the WMA to the west) to a cattle-guard. Travel another 0.5 miles to the East Fork of the Sevier River. Cross the river. Travel 2.4 miles to a fork and stay right. Travel another 2.95 miles while passing through USFS boundary fences. From the last fence, travel another 1.2 mile and park. The 0 foot stake is identified by browse tag #284.

### Site Information

Land Ownership USFS  
Allotment Willow Spring C&H  
Elevation 8,346ft (2,544m)  
Aspect North  
Slope 7-10%  
Sample Dates 08/01/2013

### DISTURBANCE HISTORY--

Management unit 24, Study no: 14

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Prescribed fire	Sanford	-	2002	60,740

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer; Elk, Crucial Winter; Sage-grouse, Opportunity Not Winter

### VEGETATION HISTORY--

Management unit 24, Study no: 14

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2013	Perennial Grass	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

A soil sample will be collected the next time the site is read. Many of the plant species on the site are low growing. Islands of mountain snowberry (*Symphoricarpos oreophilus*) and rubber rabbitbrush (*Chrysothamnus nauseosus*) were observed at site establishment. Some grazing of Sandberg bluegrass (*Poa secunda*) and needle-and-thread (*Stipa comata*) were observed in 2013. Cattle were seen on the site in 2013, but few cattle pats were sampled.

### Site Potential

1981-2010 Average Annual Precipitation 17 inches  
NRCS Taxonomical soil Classification Clayey-skeletal, montmorillonitic Argic Pachic Cryoborolls  
NRCS Ecological Site Mountain Shallow Loam (Mountain Big Sagebrush)  
NRCS Ecological Site # R047XB446UT

### States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Shallow Loam \(Mountain Big Sagebrush\), R047XA446UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

After the Sanford fire in 2002, the site likely experienced a major compositional change from a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) community to a perennial grass community. Medium sized juniper skeletal remains were observed near the study site. At the time of site establishment in 2013, the site was mainly comprised of the perennial grass species Sandberg bluegrass and blue grama (*Bouteloua gracilis*) (Table - Herbaceous Trends). Broom snakeweed (*Gutierrezia sarothrae*) was the dominant browse species on the site (Table - Browse Trends). Reestablishment of sagebrush on the site appears to be slow with only a few plants being sampled on the site eleven years post fire (Table - Browse Characteristics). Over time and without disturbance, sagebrush will likely become a major component of the site.

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 24, Study no: 14

Type	Species	Nested	Average
		Frequency	Cover %
		'13	'13
G	Agropyron cristatum	3	.03
G	Bouteloua gracilis	162	6.81
G	Oryzopsis hymenoides	12	.27
G	Poa fendleriana	3	.00
G	Poa secunda	327	7.80
G	Sitanion hystrix	11	.10
G	Stipa comata	79	1.20
G	Stipa lettermani	16	.16
Total for Annual Grasses		0	0
Total for Perennial Grasses		613	16.38
Total for Grasses		613	16.38
F	Antennaria sp.	2	.00
F	Arabis sp.	34	.11
F	Astragalus convallarius	6	.01
F	Cryptantha sp.	25	.17
F	Erigeron sp.	27	.14
F	Eriogonum racemosum	14	.10
F	Linum lewisii	1	.00
F	Lygodesmia spinosa	6	.15
F	Microsteris gracilis (a)	3	.00
F	Petradoria pumila	5	.18
F	Phlox longifolia	83	.28
F	Senecio multilobatus	12	.11
F	Sphaeralcea coccinea	2	.00
F	Trifolium sp.	3	.00
Total for Annual Forbs		3	0.00
Total for Perennial Forbs		220	1.31
Total for Forbs		223	1.31

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

BROWSE TRENDS--

Management unit 24, Study no: 14

Type	Species	Quadrat Cover %	Line Intercept Cover %
		'13	'13
B	Artemisia nova	.15	-
B	Artemisia tridentata vaseyana	.02	-
B	Chrysothamnus nauseosus	.84	-
B	Chrysothamnus parryi	-	.16
B	Chrysothamnus viscidiflorus viscidiflorus	1.27	1.90
B	Gutierrezia sarothrae	6.43	8.38
B	Tetradymia canescens	.16	.51
Total for Browse		8.88	10.95

BASIC COVER--

Management unit 24, Study no: 14

Cover Type	Average Cover %
	'13
Vegetation	31.95
Rock	12.75
Pavement	37.00
Litter	20.25
Bare Ground	5.49

PELLET GROUP DATA--

Management unit 24, Study no: 14

Type	Quadrat Frequency	Days use per acre (ha)
	'13	'13
Elk	14	25 (63)
Deer	2	1 (3)
Cattle	3	9 (23)

BROWSE CHARACTERISTICS--

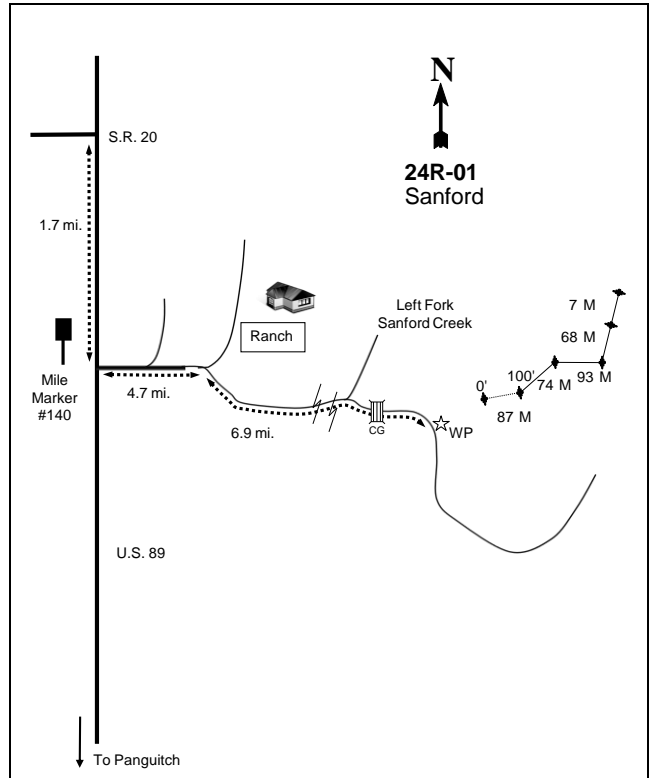
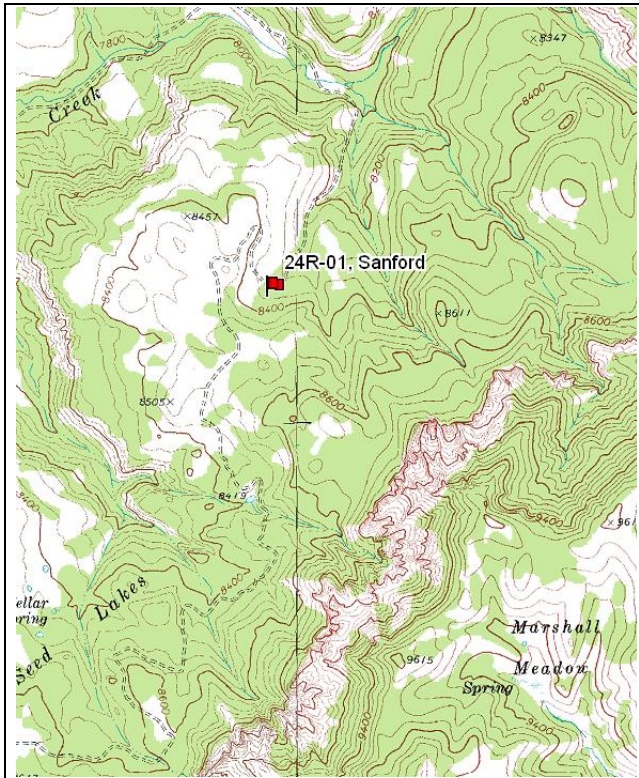
Management unit 24, Study no: 14

		Age class distribution			Utilization				
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
		Artemisia nova							
13	<b>0</b>	0	0	-	-	0	0	0	8/16
Artemisia tridentata vaseyana									
13	<b>100</b>	60	40	-	260	20	20	0	10/20



		Age class distribution					Utilization			
Y e a r	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Chrysothamnus nauseosus										
13	<b>20</b>	100	0	-	-	0	100	100	-/-	
Chrysothamnus parryi										
13	<b>800</b>	5	95	-	-	30	5	18	7/18	
Chrysothamnus viscidiflorus viscidiflorus										
13	<b>1260</b>	13	87	-	80	21	35	8	5/13	
Eriogonum microthecum										
13	<b>0</b>	0	0	-	-	0	0	0	10/17	
Gutierrezia sarothrae										
13	<b>38060</b>	29	71	-	860	0	0	4	4/6	
Pediocactus simpsonii										
13	<b>120</b>	0	100	-	-	0	0	0	2/2	
Tetradymia canescens										
13	<b>260</b>	0	100	-	20	62	0	0	8/15	

SANFORD - TREND STUDY NO. 24R-1



**Location Information**

USGS 7.5 min Map Info Blind Spring Mountain; Township 33S, Range 4W, Section 20  
 GPS (0' Stake) NAD 83, UTM Zone 12, 389938 East 4197851 North

**Transect Information**

Browse Tag # (0' Stake) 167  
 Transect Bearing 87° magnetic (Line 2: 74° magnetic, Line 3: 93° magnetic, Line 4: 68° magnetic, Line 5: 7° magnetic)  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

Travel south from the junction of highway 89 and SR 20 on highway 89 for 1.7 miles. Make a left turn. Travel 4.7 miles east keeping right at all forks until you come to a fork with a sign to Sanford Creek. Turn right at the fork. Travel 6.9 miles up Sanford Creek Canyon to the witness post on the left side of the road. You will cross the creek several times as you go up the canyon. Stay right at the fork part way up the canyon. The 0' stake is 27 paces at 185 degrees magnetic from the witness post. The 0' stake is a half-high steel post marked by browse tag #167 and the remaining stakes are rebar. The transect line has the following bearings: line 1, 87°M; line 2, 74°M; line 3, 93°M; line 4, 68°M; and line 5, 7°M.

**Site Information**

Land Ownership USFS  
 Allotment Clark Mountain C&H  
 Elevation 8,420ft (2,566m)  
 Aspect North  
 Slope 12%  
 Sample Dates 07/23/1998, 07/10/2003, 07/09/2008, 07/16/2013

**DISTURBANCE HISTORY--**

Management unit 24R, Study no: 1

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Prescribed Fire	Sanford	-	2002	60,740
Seeding	-	-	2002	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer, Calving

**VEGETATION HISTORY--**

Management unit 24R, Study no: 1

Year	Vegetation Type <sup>1</sup>
1998-2003	Douglas Fir-White Fir/Quaking Aspen
2008-2013	Quaking Aspen

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

Coarse woody debris and high densities of quaking aspen (*Populus tremuloides*) saplings may impede big game movement through the area. Point-quarter data will be collected during the next sampling. In 2013, nearly all of the aspen were insect infested with many of the trees producing galls. Fresh deer pellet groups were sampled often on the upper north facing aspect.

**Site Potential**

1981-2010 Average Annual Precipitation 19 inches  
 NRCS Taxonomical soil Classification Fine, mixed Argic Cryoborolls  
 NRCS Ecological Site High Mountain Loam (Aspen)  
 NRCS Ecological Site # R047XB508UT

**SOIL ANALYSIS DATA--**

Management unit 24R, Study no: 1

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	58.0	23.4	18.6	5.4	0.9	4.9	20.9	425.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1998, the site was a mixed stand of Douglas fir (*Pseudotsuga menziesii*), quaking aspen, and ponderosa pine (*Pinus ponderosa*). Additionally, the perennial grass and forb communities were moderately diverse, with mountain brome (*Bromus carinatus*) and Colorado columbine (*Aquilegia caerulea*) being the most prevalent grass and forb species, respectively. The Sanford fire in 2002 set back the succession of this high mountain community, transitioning from conifer encroached community to a quaking aspen

community. Since the 2003 sampling, the over-story has increased in diversity with quaking aspen being the dominant species (Table - Browse Trends). The herbaceous understory has also increased in diversity (Table - Herbaceous Trends).

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 24R, Study no: 1

T y P e	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	-	-	5	3	-	-	.03	.03
G	Agropyron intermedium	a-	a-	b14	a-	-	-	.28	-
G	Bromus carinatus	b67	a-	a-	a7	1.78	-	-	.21
G	Bromus inermis	a-	a2	b61	c119	-	.03	1.82	3.28
G	Bromus tectorum (a)	a-	a-	b14	a4	-	-	.36	.01
G	Carex sp.	3	-	3	6	.03	-	.00	.25
G	Dactylis glomerata	ab20	a-	b46	a-	.28	-	.78	-
G	Festuca ovina	a8	a-	a-	ab10	.03	-	-	.15
G	Poa fendleriana	a-	a6	b43	b45	-	.01	.91	1.50
G	Poa pratensis	b36	a2	b31	ab29	.32	.03	.96	.83
G	Sitanion hystrix	a-	ab22	b39	c113	-	.32	1.63	3.43
G	Stipa columbiana	b40	a28	bc64	c124	.42	.41	3.05	5.78
G	Stipa lettermani	a11	a-	ab17	b34	.01	-	.21	.84
Total for Annual Grasses		0	0	14	4	0	0	0.36	0.01
Total for Perennial Grasses		185	60	323	490	2.89	0.82	9.70	16.32
Total for Grasses		185	60	337	494	2.89	0.82	10.06	16.33
F	Achillea millefolium	ab35	a6	bc45	c74	.87	.07	.54	1.79
F	Androsace septentrionalis (a)	4	11	23	18	.01	.05	.07	.23
F	Antennaria sp.	b35	a3	a4	a6	1.25	.06	.03	.06
F	Aquilegia caerulea	b52	a-	a-	a-	1.48	-	-	-
F	Arabis fendleri	-	-	-	2	-	-	-	.03
F	Arabis sp.	3	-	10	8	.00	-	.01	.04
F	Arenaria fendleri	14	-	2	-	.10	-	.00	-
F	Astragalus miser	b33	a6	a15	ab25	.95	.07	.24	.55
F	Castilleja sp.	2	-	-	-	.03	-	-	-
F	Chenopodium fremontii (a)	a-	b31	ab13	a7	-	.79	.05	.01
F	Cirsium sp.	-	-	-	3	-	-	.03	.03
F	Clematis ligusticifolia	-	-	1	-	-	-	.15	.03
F	Collomia linearis (a)	a-	a7	b29	a3	-	.04	.10	.00
F	Descurainia richardsonii (a)	-	-	-	8	-	-	-	.01
F	Epilobium brachycarpum (a)	-	-	-	7	-	-	-	.06
F	Erigeron eatonii	ab21	a11	b35	ab20	.22	.07	.61	.42
F	Erigeron flagellaris	a-	a-	ab18	b24	-	-	1.08	.20
F	Eriogonum umbellatum	-	-	-	4	-	-	-	.00
F	Fragaria virginiana	a2	a6	b52	b40	.03	.05	1.66	.89
F	Geranium richardsonii	3	-	1	-	.03	-	.01	-
F	Ipomopsis aggregata	-	-	3	6	-	-	.00	.04

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Lappula occidentalis (a)	-	-	10	2	-	-	.07	.00
F	Lotus utahensis	3	-	-	1	.00	-	.00	.03
F	Lupinus argenteus	<sub>a</sub> 3	<sub>a</sub> -	<sub>ab</sub> 8	<sub>b</sub> 19	.03	-	.07	.34
F	Microsteris gracilis (a)	-	-	4	-	-	-	.00	-
F	Orthocarpus luteus (a)	1	-	-	-	.00	-	-	-
F	Polygonum douglasii (a)	<sub>a</sub> 5	<sub>ab</sub> 13	<sub>b</sub> 32	<sub>a</sub> -	.01	.10	.50	-
F	Potentilla sp.	5	-	-	-	.04	-	-	-
F	Senecio multilobatus	-	-	5	5	-	-	.03	.03
F	Taraxacum officinale	<sub>a</sub> 33	<sub>a</sub> 9	<sub>b</sub> 249	<sub>b</sub> 255	.65	.21	9.64	6.44
F	Thalictrum fendleri	-	2	-	3	-	.15	.00	.38
F	Tragopogon dubius (a)	4	-	3	-	.03	-	.00	-
F	Verbascum thapsus	-	-	-	4	-	-	-	.03
F	Viola sp.	10	2	4	8	.12	.03	.01	.12
Total for Annual Forbs		14	62	114	45	0.06	0.99	0.81	0.33
Total for Perennial Forbs		254	45	452	507	5.84	0.72	14.17	11.48
Total for Forbs		268	107	566	552	5.90	1.71	14.98	11.82

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

#### BROWSE TRENDS--

Management unit 24R, Study no: 1

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	-	-	-	.30	-	.48	2.75
B	Chrysothamnus nauseosus	-	-	.03	-	-	-	
B	Chrysothamnus viscidiflorus viscidiflorus	-	-	-	.39	-	-	.38
B	Juniperus communis	5.31	-	-	-	-	-	-
B	Mahonia repens	2.38	.36	7.29	4.20	.16	7.86	6.01
B	Pinus ponderosa	.15	-	-	-	2.00	3.65	2.50
B	Populus tremuloides	.24	1.62	6.94	5.67	4.81	17.03	25.65
B	Pseudotsuga menziesii	9.45	.64	1.39	1.89	5.45	4.50	7.33
B	Rosa woodsii	.41	.03	.04	.39	.08	.73	1.23
B	Sambucus sp.	-	-	.34	.15	-	.73	.96
B	Symphoricarpos oreophilus	4.87	.84	3.72	4.36	.60	5.86	7.66
Total for Browse		22.82	3.49	19.75	17.37	13.1	40.84	54.47

#### POINT-QUARTER TREE DATA--

Management unit 18R, Study no: 1

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Populus tremuloides	88	-	-	-	6.1	-	-	-
Pseudotsuga menziesii	376	-	-	-	2.5	-	-	-

**BASIC COVER--**

Management unit 24R, Study no: 1

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	33.26	6.66	44.19	46.99
Rock	.22	.67	.51	.55
Pavement	.01	.01	.40	.11
Litter	94.35	69.68	54.26	67.55
Cryptogams	.22	.00	1.24	1.39
Bare Ground	.19	26.15	13.94	6.45

**PELLET GROUP DATA--**

Management unit 24R, Study no: 1

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	-	-	3	-	-	-	-	-
Elk	-	-	7	3	1 (2)	1 (2)	7 (17)	4 (10)
Deer	1	3	4	10	17 (24)	5 (12)	13 (33)	26 (65)
Cattle	2	-	2	1	-	-	7 (16)	1 (2)

**BROWSE CHARACTERISTICS--**

Management unit 24R, Study no: 1

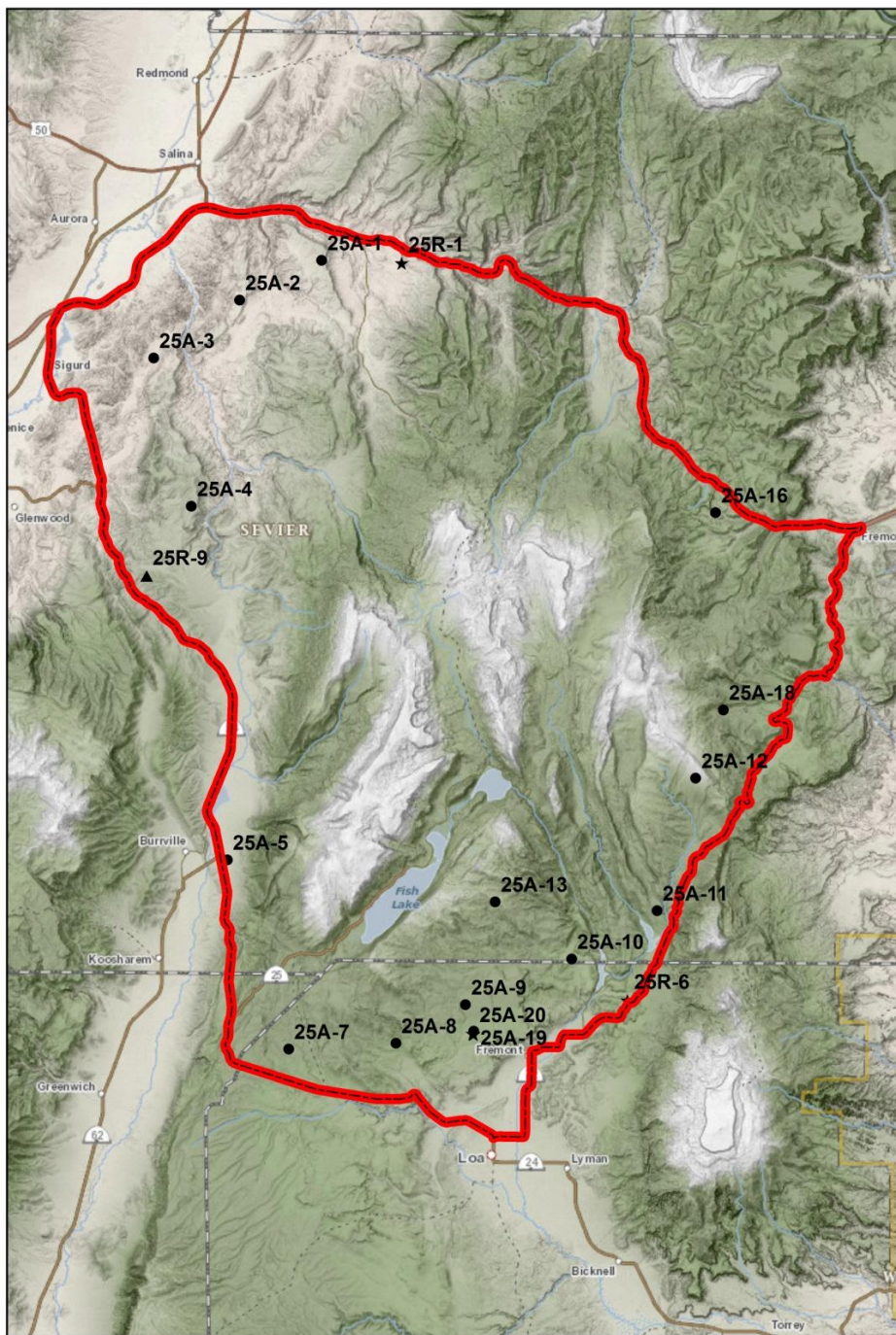
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier alnifolia</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	80	100	0	-	-	0	0	0	18/12
13	0	0	0	-	-	0	0	0	-/-
<b>Artemisia tridentata vaseyana</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	19/28
13	40	0	100	-	20	0	0	0	23/38
<b>Cercocarpus montanus</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	20	100	0	-	-	0	0	0	-/-
<b>Chrysothamnus nauseosus</b>									
98	0	0	0	0	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	-/-
08	40	0	50	50	-	0	0	0	16/16
13	40	0	50	50	-	0	0	0	27/27

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>Chrysothamnus viscidiflorus viscidiflorus</i>									
98	0	0	0	0	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	-/-
08	20	0	100	0	-	0	0	0	13/19
13	100	20	60	20	-	0	0	0	18/17
<i>Gutierrezia sarothrae</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	8/8
13	0	0	0	-	-	0	0	0	-/-
<i>Juniperus communis</i>									
98	760	11	87	3	-	0	0	11	24/32
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	8/25
<i>Mahonia repens</i>									
98	4740	13	87	0	-	3	0	0	6/9
03	1820	51	49	0	-	0	0	0	4/6
08	11900	0	98	1	180	0	0	1	6/10
13	13860	0	100	0	-	0	0	0	5/7
<i>Pinus ponderosa</i>									
98	60	67	33	-	20	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	40	50	50	-	60	0	0	0	-/-
13	20	0	100	-	-	0	0	0	-/-
<i>Populus tremuloides</i>									
98	680	79	21	0	-	0	0	0	-/-
03	2220	100	0	0	-	0	0	0	19/13
08	3860	15	84	1	20	2	0	1	-/-
13	3560	94	6	0	100	0	0	3	-/-
<i>Pseudotsuga menziesii</i>									
98	1440	72	28	0	280	0	0	0	-/-
03	240	75	17	8	20	0	0	17	-/-
08	180	78	11	11	60	0	0	11	-/-
13	180	78	22	0	80	0	0	0	-/-
<i>Ribes sp.</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	32/22

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Rosa woodsii</i>										
98	<b>220</b>	73	27	-	-	0	0	0	20/23	
03	<b>240</b>	58	42	-	20	0	0	0	4/4	
08	<b>500</b>	28	72	-	-	0	0	0	12/15	
13	<b>780</b>	23	77	-	-	0	0	0	17/11	
<i>Sambucus sp.</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>540</b>	81	19	-	100	0	0	0	61/54	
13	<b>60</b>	67	33	-	-	0	0	0	60/57	
<i>Symphoricarpos oreophilus</i>										
98	<b>6060</b>	39	61	0	260	0	0	0	14/15	
03	<b>940</b>	77	23	0	-	0	0	0	11/19	
08	<b>1360</b>	9	90	1	20	7	0	0	15/29	
13	<b>1620</b>	27	73	0	-	0	0	0	17/37	



# WILDLIFE MANAGEMENT UNIT 25A - FISH LAKE

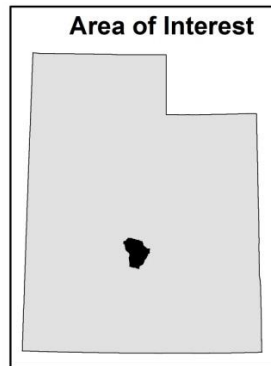


**Unit - 25A**

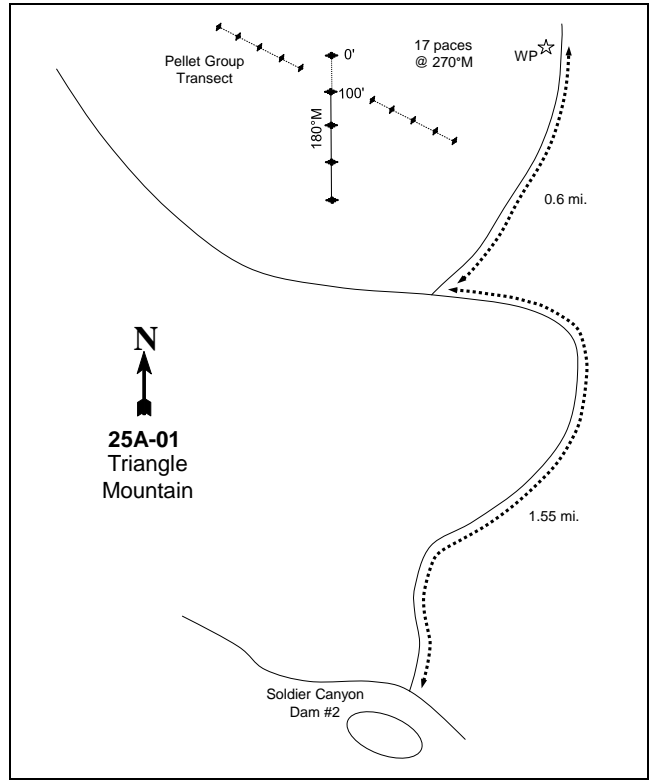
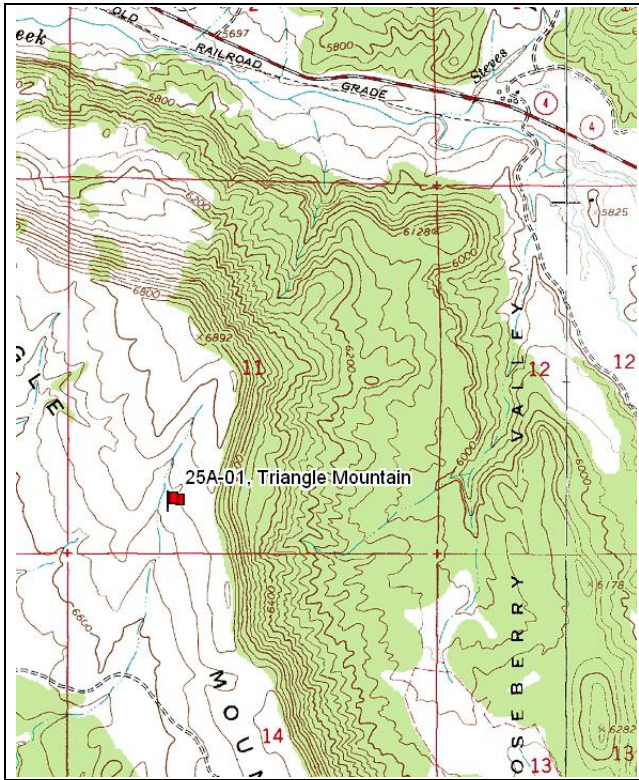
**Study Location**

**Project, Status**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active
- ★ WRI, Suspended



TRIANGLE MOUNTAIN - TREND STUDY NO. 25A-1



**Location Information**

USGS 7.5 min Map Info Salina; Township 22S, Range 1E, Section 11  
 GPS (0' Stake) NAD 83, UTM Zone 12, 433160 East 4306454 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 180° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the Gooseberry Creek Road outside Salina, take the Soldier Canyon Road west approximately 2.5 miles to Soldier Canyon Dam #2. At the dam, turn right up the road to Triangle Mountain. Go 1.55 miles to a fork. Take the right fork 0.6 miles to the top of a low rise between 2 small draws. Walk 17 paces due west of the road to the 0-foot baseline stake, which is a 4-foot rebar. A pellet group transect crosses the frequency baseline at the 100-foot mark.

**Site Information**

Land Ownership USFS  
 Allotment Browns Hole  
 Elevation 6,700ft (2,042m)  
 Aspect Southwest  
 Slope 5-10%  
 Sample Dates 07/03/1985, 06/26/1991, 08/12/1999, 08/24/2004, 06/11/2009, 08/22/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 1

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining	-	-	1970	-
Seeding	-	-	1970	-
Harrow (2-Way Dixie)	Fishlake NF PJ Maintenance-Sagebrush Enhancement - Year 1	<a href="#">216</a>	Fall 2005	4,079
Seeding (Broadcast)	Fishlake NF PJ Maintenance-Sagebrush Enhancement - Year 1	<a href="#">216</a>	Fall 2005	1,600

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 25A, Study no: 1

Project Name: Fishlake NF PJ Maintenance		
WRI Database #: <a href="#">216</a>		
Application: Broadcast Seed	Acres: 1600	
Seed Type	lbs in mix	lbs/acre
G Mountain Bromegrass	3215	2.01
G Slender Wheatgrass	3213	2.01
G Thickspike Wheatgrass 'Critana'	3200	2.00
F Alfalfa 'Ladak'	1600	1.00
F Blue Flax	1400	0.90
F Sainfoin 'Eski'	1600	1.00
F Small Burnett	1600	1.00
Total Pounds:	15828	9.92
PLS Pounds:	14608	9.13

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 1

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-1991	Perennial Grass	Phase I
1999-2004	Perennial Grass/Pinyon-Juniper	Phase I transitioning to Phase II
2009-2013	Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The site may have been treated by a brush saw or lop-and-scatter.

### Site Potential

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Shallow Loam \(Pinyon-Utah Juniper\)](#)  
 NRCS Ecological Site # R047XB326UT

### SOIL ANALYSIS DATA--

Management unit 25A, Study no: 1

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	40	34.7	25.3	7.6	0.7	5.8	6.5	243.2	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

When established in 1985, the site was dominated by seeded introduced perennial grass species (Appendix B - Pre-1992 Data). Young pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) had begun to reestablish back onto the site following the chaining in 1970. The site began to transition from a phase I woodland succession to a phase II before it was retreated in 2005 (Table - Disturbance History). Following the retreatment, the site remained in a seeded introduced perennial grass state. Forbs and shrubs have remained a minor component on the site over the sampled years (Table - Browse Trends, Table - Herbaceous Trends).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 25A, study no: 1

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	0.0	0.0	0.0	23.2	0.0	7.3	0.0	<b>30.6</b>	Very Poor
2004	0.2	0.0	0.0	30.0	-0.1	1.1	0.0	<b>31.2</b>	Very Poor
2009	0.9	0.0	0.0	30.0	0.0	2.0	0.0	<b>32.8</b>	Very Poor
2013	0.9	0.0	0.0	30.0	0.0	1.3	0.0	<b>32.2</b>	Very Poor

### HERBACEOUS TRENDS--

Management unit 25A, Study no: 1

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	<i>Agropyron cristatum</i>	<sub>b</sub> 284	<sub>a</sub> 236	<sub>b</sub> 290	<sub>c</sub> 332	7.19	13.39	15.72	16.67
G	<i>Agropyron intermedium</i>	204	180	209	199	2.45	4.88	6.44	4.21
G	<i>Agropyron spicatum</i>	<sub>ab</sub> 2	<sub>a</sub> -	<sub>b</sub> 13	<sub>ab</sub> 7	.00	-	.12	.21
G	<i>Bromus inermis</i>	-	-	-	5	-	-	-	.15
G	<i>Bromus tectorum</i> (a)	<sub>ab</sub> 7	<sub>b</sub> 21	<sub>b</sub> 16	<sub>a</sub> -	.02	.11	.05	-
G	<i>Elymus junceus</i>	<sub>c</sub> 103	<sub>a</sub> 26	<sub>b</sub> 63	<sub>bc</sub> 65	1.76	.59	2.59	2.89
G	<i>Elymus salina</i>	<sub>a</sub> -	<sub>b</sub> 19	<sub>a</sub> 1	<sub>a</sub> -	-	.99	.15	-
G	<i>Oryzopsis hymenoides</i>	1	2	-	1	.00	.06	-	.03

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	<i>Poa secunda</i>	<sub>b</sub> 31	<sub>b</sub> 20	<sub>a</sub> -	<sub>b</sub> 26	.20	.13	-	.30
	Total for Annual Grasses	7	21	16	0	0.02	0.11	0.05	0
	Total for Perennial Grasses	625	483	576	635	11.62	20.05	25.03	24.47
	Total for Grasses	632	504	592	635	11.64	20.16	25.08	24.47
F	<i>Alyssum alyssoides</i> (a)	<sub>b</sub> 300	<sub>a</sub> 226	<sub>bc</sub> 340	<sub>c</sub> 365	1.41	1.14	4.06	1.73
F	<i>Antennaria</i> sp.	7	2	2	1	.04	.01	.03	.00
F	<i>Aster</i> sp.	1	-	-	-	.00	-	-	-
F	<i>Astragalus</i> sp.	<sub>ab</sub> 6	<sub>a</sub> 2	<sub>b</sub> 14	<sub>ab</sub> 6	.21	.00	.20	.01
F	<i>Cryptantha</i> sp.	<sub>b</sub> 61	<sub>a</sub> 1	<sub>a</sub> -	<sub>a</sub> -	.92	.00	-	-
F	<i>Descurainia pinnata</i> (a)	-	4	-	3	-	.02	-	.00
F	<i>Erigeron pumilus</i>	-	-	-	1	-	-	-	.00
F	<i>Gilia</i> sp. (a)	-	-	-	-	-	.00	-	-
F	<i>Linum lewisii</i>	-	-	4	-	-	-	.01	-
F	<i>Lithospermum ruderales</i>	3	-	-	4	.03	-	-	.06
F	<i>Medicago sativa</i>	<sub>b</sub> 108	<sub>a</sub> 25	<sub>a</sub> 25	<sub>a</sub> 10	2.43	.47	.67	.19
F	<i>Melilotus officinalis</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 13	-	-	-	.21
F	<i>Penstemon</i> sp.	-	-	3	-	-	-	.03	-
F	<i>Phlox austromontana</i>	1	2	2	3	.00	.01	.03	.15
F	<i>Ranunculus testiculatus</i> (a)	<sub>a</sub> 4	<sub>d</sub> 222	<sub>c</sub> 136	<sub>b</sub> 82	.00	2.35	1.97	.17
F	<i>Salsola iberica</i> (a)	-	-	-	2	-	-	-	.00
F	<i>Streptanthus cordatus</i>	-	4	-	1	-	.03	-	.00
F	<i>Tragopogon dubius</i> (a)	-	-	-	2	-	-	-	.03
	Total for Annual Forbs	304	452	476	454	1.42	3.53	6.04	1.94
	Total for Perennial Forbs	187	36	50	39	3.66	0.53	0.98	0.65
	Total for Forbs	491	488	526	493	5.08	4.06	7.02	2.59

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 1

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia nova</i>	.01	.18	.71	.71	.88	.76	.85
B	<i>Chrysothamnus nauseosus</i>	-	-	.03	.03	-	-	-
B	<i>Chrysothamnus viscidiflorus</i>	-	.15	-	-	.03	-	-
B	<i>Gutierrezia sarothrae</i>	-	-	.30	.19	.48	.50	.35
B	<i>Juniperus osteosperma</i>	-	1.18	1.00	1.29	1.40	1.28	1.98
B	<i>Pinus edulis</i>	.48	-	-	-	-	-	-
	Total for Browse	0.49	1.51	2.04	2.22	2.79	2.54	3.24

POINT-QUARTER TREE DATA--

Management unit 25A, Study no: 1

Species	Trees per Acre			
	'99	'04	'09	'13
Juniperus osteosperma	35	34	24	26
Pinus edulis	43	33	20	21

Average diameter (in)			
'99	'04	'09	'13
5.3	4.8	4.1	2.8
4.0	5.6	4.7	3.1

BASIC COVER--

Management unit 25A, Study no: 1

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	19.34	26.27	35.95	32.02
Rock	4.50	6.74	4.12	2.60
Pavement	10.88	23.19	6.56	7.91
Litter	26.33	31.03	41.55	54.43
Cryptogams	1.20	2.28	.39	.14
Bare Ground	18.20	18.53	33.67	13.14

PELLET GROUP DATA--

Management unit 25A, Study no: 1

Type	Quadrat Frequency			
	'99	'04	'09	'13
Rabbit	27	44	11	14
Elk	18	12	34	35
Deer	18	16	17	5
Cattle	10	12	8	4

Days use per acre (ha)			
'99	'04	'09	'13
-	-	-	-
66 (162)	12 (30)	51 (127)	44 (109)
21 (53)	10 (25)	4 (10)	-
49 (120)	5 (13)	38 (93)	12 (30)

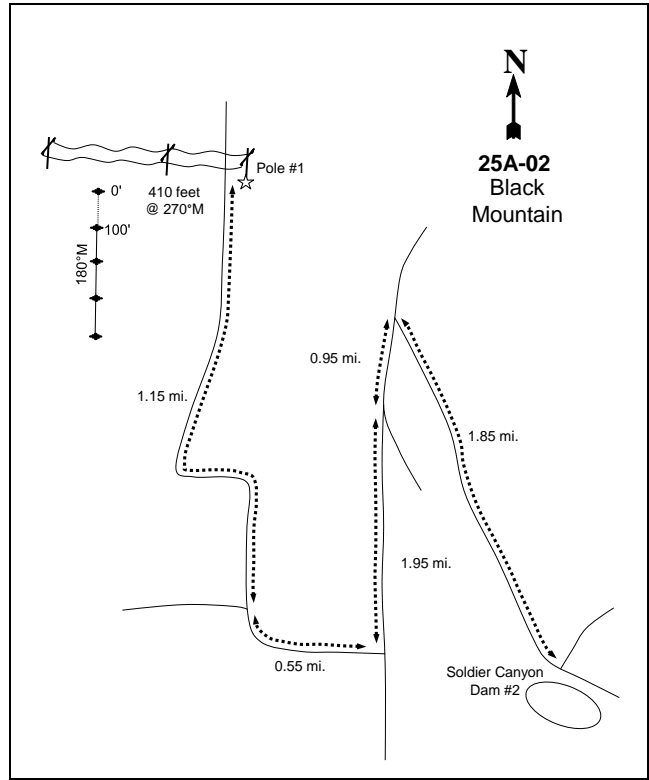
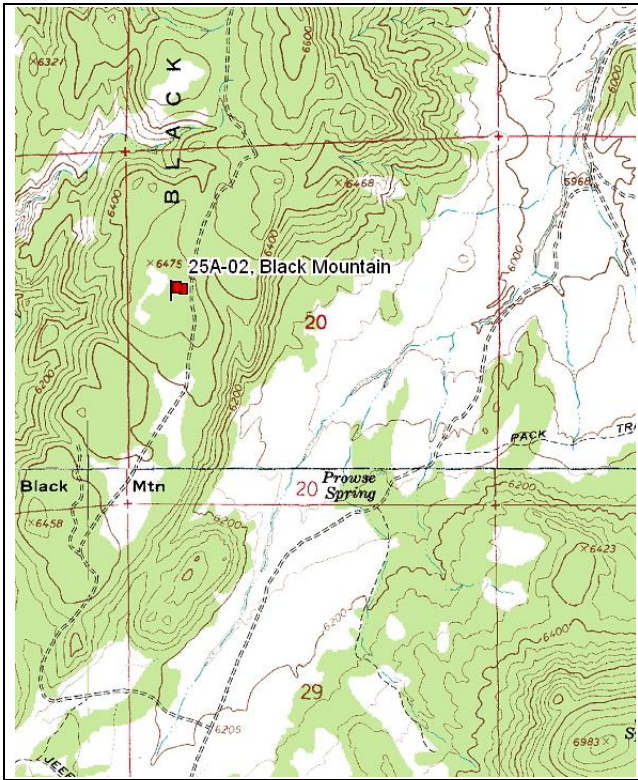
BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 1

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Artemisia nova</b>										
99	<b>480</b>	38	63	0	40	29	0	0	15/23	
04	<b>420</b>	0	81	19	-	19	0	5	11/18	
09	<b>420</b>	14	86	0	-	5	0	5	12/24	
13	<b>380</b>	5	95	0	-	11	16	0	11/25	
<b>Chrysothamnus nauseosus</b>										
99	<b>40</b>	50	50	-	-	0	0	0	18/16	
04	<b>0</b>	0	0	-	-	0	0	0	17/19	
09	<b>20</b>	0	100	-	-	0	0	0	24/31	
13	<b>20</b>	100	0	-	-	0	0	0	34/51	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus nauseosus hololeucus</b>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	26/40
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus</b>									
99	40	0	100	-	-	0	0	0	8/8
04	60	0	100	-	-	0	0	0	6/7
09	40	0	100	-	-	100	0	0	8/7
13	0	0	0	-	-	0	0	0	11/17
<b>Gutierrezia sarothrae</b>									
99	20	0	100	0	-	0	0	0	9/7
04	120	0	100	0	-	0	0	0	10/14
09	460	4	96	0	-	0	0	0	8/12
13	780	8	90	3	-	3	0	85	6/8
<b>Juniperus osteosperma</b>									
99	0	0	0	0	-	0	0	0	-/-
04	20	0	100	0	-	0	0	0	-/-
09	40	0	0	100	-	0	0	100	-/-
13	20	0	100	0	-	0	0	0	-/-
<b>Leptodactylon pungens</b>									
99	60	0	100	-	-	0	0	0	4/13
04	40	0	100	-	-	0	0	0	5/10
09	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	100	6/13
<b>Pinus edulis</b>									
99	60	0	100	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

BLACK MOUNTAIN - TREND STUDY NO. 25A-2



**Location Information**

USGS 7.5 min Map Info Salina; Township 22S, Range 1E, Section 20  
 GPS (0' Stake) NAD 83, UTM Zone 12, 428021 East 4303957 North

**Transect Information**

Browse Tag # (0' Stake) 7028  
 Transect Bearing 180° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

From Soldier Canyon Dam #2, proceed 1.85 miles west on the Soldier Canyon Road to the Black Mountain Road. Make a sharp left turn onto this road and travel south-southeast 0.95 miles to a junction. Take the right fork 0.85 miles to the double high-tension powerlines. The transect starts under these lines on the mesa to the right. Continue 1.1 miles beyond the powerlines to a 90-degree fork to the right. Turn right and go 0.55 miles to another fork. Stay to the right and proceed 1.15 miles up the hill and across a chaining until you are between the powerlines. Starting from the pole (#1) east of the road, pace off 410 feet west directly under the lines to the start of the frequency baseline which is 10 feet to the right.



**Site Information**

Land Ownership USFS  
 Allotment Browns Hole  
 Elevation 6,400ft (1,951m)  
 Aspect South  
 Slope 5%  
 Sample Dates 07/03/1985, 06/25/1991, 08/12/1999, 08/24/2004, 06/11/2009, 08/26/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 2

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining	-	-	1984	-
Seeding	-	-	1984	-
Harrow (2-Way Dixie)	Fishlake NF PJ Maintenance-Sagebrush Enhancement - Year 1	<a href="#">216</a>	Fall 2005	4,079
Seeding (Broadcast)	Fishlake NF PJ Maintenance-Sagebrush Enhancement - Year 1	<a href="#">216</a>	Fall 2005	1,600

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 25A, Study no: 1

Project Name: Fishlake NF PJ Maintenance		
WRI Database #: <a href="#">216</a>		
Application: Broadcast	Acres: 1600	
Seed Type	lbs in mix	lbs/acre
G Mountain Bromegrass	3215	2.01
G Slender Wheatgrass	3213	2.01
G Thickspike Wheatgrass 'Critana'	3200	2.00
F Alfalfa 'Ladak'	1600	1.00
F Blue Flax	1400	0.90
F Sainfoin 'Eski'	1600	1.00
F Small Burnett	1600	1.00
Total Pounds:	15828	9.92
PLS Pounds:	14608	9.13

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 2

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-1999	Perennial Grass	Phase I
2004-2013	Perennial Grass/Low Rabbitbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The site may have been treated by a brush saw or lop-and-scatter. The nearest water source is approximately one and half to two miles away. Deer pellet groups have been sampled in high abundance since 1999 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Not Available

NRCS Ecological Site  
NRCS Ecological Site #

[Upland Shallow Loam \(Pinyon-Utah Juniper\)](#)  
R047XB326UT

SOIL ANALYSIS DATA--

Management unit 25A, Study no: 2

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy clay loam	50	25.1	24.9	7.6	0.5	3.5	5.7	316.8	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions

No state and transition model is available for the above ecological site.

When established in 1985, the site was dominated by perennial grass species (Appendix B -Pre-1992 Data). Young pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) had begun to reestablish back onto the site following the chaining in 1984. The site was retreated in 2005 (Table - Disturbance History). Following the retreatment the site transitioned into a seeded introduced perennial grass state with some stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*). Forbs and shrubs have remained a minor component on the site over the sampled years (Table - Browse Trends, Table - Herbaceous Trends).

Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 25A, study no: 2

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	2.1	0.0	0.0	16.1	-1.0	0.2	0.0	17.5	Very Poor
2004	1.5	0.0	0.0	24.5	-0.1	0.0	0.0	25.8	Very Poor
2009	1.1	0.0	0.0	21.0	-0.4	0.3	0.0	22.0	Very Poor
2013	1.8	0.0	0.0	30.0	-0.3	0.3	0.0	31.8	Very Poor

HERBACEOUS TRENDS--

Management unit 25A, Study no: 2

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	a42	b108	b82	c160	.75	3.25	2.53	6.08
G	Agropyron intermedium	47	63	65	72	.89	1.27	.72	1.87
G	Agropyron smithii	-	-	2	-	-	-	.03	-
G	Agropyron spicatum	7	11	16	21	.09	.48	.36	.69
G	Bromus inermis	b83	a11	a11	a17	1.20	.12	.10	.42
G	Bromus tectorum (a)	c144	a15	a26	b67	1.32	.18	.52	.40
G	Elymus junceus	12	6	11	8	.11	.22	.24	.36
G	Festuca ovina	b30	a2	a-	a1	.37	.00	-	.18
G	Oryzopsis hymenoides	a105	ab117	b148	ab138	2.92	4.10	5.74	5.60
G	Poa fendleriana	7	2	-	-	.06	.03	-	-
G	Poa secunda	5	5	5	12	.06	.04	.04	.21
G	Sitanion hystrix	b85	b83	a33	a30	1.58	2.74	.73	1.18

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	<i>Stipa comata</i>	-	-	-	2	-	-	-	.03
	Total for Annual Grasses	144	15	26	67	1.32	0.18	0.52	0.40
	Total for Perennial Grasses	423	408	373	461	8.06	12.25	10.51	16.65
	Total for Grasses	567	423	399	528	9.38	12.44	11.03	17.06
F	<i>Alyssum alyssoides</i> (a)	<sub>b</sub> 216	<sub>a</sub> 145	<sub>b</sub> 234	<sub>c</sub> 357	.62	1.32	1.91	1.57
F	<i>Arabis</i> sp.	-	-	-	3	-	-	-	.03
F	<i>Astragalus</i> sp.	<sub>b</sub> 15	<sub>a</sub> -	<sub>ab</sub> 7	<sub>b</sub> 14	.11	-	.16	.05
F	<i>Chaenactis douglasii</i>	-	-	-	1	-	-	-	.00
F	<i>Cryptantha</i> sp.	1	-	-	3	.00	-	-	.00
F	<i>Eriogonum ovalifolium</i>	-	-	2	3	-	-	.00	.03
F	<i>Gilia</i> sp. (a)	-	10	-	-	-	.02	-	-
F	<i>Ranunculus testiculatus</i> (a)	<sub>a</sub> -	<sub>b</sub> 198	<sub>c</sub> 312	<sub>c</sub> 335	-	1.11	4.06	1.22
F	<i>Tragopogon dubius</i> (a)	10	-	-	-	.02	-	-	-
	Total for Annual Forbs	226	353	546	692	0.64	2.45	5.97	2.79
	Total for Perennial Forbs	16	0	9	24	0.11	0	0.16	0.13
	Total for Forbs	242	353	555	716	0.75	2.45	6.14	2.92

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 2

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia nova</i>	1.70	1.04	.86	1.41	1.50	1.08	1.58
B	<i>Artemisia tridentata vaseyana</i>	-	.12	-	.03	-	-	-
B	<i>Chrysothamnus nauseosus</i>	-	-	-	.00	-	-	-
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	2.12	1.97	2.45	4.61	4.54	3.83	7.96
B	<i>Gutierrezia sarothrae</i>	-	-	-	-	-	-	.01
B	<i>Juniperus osteosperma</i>	1.83	2.27	1.94	2.33	1.81	1.98	2.01
B	<i>Pinus edulis</i>	.03	.15	-	-	-	-	-
	Total for Browse	5.70	5.55	5.26	8.38	7.85	6.89	11.56

#### POINT-QUARTER TREE DATA--

Management unit 25A, Study no: 2

Species	Trees per Acre				Average diameter (in)			
	'99	'04	'09	'13	'99	'04	'09	'13
<i>Juniperus osteosperma</i>	72	-	35	39	2.3	-	4.7	2.5
<i>Pinus edulis</i>	23	-	20	20	1.7	-	3.5	3.5

**BASIC COVER--**

Management unit 25A, Study no: 2

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	18.36	19.96	22.52	31.09
Rock	4.71	4.80	5.59	5.32
Pavement	11.60	31.67	16.30	11.88
Litter	21.79	29.78	34.37	32.16
Cryptogams	.05	1.04	.98	1.66
Bare Ground	29.98	26.72	27.22	26.30

**PELLET GROUP DATA--**

Management unit 25A, Study no: 2

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	18	56	42	12	-	-	-	-
Elk	15	16	8	14	38 (93)	20 (50)	15 (36)	28 (71)
Deer	24	39	37	19	78 (192)	52 (127)	44 (107)	21 (52)
Cattle	16	6	16	11	24 (59)	12 (30)	36 (90)	39 (96)

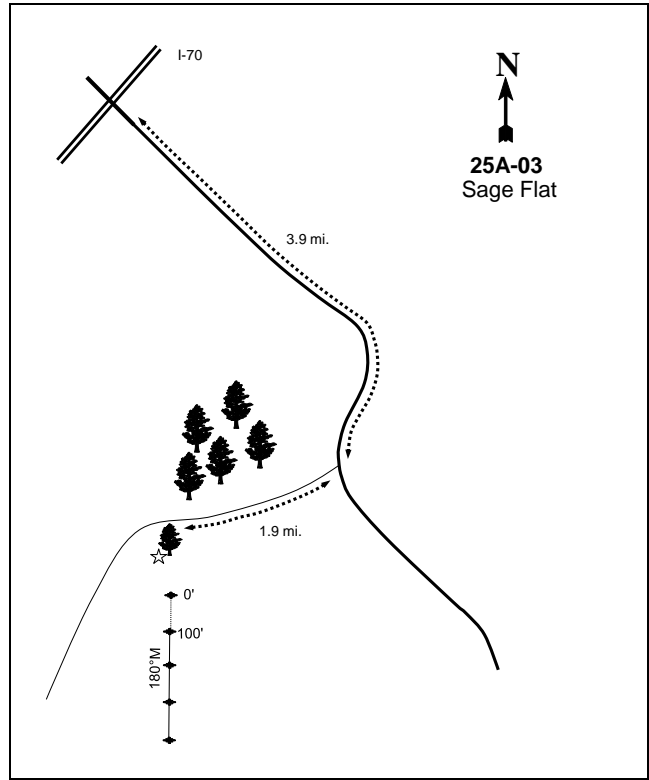
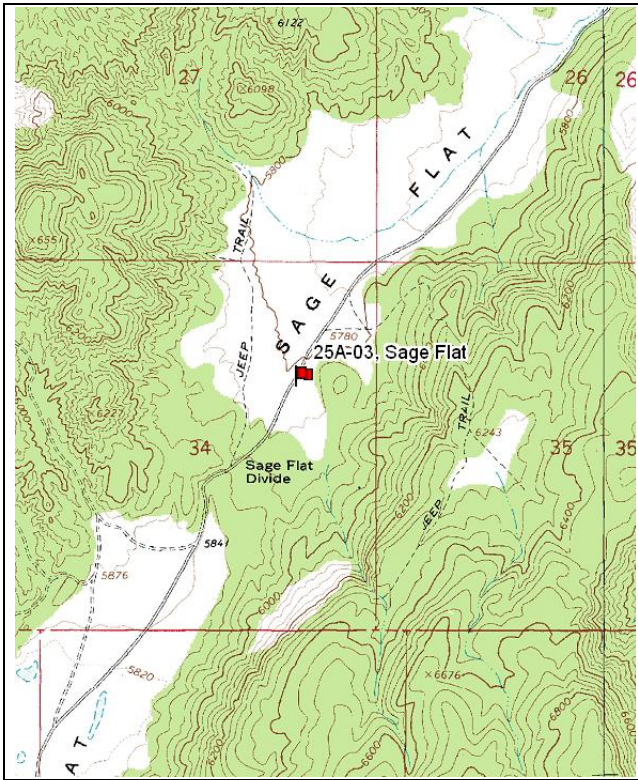
**BROWSE CHARACTERISTICS--**

Management unit 25A, Study no: 2

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia nova</b>									
99	<b>860</b>	21	74	5	20	40	0	0	11/18
04	<b>540</b>	0	37	63	-	22	15	48	11/18
09	<b>480</b>	8	50	42	-	38	21	8	9/15
13	<b>440</b>	5	91	5	80	55	27	5	9/17
<b>Artemisia tridentata vaseyana</b>									
99	<b>40</b>	100	0	0	-	100	0	0	13/16
04	<b>40</b>	0	50	50	-	50	50	50	11/15
09	<b>0</b>	0	0	0	-	0	0	0	19/44
13	<b>100</b>	0	80	20	-	20	20	20	16/25
<b>Chrysothamnus depressus</b>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	5/9
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus nauseosus</b>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	13/15
13	<b>20</b>	100	0	-	-	0	0	0	21/25

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>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	2200	25	73	3	40	20	16	16	14/22
04	1400	0	96	4	-	0	6	3	13/23
09	4600	42	57	1	40	16	13	.86	9/15
13	4720	24	72	4	520	24	.42	5	11/24
<i>Gutierrezia sarothrae</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	8/11
<i>Juniperus osteosperma</i>									
99	160	75	25	-	20	0	0	0	-/-
04	80	25	75	-	-	25	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	80	50	50	-	20	0	0	0	-/-
<i>Pediocactus simpsonii</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	2/4
<i>Pinus edulis</i>									
99	20	100	0	-	-	0	0	100	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

SAGE FLAT - TREND STUDY NO. 25A-3



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Sigurd; Township 22S, Range 1W, Section 34  
NAD 83, UTM Zone 12, 422656 East 4300339 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not available  
180° magnetic  
400ft  
Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Standard

**Directions to Site**

Beginning at the point where the Lost Creek Road passes under I-70 east of Aurora, proceed southeast up the Lost Creek Road 1.2 miles to a truck crossing. Continue past the truck crossing 1.65 miles to a bridge, then 1.05 miles beyond the bridge to a road turning off to the right. Turn right here onto the Sage Flat Road. Drive along this road for 1.9 miles to a slight bend with 5 junipers on the right side. Stop the vehicle 20-30 yards beyond these trees. On the left side of the road is a lone juniper. The baseline begins 15 feet south of this tree.

**Site Information**

Land Ownership BLM  
 Allotment Gypsum  
 Elevation 5,800ft (1,768m)  
 Aspect West  
 Slope 5%  
 Sample Dates 07/09/1985, 06/26/1991, 08/12/1999, 08/24/2004, 08/19/2009, 08/14/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

VEGETATION HISTORY--

Management unit 25A, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush/Annual Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Deer presence on site has been high from 1999 to 2009, but was low in 2013 (Table - Pellet Group Data). Utilization of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) was high in 2004, but has been light in other sample years.

**Site Potential**

1981-2010 Average Annual Precipitation 11 inches  
 NRCS Taxonomical soil Classification Fine-silty, mixed, superactive, calcareous, mesic Xeric Torrfluvents  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

SOIL ANALYSIS DATA--

Management unit 25A, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	52	28.7	19.3	7.7	0.6	1.3	5.8	147.2	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1985, the site was dominated by Wyoming big sagebrush and some perennial native grasses (Appendix B -Pre-1992 Data). Over the sample years perennial grasses have decreased while cheatgrass (*Bromus tectorum*) has increased. In addition, average cover for Wyoming big sagebrush has steadily decreased between 1999 to 2009, but had a sharp increase in cover in 2013 (Table - Herbaceous Trends). The resilience of this sagebrush community may be at risk due to the high presences of cheatgrass on this site (USDA-NRCS, 2011). Although adjacent to a Utah juniper (*Juniperus osteosperma*) woodland the site has seen little to no woody encroachment.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25A, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	18.6	5.7	5.5	0.4	-11.3	0.0	0.0	<b>19.0</b>	Poor
2004	16.8	3.6	1.5	0.0	-20.0	0.0	0.0	<b>1.9</b>	Very Poor
2004	11.1	-0.3	0.0	0.0	-20.0	0.0	0.0	<b>-9.2</b>	Very Poor
2013	21.1	9.3	5.0	0.2	-14.7	0.0	0.0	<b>20.9</b>	Poor

## HERBACEOUS TRENDS--

Management unit 25A, Study no: 3

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Bromus tectorum (a)	<sub>a</sub> 429	<sub>b</sub> 475	<sub>a</sub> 438	<sub>a</sub> 422	15.06	32.11	27.49	19.66
G	Sitanion hystrix	<sub>a</sub> 3	<sub>a</sub> 3	<sub>a</sub> -	<sub>b</sub> 7	.03	.03	-	.12
G	Sporobolus cryptandrus	1	-	-	-	.18	-	-	-
Total for Annual Grasses		429	475	438	422	15.06	32.11	27.49	19.66
Total for Perennial Grasses		4	3	0	7	0.21	0.02	0	0.12
Total for Grasses		433	478	438	429	15.27	32.14	27.49	19.78
F	Alyssum alyssoides (a)	<sub>a</sub> 28	<sub>a</sub> 25	<sub>b</sub> 127	<sub>c</sub> 254	.17	.14	1.45	1.50
F	Erodium cicutarium (a)	<sub>a</sub> -	<sub>b</sub> 40	<sub>c</sub> 79	<sub>c</sub> 105	-	.63	2.19	3.61
F	Lactuca serriola (a)	-	-	-	1	-	-	-	.00
F	Lappula occidentalis (a)	-	-	-	3	-	-	-	.00
F	Ranunculus testiculatus (a)	<sub>a</sub> 160	<sub>c</sub> 328	<sub>c</sub> 336	<sub>b</sub> 224	.88	3.13	8.02	2.03
F	Salsola iberica (a)	-	5	-	-	-	.00	-	-
F	Sisymbrium altissimum (a)	20	8	31	15	1.20	.07	.43	.38
Total for Annual Forbs		208	406	573	602	2.26	3.99	12.10	7.53
Total for Perennial Forbs		0	0	0	0	0	0	0	0
Total for Forbs		208	406	573	602	2.26	3.99	12.10	7.53

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

## BROWSE TRENDS--

Management unit 25A, Study no: 3

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia tridentata wyomingensis	14.90	13.40	8.88	16.89	19.66	10.70	23.40
B	Opuntia sp.	-	.03	.15	.15	.10	.13	.18
Total for Browse		14.90	13.42	9.03	17.03	19.76	10.83	23.58



**BASIC COVER--**

Management unit 25A, Study no: 3

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	30.59	49.87	45.70	42.97
Rock	1.33	1.52	1.22	2.45
Pavement	10.25	11.38	4.91	5.70
Litter	37.05	48.76	42.95	52.15
Cryptogams	.09	.87	.03	.01
Bare Ground	20.09	12.67	16.25	9.82

**PELLET GROUP DATA--**

Management unit 25A, Study no: 3

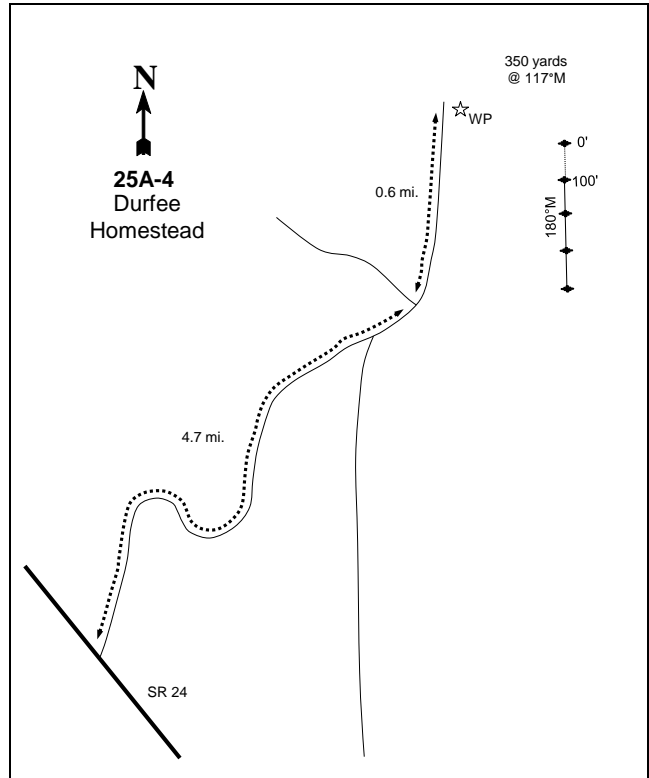
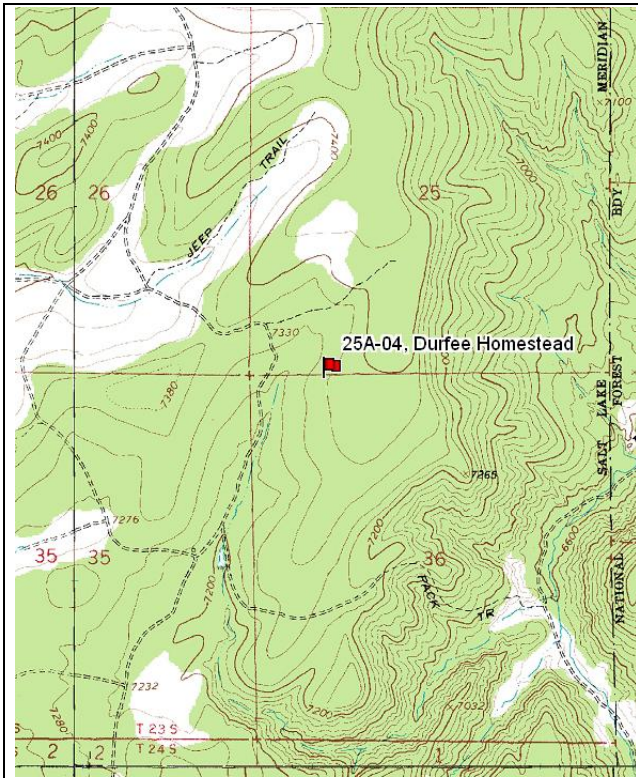
Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	35	36	60	11	-	-	-	-
Elk	-	1	2	-	4 (9)	1 (2)	-	-
Deer	53	82	69	42	125 (308)	246 (608)	191 (473)	12 (29)
Cattle	2	2	1	4	6 (14)	4 (9)	7 (18)	4 (10)

**BROWSE CHARACTERISTICS--**

Management unit 25A, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia tridentata wyomingensis</b>									
99	<b>3500</b>	11	58	31	20	26	3	1	26/34
04	<b>3200</b>	3	59	38	-	18	74	26	22/31
09	<b>2440</b>	0	49	51	-	33	4	27	23/28
13	<b>2240</b>	10	71	19	-	11	.89	14	24/41
<b>Opuntia sp.</b>									
99	<b>20</b>	0	100	-	-	0	0	0	-/-
04	<b>20</b>	0	100	-	-	0	0	0	4/9
09	<b>20</b>	0	100	-	-	0	0	0	4/16
13	<b>20</b>	0	100	-	-	0	0	0	9/24

DURFEE HOMESTEAD - TREND STUDY NO. 25A-4



**Location Information**

USGS 7.5 min Map Info      Rex Reservoir; Township 23S, Range 1W, Section 36  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 425009 East 4291072 North

**Transect Information**

Browse Tag # (0' Stake)      7194  
 Transect Bearing              180° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

Drive east on SR 24 from Sigurd to mile marker 21. Turn left (north) on the Sand Ledge Road and drive northeast for 1.6 miles. Turn left at the intersection and proceed north 3.1 miles to an intersection with a trough and pond. Continue 0.1 miles to a road that goes up the draw bottom. Drive up this road for 0.5 miles. Stop at the witness post (1/2" red rebar 2' tall on east side of road) and walk out 350 yards at a bearing of 17 degrees magnetic. The baseline starts out in the chaining about 100 feet from the edge of the PJ. The 0-foot baseline stake has a red browse tag #7194 attached.

**Site Information**

Land Ownership SITLA  
 Allotment Gypsum  
 Elevation 7,400ft (2,256m)  
 Aspect West  
 Slope 10%  
 Sample Dates 07/06/1985, 06/27/1991, 08/16/1999, 08/12/2004, 08/19/2009, 08/14/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 4

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1983	-
Seeding	-	-	1983	-
Wildfire	-	-	1985-1991	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985	Wyoming Big Sagebrush	Phase I
1991	Perennial Grass	Phase I
1999-2013	Perennial Grass/Low Rabbitbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

There has been a low abundance of pellet groups throughout the sample years.

**Site Potential**

1981-2010 Average Annual Precipitation 18 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed, superactive, mesic Petrocalcic Palexerolls  
 NRCS Ecological Site Mountain gravelly loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB406UT

**SOIL ANALYSIS DATA--**

Management unit 25A, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	34	38.7	27.3	7.5	0.7	4.3	38.1	214.4	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Gravelly Loam \(Mountain Big Sagebrush\), R047XA406UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1985, the site consisted of a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with a diverse component of other shrub species present that provided little cover. The herbaceous understory consisted of a mixture of intentionally introduced perennial and native grass species, while forbs were sparse on the site (Appendix B -Pre-1992 Data). Prior to the establishment of the study site

and the chaining treatment, pinyon and juniper were likely a major component of the study site, but since the chaining treatment and fire, pinyon and juniper have been slow to establish on the site (Table - Browse Characteristics). Areas adjacent to the site are dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). A fire occurred following the sampling in 1985 with repeat photographs showing that much of the preferred browse component was detrimentally affected. The site has remained in a stable state with a mixture of introduced perennial and native grass species being the major component of the study site. Cheatgrass (*Bromus tectorum*) has fluctuated on the site and has remained a minor component of the site, but poses a risk to the resilience of the community. Shrub species have increased on the site but have remained a minor component, with the exception of low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), on the site (Table - Browse Trends, Table - Herbaceous Trends). Without disturbance it is predicted that preferred shrub species may continue to increase in abundance on site and eventually transition to a sagebrush dominated state (USDA-NRCS, 2011).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 25A, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	3.3	0.0	0.0	17.1	-0.7	5.5	0.0	<b>25.1</b>	Poor-Fair
2004	4.7	0.0	0.0	19.2	-1.9	5.3	0.0	<b>27.3</b>	Fair
2009	6.4	14.8	0.0	23.8	-0.7	5.5	0.0	<b>49.7</b>	Good
2013	6.9	15.0	2.2	30.0	-0.1	4.2	0.0	<b>58.2</b>	Good

#### HERBACEOUS TRENDS--

Management unit 25A, Study no: 4

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	4	9	16	3	.03	.06	.27	.00
G	Agropyron intermedium	21	15	21	42	.43	.60	.43	.82
G	Agropyron spicatum	144	139	121	130	3.56	5.56	4.16	4.22
G	Bromus inermis	a91	a92	a122	b161	2.66	2.41	4.36	7.78
G	Bromus tectorum (a)	b126	b110	a58	a30	.90	2.57	.98	.18
G	Carex sp.	ab2	a-	ab4	b8	.03	-	.06	.36
G	Oryzopsis hymenoides	-	-	-	2	.00	-	-	.00
G	Poa fendleriana	ab34	a16	b40	b35	.28	.46	1.66	.88
G	Poa secunda	b89	a40	b74	b110	1.32	.40	.87	1.79
G	Sitanion hystrix	b27	a10	a11	a3	.20	.09	.07	.06
Total for Annual Grasses		126	110	58	30	0.90	2.57	0.98	0.18
Total for Perennial Grasses		412	321	409	494	8.53	9.61	11.90	15.92
Total for Grasses		538	431	467	524	9.44	12.18	12.88	16.11
F	Agoseris glauca	b18	a4	a2	a2	.17	.01	.15	.00
F	Allium sp.	-	-	-	3	-	-	-	.00
F	Alyssum alyssoides (a)	a-	a-	b65	b62	-	-	.46	.16
F	Arabis sp.	ab3	ab4	a-	b15	.01	.01	-	.03
F	Astragalus beckwithii	3	4	-	3	.00	.03	-	.00

T y p e	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	Astragalus purshii	-	-	-	3	-	-	-	.03
F	Chaenactis douglasii	b11	a-	a-	a-	.03	-	-	-
F	Cirsium sp.	b44	ab42	a22	ab38	1.23	1.28	.59	.57
F	Collinsia parviflora (a)	a10	c200	b81	b65	.01	.52	.36	.13
F	Collomia linearis (a)	a1	b59	a3	a-	.00	.17	.00	-
F	Comandra pallida	1	-	1	1	.00	-	.00	.00
F	Crepis acuminata	a-	ab2	b13	a1	-	.00	.10	.03
F	Cymopterus longipes	-	-	-	3	-	-	-	.00
F	Draba sp. (a)	6	3	-	10	.04	.00	-	.01
F	Epilobium brachycarpum (a)	b41	a5	a-	a2	.13	.01	-	.00
F	Erigeron eatonii	6	2	-	4	.04	.01	-	.01
F	Erigeron pumilus	b22	a5	a1	a6	.42	.04	.00	.01
F	Eriogonum racemosum	6	6	7	13	.04	.23	.11	.28
F	Eriogonum umbellatum	4	2	1	4	.01	.03	.06	.01
F	Gayophytum ramosissimum(a)	ab22	b26	a-	a5	.17	.10	-	.01
F	Lactuca serriola (a)	-	-	-	1	-	-	-	.00
F	Lepidium sp. (a)	-	7	-	2	-	.02	-	.03
F	Machaeranthera canescens	b17	a4	a1	a2	.12	.03	.00	.00
F	Medicago sativa	-	-	-	-	-	-	.03	-
F	Microsteris gracilis (a)	b24	c70	c84	a-	.06	.16	.44	-
F	Petradoria pumila	6	19	17	20	.60	.84	1.00	1.04
F	Phlox longifolia	a3	b29	b30	ab19	.00	.12	.48	.04
F	Polygonum douglasii (a)	a8	b34	ab24	ab20	.02	.09	.21	.04
F	Ranunculus testiculatus (a)	a8	b73	c208	b66	.01	.16	1.66	.31
F	Sphaeralcea coccinea	3	-	5	-	.03	-	.15	-
F	Tragopogon dubius (a)	b63	a-	a1	a-	.67	.00	.03	-
F	Zigadenus paniculatus	-	-	2	2	-	-	.03	.00
Total for Annual Forbs		183	477	466	233	1.14	1.26	3.18	0.72
Total for Perennial Forbs		147	123	102	139	2.73	2.66	2.73	2.10
Total for Forbs		330	600	568	372	3.87	3.92	5.92	2.82

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 4

T y p e	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Amelanchier utahensis	.00	.03	-	.03	.08	.10	.16
B	Artemisia tridentata wyomingensis	.15	.38	.30	.68	.91	1.15	.98
B	Chrysothamnus depressus	.03	.30	.33	-	.28	-	-
B	Chrysothamnus nauseosus hololeucus	.18	.03	.03	-	.11	.20	.33
B	Chrysothamnus viscidiflorus	6.44	5.06	4.54	4.53	6.89	7.13	5.91

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
	viscidiflorus							
B	Eriogonum microthecum	-	-	.06	.21	-	-	.23
B	Gutierrezia sarothrae	1.37	2.36	.12	.17	5.85	.16	.56
B	Juniperus osteosperma	-	-	-	.01	1.00	-	1.41
B	Purshia tridentata	.30	.38	.63	1.01	.60	1.63	1.93
B	Quercus gambelii	2.04	2.24	3.65	2.95	2.48	4.83	4.91
B	Sambucus cerulea	.38	.63	.63	.85	.36	.45	.70
B	Tetradymia canescens	.03	-	.03	.33	-	.06	.23
Total for Browse		10.92	11.43	10.33	10.78	18.56	15.71	17.35

BASIC COVER--

Management unit 25A, Study no: 4

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	23.78	27.43	32.20	29.74
Rock	22.91	29.98	22.77	34.43
Pavement	15.65	29.29	29.80	16.24
Litter	18.27	14.93	24.03	26.16
Cryptogams	.01	.00	.39	.03
Bare Ground	19.98	8.79	12.98	9.26

PELLET GROUP DATA--

Management unit 25A, Study no: 4

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Sheep	-	-	-	-	-	-	1 (2)	-
Rabbit	8	56	13	12	-	-	-	-
Elk	9	7	7	4	33 (82)	7 (17)	9 (22)	3 (8)
Deer	7	11	10	8	15 (38)	15 (36)	13 (31)	7 (18)
Cattle	9	1	2	2	16 (40)	4 (9)	11 (27)	-

BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 4

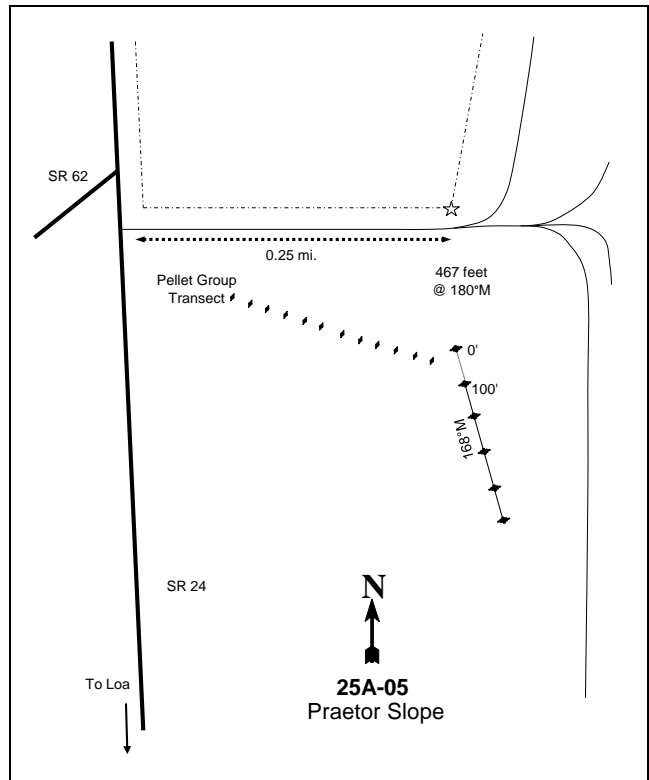
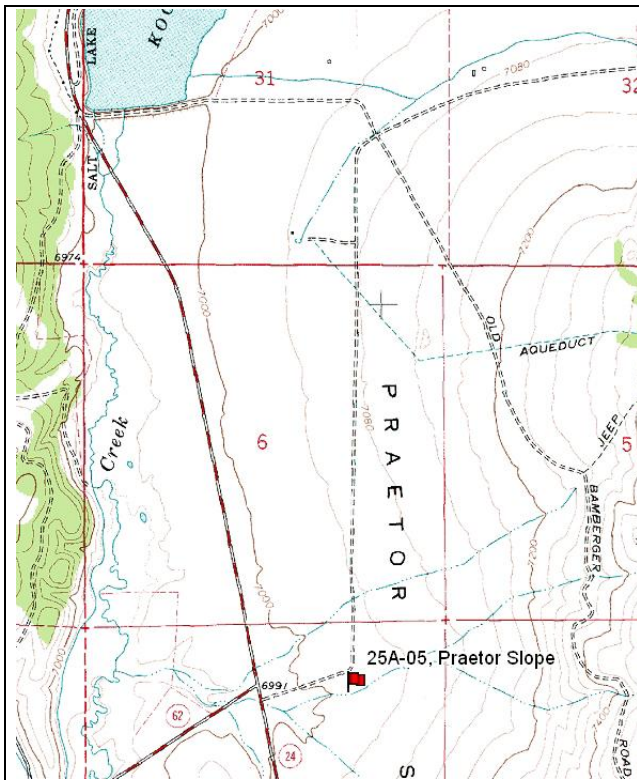
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Amelanchier utahensis									
99	0	0	0	-	20	0	0	0	20/28
04	20	0	100	-	-	0	100	0	14/17
09	20	0	100	-	-	0	0	0	21/25
13	20	100	0	-	-	100	0	0	-/-

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>									
99	20	0	100	0	-	0	0	0	35/53
04	100	20	80	0	-	40	0	0	16/22
09	140	0	86	14	-	0	0	14	19/23
13	180	0	100	0	-	44	0	0	18/27
<i>Atriplex canescens</i>									
99	0	0	0	-	-	0	0	0	19/27
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus depressus</i>									
99	140	0	100	0	-	29	0	0	5/7
04	260	0	77	23	-	31	69	8	5/8
09	280	0	100	0	-	0	0	0	4/10
13	20	0	100	0	-	0	0	100	3/6
<i>Chrysothamnus nauseosus hololeucus</i>									
99	60	0	100	-	-	0	0	0	22/32
04	40	0	100	-	20	0	100	0	21/28
09	20	0	100	-	-	0	0	0	20/29
13	20	0	100	-	-	0	0	0	20/22
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	3660	5	78	17	-	1	0	8	15/22
04	4660	5	74	21	-	3	4	41	13/24
09	3640	8	89	3	100	0	0	3	13/21
13	3140	25	67	8	20	2	0	12	13/22
<i>Eriogonum microthecum</i>									
99	60	0	100	-	-	100	0	0	3/13
04	120	0	100	-	-	0	0	0	7/14
09	200	0	100	-	-	0	0	0	6/12
13	220	0	100	-	100	0	0	0	7/16
<i>Gutierrezia sarothrae</i>									
99	1700	6	94	0	20	0	1	0	8/11
04	10200	3	97	0	20	0	0	.39	9/12
09	620	3	97	0	-	0	0	0	8/6
13	640	13	88	0	60	3	0	0	8/10
<i>Juniperus osteosperma</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	80	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Purshia tridentata</i>										
99	<b>40</b>	0	100	-	-	0	100	0	20/48	
04	<b>20</b>	0	100	-	-	0	100	0	21/57	
09	<b>40</b>	0	100	-	-	0	0	0	23/77	
13	<b>80</b>	25	75	-	-	50	25	50	32/80	
<i>Quercus gambelii</i>										
99	<b>260</b>	0	100	-	-	0	0	0	69/69	
04	<b>600</b>	10	90	-	-	0	0	0	51/37	
09	<b>100</b>	0	100	-	-	0	0	0	67/68	
13	<b>560</b>	0	100	-	-	0	0	0	58/38	
<i>Sambucus cerulea</i>										
99	<b>20</b>	0	100	-	-	0	0	0	43/52	
04	<b>20</b>	0	100	-	-	0	100	0	55/57	
09	<b>60</b>	33	67	-	-	0	0	0	38/43	
13	<b>180</b>	33	67	-	-	0	0	0	49/20	
<i>Tetradymia canescens</i>										
99	<b>100</b>	0	100	0	-	20	0	0	6/14	
04	<b>40</b>	0	100	0	-	50	0	0	10/20	
09	<b>80</b>	0	50	50	-	25	0	50	10/27	
13	<b>340</b>	6	88	6	-	41	24	53	9/19	



PRAETOR SLOPE - TREND STUDY NO. 25A-5



**Location Information**

USGS 7.5 min Map Info Burrville; Township 26S, Range 1E, Section 7  
 GPS (0' Stake) NAD 83, UTM Zone 12, 427257 East 4268970 North

**Transect Information**

Browse Tag # (0' Stake) 55  
 Transect Bearing 168° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the junction of SR-62 and SR-24 south of Koosharem Reservoir, proceed south for 25 yards and turn left onto a dirt road. Go through the gate and up the road 0.25 miles to where the road turns at the fence corner. Walk 467 feet due south from the fence corner to the top of a small rise. The baseline starts here, and is marked by a 5' steel fence post with a blue browse tag #55.

**Site Information**

Land Ownership BLM  
 Allotment Fishlake  
 Elevation 7,000ft (2,134m)  
 Aspect West  
 Slope 2-5%  
 Sample Dates 07/07/1985, 06/29/1991, 08/23/1999, 08/10/2004, 08/19/2009, 08/14/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 5

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1964	1400
Seeding	-	-	1964	1400
Harrow (2-Way Dixie)	-	-	2002	3000
Seeding	-	-	2002	3000

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 5

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-1999	Wyoming Big Sagebrush	No Encroachment
2004-2013	Perennial Grass	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Elk presence was low on most sample years except in 2009 when it was relatively high. Utilization of Wyoming big sagebrush (*Artemisia tridentate* ssp. *wyomingensis*) has been low except in 1999.

**Site Potential**

1981-2010 Average Annual Precipitation 11 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, superactive, frigid Calcic Pachic Argixerolls  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

**SOIL ANALYSIS DATA--**

Management unit 25A, Study no: 5

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	36	39.1	24.9	7.6	0.9	1.7	14.7	361.6	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1985, the site was a stand of Wyoming big sagebrush and crested wheatgrass (*Agropyron cristatum*) (Appendix B -Pre-1992 Data). The sagebrush component was removed in 2002 following the

harrow treatment. The site transitioned to an introduced perennial grass state with crested wheatgrass being the dominant species on the site. Diversity of the herbaceous understory has remained limited (Table - Herbaceous Trends). Sagebrush has remained a minor component of the site following the treatment, but it is predicted that without disturbance, sagebrush may likely reestablish and become the dominant component on the site (Table - Browse Trends, Table Browse Characteristics) (USDA-NRCS, 2011).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 25A, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	15.1	6.0	0.5	30.0	0.0	0.0	0.0	<b>51.6</b>	Good
2004	0.4	0.0	0.0	30.0	0.0	3.8	0.0	<b>34.2</b>	Fair
2009	1.3	0.0	0.0	30.0	0.0	0.4	0.0	<b>31.6</b>	Fair
2013	1.5	0.0	0.0	30.0	0.0	1.3	0.0	<b>32.8</b>	Fair

HERBACEOUS TRENDS--  
 Management unit 25A, Study no: 5

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	<sub>b</sub> 358	<sub>a</sub> 301	<sub>b</sub> 347	<sub>c</sub> 390	16.31	27.72	28.59	31.25
G	Agropyron intermedium	<sub>a</sub> -	<sub>ab</sub> 8	<sub>ab</sub> 3	<sub>b</sub> 11	-	.09	.03	.36
G	Agropyron smithii	-	3	-	-	-	.00	-	-
G	Festuca ovina	-	-	-	9	-	-	-	.24
G	Poa secunda	<sub>a</sub> -	<sub>a</sub> 2	<sub>b</sub> 13	<sub>ab</sub> 6	-	.00	.33	.04
G	Stipa lettermani	1	-	1	3	.00	-	.00	.15
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		359	314	364	419	16.32	27.82	28.95	32.06
Total for Grasses		359	314	364	419	16.32	27.82	28.95	32.06
F	Amaranthus sp.	-	-	-	4	-	-	-	.03
F	Antennaria sp.	-	-	4	2	-	-	.00	.00
F	Arabis sp.	-	-	-	2	-	-	-	.00
F	Astragalus calycosus	-	-	-	3	-	-	-	.01
F	Astragalus miser	-	8	-	-	-	.09	-	-
F	Chenopodium fremontii (a)	-	3	-	3	-	.00	-	.01
F	Draba sp. (a)	-	-	-	3	-	-	-	.00
F	Erigeron sp.	-	-	1	-	-	-	.03	-
F	Gayophytum ramosissimum(a)	<sub>a</sub> -	<sub>b</sub> 12	<sub>a</sub> -	<sub>a</sub> -	-	.07	-	-
F	Linum lewisii	<sub>a</sub> -	<sub>b</sub> 70	<sub>a</sub> -	<sub>a</sub> -	-	1.44	-	-
F	Microsteris gracilis (a)	-	7	-	-	-	.01	-	-
F	Penstemon sp.	-	1	-	-	-	.03	-	-
F	Phlox hoodii	-	-	2	-	-	-	.00	-
F	Phlox longifolia	<sub>a</sub> -	<sub>b</sub> 16	<sub>ab</sub> 1	<sub>c</sub> 56	-	.06	.03	.32
F	Ranunculus testiculatus (a)	<sub>a</sub> 31	<sub>b</sub> 203	<sub>c</sub> 323	<sub>a</sub> 12	.15	2.08	3.87	.02
F	Sanguisorba minor	-	2	-	-	-	.00	-	-

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	<i>Sphaeralcea grossulariifolia</i>	a-	b18	b13	b21	-	.27	.11	.27
Total for Annual Forbs		31	225	323	18	0.15	2.17	3.87	0.03
Total for Perennial Forbs		0	115	21	88	0	1.90	0.18	0.64
Total for Forbs		31	340	344	106	0.15	4.08	4.05	0.68

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 5

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia tridentata wyomingensis</i>	12.08	.31	1.00	1.18	.33	.63	3.10
B	<i>Leptodactylon pungens</i>	-	-	-	.00	.13	-	-
B	<i>Opuntia sp.</i>	-	-	-	.00	-	-	-
Total for Browse		12.08	0.31	1.00	1.19	0.46	0.63	3.10

#### BASIC COVER--

Management unit 25A, Study no: 5

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	25.32	31.67	32.41	35.40
Rock	12.27	19.76	10.42	26.72
Pavement	29.80	16.15	30.94	11.03
Litter	21.66	25.97	25.81	21.71
Cryptogams	1.10	0	0	0
Bare Ground	11.23	20.52	10.86	18.11

#### PELLET GROUP DATA--

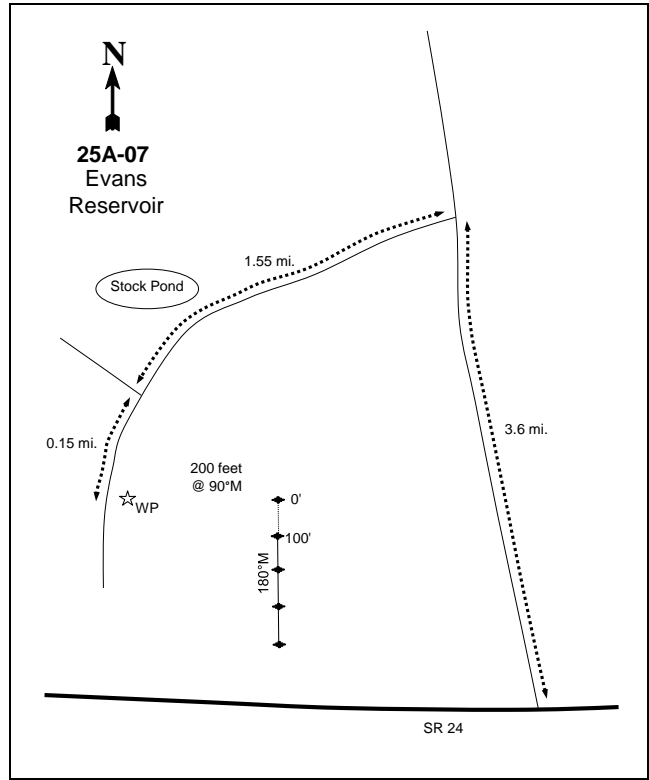
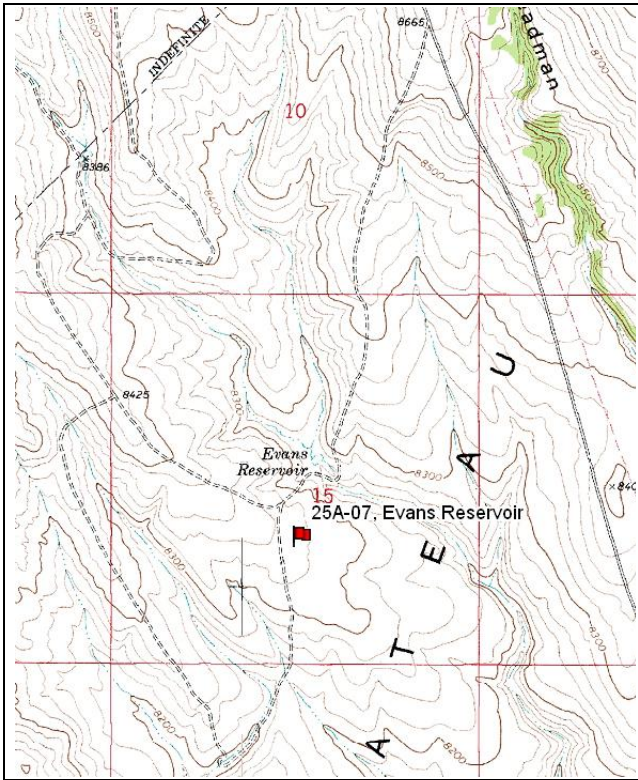
Management unit 25A, Study no: 5

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Sheep	8	-	-	-	22 (56)	-	-	-
Rabbit	66	45	34	23	-	-	-	-
Elk	1	2	24	5	1 (2)	4 (10)	73 (180)	-
Deer	12	1	15	5	12 (30)	-	2 (5)	-
Cattle	1	-	2	17	-	-	4 (9)	5 (14)

BROWSE CHARACTERISTICS--  
Management unit 25A, Study no: 5

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
99	<b>4420</b>	1	68	30	-	62	23	11	21/28	
04	<b>380</b>	11	53	37	20	0	16	37	13/16	
09	<b>500</b>	4	92	4	-	0	0	0	17/17	
13	<b>2160</b>	63	37	0	2880	21	.92	0	17/26	
<i>Atriplex canescens</i>										
99	<b>0</b>	0	0	-	-	0	0	0	9/12	
04	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus nauseosus</i>										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	28/31	
13	<b>20</b>	100	0	-	-	0	0	0	24/47	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	11/8	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>20</b>	0	100	-	-	0	0	0	5/7	
09	<b>60</b>	0	100	-	-	0	0	0	6/9	
13	<b>20</b>	100	0	-	-	0	0	0	9/11	
<i>Opuntia sp.</i>										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	-	0	0	0	2/4	
<i>Tetradymia canescens</i>										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	15/9	

EVANS RESERVOIR - TREND STUDY NO. 25A-7



**Location Information**

USGS 7.5 min Map Info Abes Knoll; Township 27S, Range 1E, Section 15  
 GPS (0' Stake) NAD 83, UTM Zone 12, 431095 East 4257135 North

**Transect Information**

Browse Tag # (0' Stake) 7122  
 Transect Bearing 180° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Heading northwest out of Loa on SR 24, turn right at mile marker 45. Go 3.5 miles to a green and yellow fence post on the left (20 feet off the road). Continue about 0.1 miles past the fence post and turn left. Go 1.55 miles past a stock pond and up to a fork. Turn left at the fork and go 0.15 miles to a steel rebar witness post on the left side of the road. From the witness post, walk 200 feet east to the 0-foot baseline stake, a rebar with browse tag #7122.

**Site Information**

Land Ownership BLM  
 Allotment Fishlake  
 Elevation 8,300ft (2,530m)  
 Aspect North  
 Slope 2-5  
 Sample Dates 09/14/1985, 06/04/1991, 08/11/1999, 08/10/2004, 08/18/2009, 08/19/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 7

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Harrow (2-Way Dixie)	-	-	Fall 1999	-
Seeding	-	-	Fall 1999	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Crucial Year-Long; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 7

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Mountain Big Sagebrush/Black Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A stock pond is located a quarter of a mile north of the study site. Both deer and pronghorn use the area and sage-grouse have been seen in the area.

**Site Potential**

1981-2010 Average Annual Precipitation 20 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

**SOIL ANALYSIS DATA--**

Management unit 25A, Study no: 7

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	59.3	21.4	19.3	7.1	1.2	1.7	8.8	217.6	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1985, the site was a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and black sagebrush (*Artemisia nova*) with a diverse component of other shrub species which were limited in abundance. Various native perennial grass and forb species made up the herbaceous understory. Native perennial grasses have increased since treatment in 1999, while shrubs and forbs have varied between

years. The shrub component decreased on the site following the treatment in 1999, but shrubs have since increased in abundance on the site (Table - Browse Trends, Table - Browse Characteristics). It is predicted that without disturbance sagebrush may continue to increase in cover and remain the dominant component of the site (USDA-NRCS, 2011).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25A, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	20.9	0.4	4.2	26.0	0.0	10.0	0.0	<b>61.5</b>	Fair
2004	7.6	8.0	3.1	30.0	0.0	6.8	0.0	<b>55.5</b>	Fair
2009	7.3	7.4	4.2	30.0	0.0	5.4	0.0	<b>54.4</b>	Fair
2013	11.9	11.1	8.6	30.0	0.0	7.6	0.0	<b>69.1</b>	Good

HERBACEOUS TRENDS--  
Management unit 25A, Study no: 7

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	a-	b21	b17	b23	-	.28	.65	.71
G	Agropyron intermedium	a-	a-	b7	a-	-	.00	.21	-
G	Agropyron spicatum	140	125	126	118	4.24	6.29	5.76	6.14
G	Agropyron trachycaulum	-	3	-	3	-	.03	-	.03
G	Bouteloua gracilis	ab52	a42	ab37	b56	.65	.75	1.30	1.46
G	Carex sp.	18	21	26	30	.56	.29	.20	.44
G	Oryzopsis hymenoides	8	3	6	1	.33	.06	.06	.00
G	Poa fendleriana	a156	b198	a129	b192	4.73	8.13	4.46	7.34
G	Poa secunda	11	4	2	15	.09	.04	.03	.48
G	Sitanion hystrix	a26	a47	a41	b69	.71	1.11	.95	2.04
G	Stipa comata	5	7	7	21	.21	.24	.22	.90
G	Stipa pinetorum	b107	a49	b119	b94	1.47	1.64	4.13	4.38
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		523	520	517	622	13.02	18.90	18.00	23.94
Total for Grasses		523	520	517	622	13.02	18.90	18.00	23.94
F	Androsace septentrionalis (a)	b31	a5	a-	b32	.19	.01	-	.10
F	Arabis demissa	a3	ab7	b10	ab3	.00	.01	.06	.03
F	Astragalus convallarius	b77	a39	a27	a35	2.23	.31	.20	.29
F	Astragalus sp.	-	-	-	4	-	-	-	.01
F	Chaenactis douglasii	8	-	-	-	.02	-	-	-
F	Chenopodium leptophyllum(a)	-	-	3	3	-	-	.00	.01
F	Collinsia parviflora (a)	-	-	3	-	-	-	.03	-
F	Comandra pallida	4	2	2	7	.06	.03	.03	.04
F	Cryptantha sp.	ab17	ab20	a5	b32	.25	.16	.04	.08
F	Erigeron pumilus	5	12	4	13	.01	.13	.04	.06
F	Eriogonum alatum	2	-	3	-	.00	-	.00	-



Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	Eriogonum racemosum	1	3	2	1	.01	.06	.03	.03
F	Eriogonum umbellatum	10	4	4	6	.21	.09	.04	.07
F	Gayophytum ramosissimum(a)	a-	b19	b13	a-	-	.06	.03	-
F	Lappula occidentalis (a)	-	8	-	-	-	.02	-	-
F	Linum lewisii	b30	a1	ab15	c59	.30	.00	.06	.66
F	Lotus utahensis	ab16	ab16	a4	b24	.36	.80	.04	.21
F	Penstemon comarrhenus	a-	a1	ab2	b5	-	.03	.03	.04
F	Phlox austromontana	109	104	112	114	1.83	1.67	2.07	2.16
F	Phlox longifolia	a-	b9	ab2	b11	-	.03	.00	.03
F	Ranunculus testiculatus (a)	-	-	-	2	-	-	-	.00
F	Senecio multilobatus	6	-	6	6	.05	-	.04	.04
F	Sphaeralcea coccinea	-	-	-	3	-	-	-	.00
F	Streptanthus cordatus	-	2	-	-	-	.03	-	-
F	Tragopogon dubius (a)	-	-	2	-	-	-	.03	-
F	Trifolium sp.	5	2	3	1	.01	.01	.00	.00
Total for Annual Forbs		31	32	21	37	0.19	0.09	0.09	0.11
Total for Perennial Forbs		293	222	201	324	5.39	3.40	2.72	3.78
Total for Forbs		324	254	222	361	5.58	3.49	2.82	3.89

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 7

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia nova	6.79	2.40	2.15	3.40	3.55	3.48	3.93
B	Artemisia tridentata vaseyana	9.89	3.47	3.54	6.02	5.10	5.85	6.00
B	Chrysothamnus viscidiflorus viscidiflorus	.46	1.55	1.73	2.03	2.26	.73	1.93
B	Eriogonum corymbosum	.03	.03	-	-	-	-	-
B	Eriogonum microthecum	.06	.18	.18	.06	.16	-	.13
B	Gutierrezia sarothrae	-	.91	.29	.07	1.03	1.20	.06
B	Kochia prostrata	-	.02	-	-	-	-	-
B	Leptodactylon pungens	.09	.23	.48	.61	.25	.16	.40
Total for Browse		17.33	8.82	8.39	12.20	12.35	11.42	12.45

BASIC COVER--

Management unit 25A, Study no: 7

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	35.34	32.10	33.76	43.54
Rock	1.35	2.43	.39	.53
Pavement	25.01	31.26	14.33	26.59
Litter	25.26	31.07	35.95	49.16
Cryptogams	.08	.03	0	.00
Bare Ground	10.93	16.96	20.91	1.32

PELLET GROUP DATA--

Management unit 25A, Study no: 7

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	45	53	58	14	-	-	-	-
Grouse	2	2	-	3	26 pellets/acre	-	17 pellets/acre	-
Elk	38	14	53	42	51 (126)	25 (63)	25 (61)	16 (39)
Deer	5	18	9	12	16 (40)	15 (36)	80 (198)	4 (9)
Antelope	1	3	-	-	-	5 (12)	-	-

BROWSE CHARACTERISTICS--

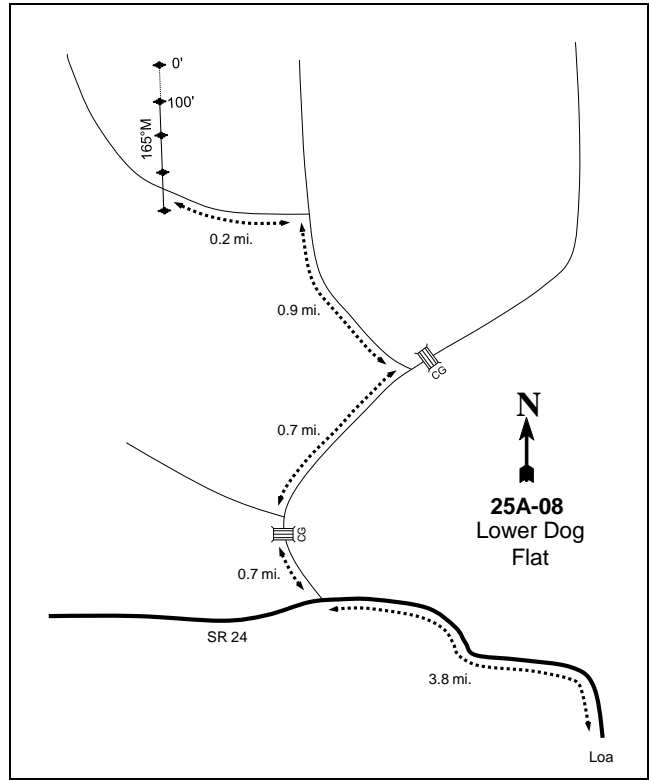
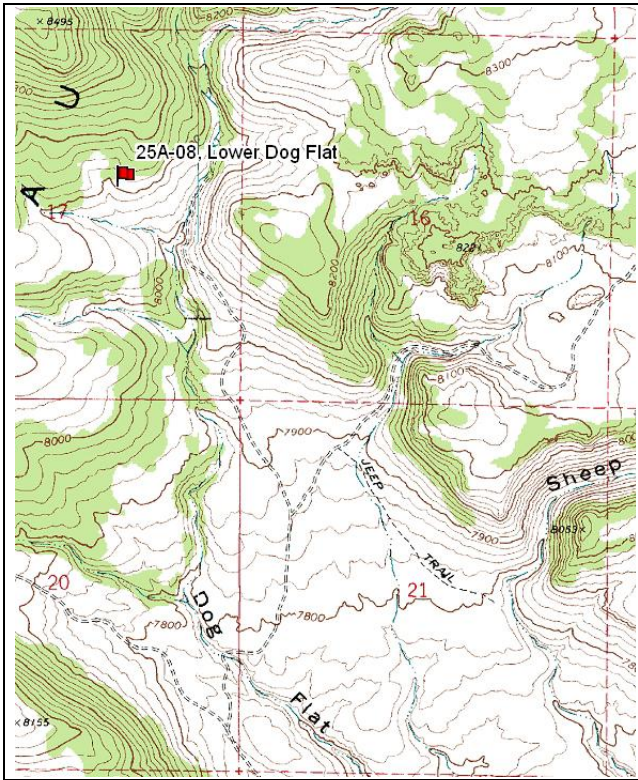
Management unit 25A, Study no: 7

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 nova</i>									
99	<b>4140</b>	6	51	43	80	44	1	24	11/19
04	<b>1820</b>	5	80	14	2180	0	0	4	8/16
09	<b>2140</b>	13	69	18	60	18	12	15	9/15
13	<b>2340</b>	25	65	10	120	49	15	13	8/17
<i>Artemisia tridentata vaseyana</i>									
99	<b>4360</b>	10	37	53	-	62	10	15	17/29
04	<b>1620</b>	7	62	31	1480	12	6	11	14/23
09	<b>1860</b>	6	62	31	20	11	20	18	14/22
13	<b>1960</b>	13	71	15	20	41	19	28	16/27
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	<b>1220</b>	8	87	5	-	0	0	0	8/10
04	<b>1540</b>	1	97	1	160	0	0	0	9/15
09	<b>1200</b>	0	95	5	-	0	0	8	7/12
13	<b>1640</b>	11	88	1	-	29	24	15	9/19

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Coryphantha vivipara</i>										
99	20	0	100	-	-	0	0	0	2/4	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Eriogonum corymbosum</i>										
99	40	50	50	-	-	0	0	0	7/6	
04	60	0	100	-	-	33	0	0	9/12	
09	20	0	100	-	-	0	0	0	8/12	
13	20	0	100	-	-	100	0	100	8/12	
<i>Eriogonum microthecum</i>										
99	80	0	100	-	-	25	0	0	4/4	
04	440	5	95	-	-	0	5	0	7/11	
09	200	0	100	-	-	0	0	0	6/9	
13	420	10	90	-	-	10	0	0	7/9	
<i>Gutierrezia sarothrae</i>										
99	20	0	100	0	-	0	0	0	3/7	
04	920	0	100	0	100	0	0	0	9/13	
09	1100	5	75	20	-	13	0	15	6/9	
13	480	29	67	4	260	4	0	4	6/8	
<i>Kochia prostrata</i>										
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	360	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	12/5	
13	0	0	0	-	-	0	0	0	5/7	
<i>Leptodactylon pungens</i>										
99	600	7	93	0	-	0	0	0	6/7	
04	820	7	88	5	-	0	0	5	6/10	
09	780	0	100	0	-	0	0	3	5/9	
13	500	4	92	4	20	8	0	56	7/13	
<i>Opuntia sp.</i>										
99	20	0	100	-	-	0	0	0	5/13	
04	0	0	0	-	-	0	0	0	6/9	
09	20	0	100	-	-	0	0	0	4/11	
13	20	0	100	-	-	0	0	0	4/6	
<i>Symphoricarpos oreophilus</i>										
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	11/27	
09	0	0	0	-	-	0	0	0	6/19	
13	0	0	0	-	-	0	0	0	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Tetradymia canescens										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>80</b>	75	25	-	-	0	0	0	4/5	
09	<b>40</b>	0	100	-	-	0	0	0	4/4	
13	<b>60</b>	33	67	-	-	67	0	0	7/10	

LOWER DOG FLAT - TREND STUDY NO. 25A-8



**Location Information**

USGS 7.5 min Map Info      Loa; Township 27S, Range 2E, Section 17  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 437801 East 4257498 North

**Transect Information**

Browse Tag # (0' Stake)      7188  
 Transect Bearing              165° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

From Loa, go 3.8 miles northwest on SR 24 (0.9 miles beyond mile marker 49). Turn right (north) on a gravel road and proceed 0.7 miles. Just beyond the cattleguard turn right and go another 0.7 miles. Turn left just before another cattleguard and go 0.9 miles. At the bottom of the hill, a road forks off to the left, through a wash, up a steep hill and west into the chaining. Take this road 0.2 miles and stop at a 3' rebar post on the right side of the road marking the 300' stake of the baseline. The 0-foot baseline stake is marked by browse tag #7188.

**Site Information**

Land Ownership BLM  
 Allotment Seven Mile  
 Elevation 8,100ft (2,469m)  
 Aspect South  
 Slope 13-15%  
 Sample Dates 09/12/1985, 06/06/1991, 08/24/1999, 08/10/2004, 08/18/2009, 08/19/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 8

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining	-	-	1980	-
Seeding	-	-	1980	-
Harrow (2-Way Dixie)	Seven Mile-North Mountain Dixie Harrow	<a href="#">594</a>	Fall 2006	6,000
Seeding (Broadcast Before)	Seven Mile-North Mountain Dixie Harrow	<a href="#">594</a>	Fall 2006	6,000

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 25A, Study no: 8

Project Name: Seven Mile - Low elevation			
WRI Database #: <a href="#">594</a>			
Application: Broadcast		Acres: 4400	
Seed type		lbs in mix	lbs/acre
G	Big Bluegrass 'Sherman'	1169	0.27
G	Crested Wheatgrass 'Ephraim'	2200	0.50
G	Crested Wheatgrass 'Hycrest'	2220	0.50
G	Great Basin Wildrye 'Trailhead'	3535	0.80
G	Pubescent Wheatgrass	2200	0.50
G	Russian Wildrye	4420	1.00
G	Sandberg Bluegrass	1094	0.25
G	Sheep Fescue	1100	0.25
F	Alfalfa 'Ladak'	2200	0.50
F	Annual Sunflower	140	0.03
F	Blue Flax	533	0.12
F	Blue Flax 'Appar	900	0.20
F	Small Burnet 'Delar'	8800	2.00
F	Yellow Sweetclover	1100	0.25
G	Big Bluegrass 'Sherman'	1169	0.27
Total Pounds		31611	7.18
PLS Pounds:		28468	6.47

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Winter Crucial; Sage-Grouse, Habitat Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 8

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Only two of the five belts occur within the harrow treatment. All the sagebrush on the site has been classified as mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) though some of the individual plants resemble black sagebrush (*A. nova*).

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

**SOIL ANALYSIS DATA--**

Management unit 25A, Study no: 8

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	43.3	29.4	27.3	7.3	0.7	2.3	6.7	201.6	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1985, the site has been in a stable state with mountain big sagebrush being the dominant component with a mixture of seeded introduced and native perennial grasses and forbs making up the herbaceous understory (Appendix B -Pre-1992 Data, Table - Herbaceous Trends, Table - Browse Trends). Two of the five transects were treated in 2006 with shrubs, forbs, and grasses experiencing a slight decrease in cover (Table - Herbaceous Trends, Table - Browse Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) encroachment is visually evident following the 1980 chaining.

**Trend Summary**

**DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --**

Management unit 25A, study no: 8

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	22.2	10.5	6.0	17.4	0.0	0.5	0.0	<b>56.6</b>	Fair
2004	23.1	8.7	1.5	15.7	0.0	0.1	0.0	<b>49.1</b>	Poor-Fair
2009	19.7	9.6	1.0	8.8	0.0	0.0	0.0	<b>39.1</b>	Poor
2013	24.4	12.6	15.0	11.6	0.0	0.1	0.0	<b>63.6</b>	Fair-Good

**HERBACEOUS TRENDS--**

Management unit 25A, Study no: 8

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	b16	a-	a-	a-	.07	-	-	-
G	Agropyron intermedium	2	-	-	-	.00	-	-	-
G	Bouteloua gracilis	c248	bc216	a178	ab191	7.15	7.20	4.01	4.51
G	Bromus inermis	b13	a-	a-	a-	.13	-	-	-

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	<i>Elymus junceus</i>	a-	a-	a-	b14	-	-	-	.72
G	<i>Koeleria cristata</i>	4	-	5	2	.03	-	.09	.03
G	<i>Oryzopsis hymenoides</i>	-	4	2	4	-	.03	.06	.04
G	<i>Poa fendleriana</i>	4	-	-	-	.00	-	-	-
G	<i>Sitanion hystrix</i>	b151	a50	a46	a36	1.28	.61	.25	.45
G	<i>Sporobolus cryptandrus</i>	-	-	-	3	-	-	-	.03
G	<i>Stipa comata</i>	3	-	-	-	.03	-	-	-
G	<i>Stipa pinetorum</i>	3	-	-	-	.00	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		444	270	231	250	8.71	7.85	4.41	5.79
Total for Grasses		444	270	231	250	8.71	7.85	4.41	5.79
F	<i>Androsace septentrionalis</i> (a)	b29	b17	a3	a-	.14	.04	.00	-
F	<i>Antennaria</i> sp.	-	3	-	-	-	.00	-	-
F	<i>Arabis demissa</i>	3	2	-	4	.00	.00	-	.01
F	<i>Astragalus</i> sp.	-	5	-	-	-	.00	-	-
F	<i>Chenopodium</i> sp. (a)	-	4	-	-	-	.01	-	-
F	<i>Cryptantha</i> sp.	-	5	-	3	-	.01	-	.00
F	<i>Descurainia pinnata</i> (a)	6	6	-	-	.01	.01	-	-
F	<i>Erigeron pumilus</i>	b41	a5	a5	a10	.21	.01	.02	.02
F	<i>Eriogonum ovalifolium</i>	3	4	-	-	.03	.00	-	-
F	<i>Phlox longifolia</i>	4	3	2	-	.01	.01	.00	-
F	<i>Salsola iberica</i> (a)	-	-	3	-	-	-	.01	-
Total for Annual Forbs		35	27	6	0	0.15	0.06	0.01	0
Total for Perennial Forbs		51	27	7	17	0.26	0.05	0.02	0.04
Total for Forbs		86	54	13	17	0.41	0.12	0.04	0.04

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 8

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia frigida</i>	-	-	.00	-	-	-	-
B	<i>Artemisia tridentata vaseyana</i>	17.73	18.48	15.73	19.51	21.50	15.80	20.91
B	<i>Gutierrezia sarothrae</i>	1.20	2.07	.17	.55	1.70	.40	.25
B	<i>Opuntia</i> sp.	-	-	.00	.03	-	-	.03
B	<i>Pediocactus simpsonii</i>	-	.03	.00	-	-	-	-
B	<i>Pinus edulis</i>	-	-	.03	.03	-	-	-
Total for Browse		18.93	20.59	15.95	20.12	23.2	16.2	21.19



POINT-QUARTER TREE DATA--

Management unit 25A, Study no: 8

Species	Trees per Acre			
	'99	'04	'09	'13
Juniperus scopulorum	6	<18	<18	-
Pinus edulis	7	25	22	29

Average diameter (in)			
'99	'04	'09	'13
3.3	-	-	-
2.5	1.9	2.7	1.4

BASIC COVER--

Management unit 25A, Study no: 8

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	27.16	27.31	20.89	27.43
Rock	24.86	24.52	20.85	21.69
Pavement	24.32	22.38	15.73	16.35
Litter	20.95	22.15	23.79	20.54
Cryptogams	.08	.24	.03	.04
Bare Ground	13.15	20.08	21.82	18.24

PELLET GROUP DATA--

Management unit 25A, Study no: 8

Type	Quadrat Frequency			
	'99	'04	'09	'13
Rabbit	26	43	56	19
Elk	3	1	2	3
Deer	10	13	9	23
Cattle	4	1	2	-

Days use per acre (ha)			
'99	'04	'09	'13
-	-	-	-
1 (3)	2 (5)	7 (18)	-
17 (43)	21 (53)	61 (150)	9 (23)
8 (20)	5 (13)	5 (13)	-

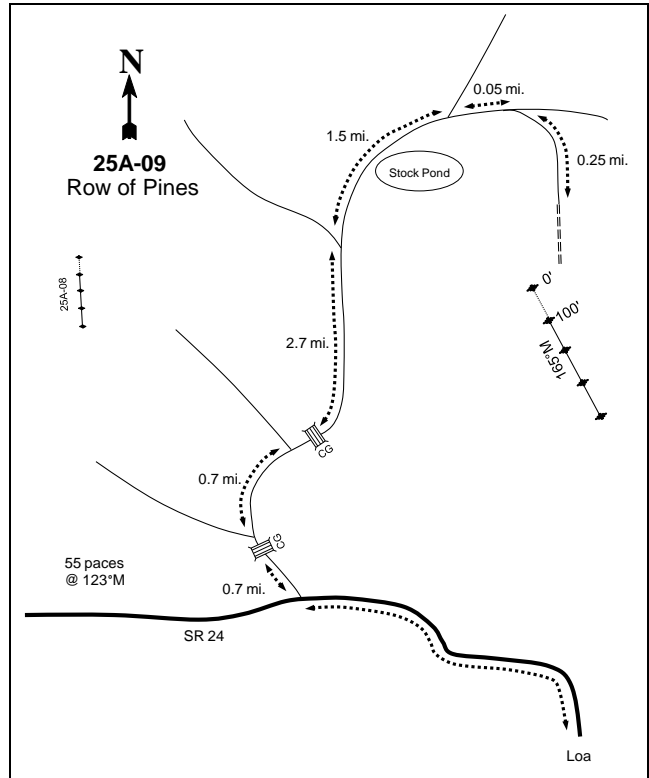
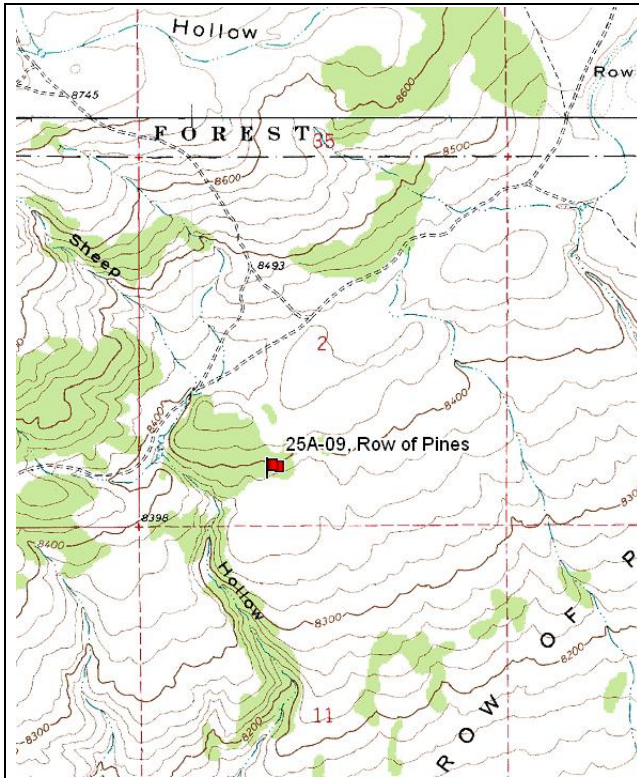
BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 8

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	%	%	%	Seedling (plants/acre)	%	%	% poor vigor	Average Height Crown (in)	
		Young	Mature	Decadent		moderate	heavy			
Artemisia frigida										
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	20	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
Artemisia nova										
99	20	0	100	-	-	100	0	0	5/9	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	

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 vaseyana</i>									
99	<b>6180</b>	12	72	15	100	37	17	6	16/26
04	<b>6540</b>	3	76	21	4740	48	17	7	16/28
09	<b>5020</b>	2	81	18	-	26	0	6	15/23
13	<b>5760</b>	32	60	8	5940	41	12	18	18/29
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	5/6
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
99	<b>20580</b>	68	31	0	2800	0	0	.09	6/6
04	<b>6800</b>	14	86	0	640	0	0	0	6/8
09	<b>1340</b>	1	99	0	20	0	0	0	6/5
13	<b>1280</b>	14	86	0	20	0	0	2	5/7
<i>Opuntia sp.</i>									
99	<b>40</b>	0	100	-	-	0	0	0	3/7
04	<b>40</b>	0	100	-	-	0	0	0	3/10
09	<b>60</b>	0	100	-	-	0	0	0	4/11
13	<b>80</b>	0	100	-	-	0	0	0	4/10
<i>Pediocactus simpsonii</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>40</b>	50	50	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	0/1
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
99	<b>0</b>	0	0	-	40	0	0	0	-/-
04	<b>0</b>	0	0	-	20	0	0	0	-/-
09	<b>20</b>	0	100	-	20	0	0	0	-/-
13	<b>60</b>	100	0	-	20	0	0	0	-/-

ROW OF PINES - TREND STUDY NO. 25A-9



**Location Information**

USGS 7.5 min Map Info      Loa; Township 27S, Range 2E, Section 2  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 442149 East 4259915 North

**Transect Information**

Browse Tag # (0' Stake)      7064  
 Transect Bearing              165° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Belt 4: 3ft

**Directions to Site**

From Loa, proceed northwest on SR 24 for 3.8 miles (0.9 miles beyond mile marker 49). Turn right and go 0.7 miles to a cattleguard. Just beyond the cattleguard turn right and go another 0.7 miles. Turn right and go across a cattleguard. Proceed 2.7 miles to an intersection, turn right and continue 1.3 miles to a stock pond on the east side of the road. Continue 0.2 miles to a fork, turn right and go 0.05 miles. Turn right and go 0.25 miles to the end of the road, where a pellet group transect begins. On the left side of the road is a gray fence post which marks the north end of the pellet transect. Count 16 stakes south through the belt of pinyon-juniper (the 16th stake is 25 feet from the trees). The beginning of the frequency baseline is 50 feet west of the 16th pellet group stake. Rebar (2-1/2 feet tall) is used to mark the transect. The 0-foot baseline stake has a red browse tag #7064 attached.

**Site Information**

Land Ownership SITLA  
 Allotment Seven Mile  
 Elevation 8,400ft (2,560m)  
 Aspect South  
 Slope 0-3%  
 Sample Dates 09/11/1985, 06/11/1991, 08/23/1999, 08/11/2004, 08/18/2009, 08/15/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Winter Crucial; Sage-Grouse, Habitat Winter, Nesting and Brood-Rearing

## VEGETATION HISTORY--

Management unit 25A, Study no: 9

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Recruitment of young sagebrush to the population was high in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 18 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

## SOIL ANALYSIS DATA--

Management unit 25A, Study no: 9

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	51.3	23.4	25.3	6.9	0.5	1.1	9.1	192.0	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since established in 1985, the site has remained in a stable state with Wyoming big sagebrush being the dominant shrub (Table - Browse Trends). The herbaceous understory has been limited and consisted mainly of native grasses and forbs (Appendix B -Pre-1992 Data) (Table - Herbaceous Trends). There is visual evidence of pinyon pine (*Pinus edulis*) establishment as early as 1985, though it has been slow to increase on the site (Table - Browse Characteristics).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25A, study no: 9

Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2.5	13.3	0.0	1.1	0.0	<b>50.6</b>	Good
0.9	5.8	0.0	0.5	0.0	<b>32.5</b>	Fair
5.9	4.8	0.0	0.1	0.0	<b>38.9</b>	Fair
15.0	8.1	0.0	0.6	0.0	<b>61.1</b>	Good

## HERBACEOUS TRENDS--

Management unit 25A, Study no: 9

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron smithii	14	3	7	13	.07	.00	.01	.07
G	Agropyron spicatum	6	-	-	1	.01	-	-	.00
G	Bouteloua gracilis	<sub>b</sub> 185	<sub>a</sub> 111	<sub>a</sub> 102	<sub>a</sub> 105	5.56	2.06	1.97	2.78
G	Oryzopsis hymenoides	10	3	8	13	.10	.04	.04	.20
G	Poa secunda	2	-	-	9	.00	-	-	.03
G	Sitanion hystrix	<sub>a</sub> 118	<sub>bc</sub> 64	<sub>ab</sub> 50	<sub>a</sub> 24	.84	.74	.37	.33
G	Stipa pinetorum	<sub>ab</sub> 5	<sub>b</sub> 12	<sub>a</sub> -	<sub>c</sub> 33	.03	.05	-	.61
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		340	193	167	198	6.63	2.90	2.40	4.04
Total for Grasses		340	193	167	198	6.63	2.90	2.40	4.04
F	Androsace septentrionalis (a)	<sub>c</sub> 91	<sub>b</sub> 13	<sub>a</sub> -	<sub>b</sub> 9	.44	.02	-	.02
F	Antennaria sp.	-	-	-	5	-	-	-	.03
F	Arabis demissa	<sub>ab</sub> 6	<sub>b</sub> 24	<sub>a</sub> -	<sub>c</sub> 36	.04	.05	-	.10
F	Astragalus lentiginosus	3	7	-	-	.01	.01	-	-
F	Chenopodium leptophyllum(a)	-	4	2	-	-	.01	.00	-
F	Cryptantha sp.	-	-	3	9	-	-	.01	.07
F	Descurainia pinnata (a)	5	1	-	-	.01	.00	-	-
F	Erigeron pumilus	<sub>b</sub> 35	<sub>a</sub> 6	<sub>a</sub> 9	<sub>ab</sub> 23	.23	.04	.02	.05
F	Eriogonum ovalifolium	<sub>b</sub> 14	<sub>ab</sub> 11	<sub>a</sub> 1	<sub>a</sub> 1	.19	.08	.00	.03
F	Phlox longifolia	-	6	-	-	.00	.01	-	-
F	Senecio multilobatus	<sub>b</sub> 23	<sub>ab</sub> 6	<sub>a</sub> -	<sub>a</sub> 2	.06	.04	-	.00
Total for Annual Forbs		96	18	2	9	0.45	0.04	0.00	0.02
Total for Perennial Forbs		81	60	13	76	0.54	0.26	0.03	0.28
Total for Forbs		177	78	15	85	0.99	0.30	0.04	0.31

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

BROWSE TRENDS--

Management unit 25A, Study no: 9

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia frigida	.03	.00	-	-	-	-	-
B	Artemisia nova	4.52	2.31	1.72	.63	2.33	1.25	1.86
B	Artemisia tridentata wyomingensis	24.41	17.31	18.51	21.01	21.43	19.45	26.16
B	Chrysothamnus viscidiflorus stenophyllus	-	.03	-	-	-	-	-
B	Gutierrezia sarothrae	4.71	.18	.10	.13	.51	.16	.08
B	Opuntia fragilis	.06	.18	.03	.00	.06	-	-
B	Pediocactus simpsonii	-	.00	-	-	-	-	-
B	Pinus edulis	-	.00	.03	-	-	-	-
Total for Browse		33.74	20.03	20.40	21.79	24.33	20.86	28.1

BASIC COVER--

Management unit 25A, Study no: 9

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	41.90	23.89	24.38	28.16
Rock	8.67	6.71	4.84	9.79
Pavement	33.30	27.16	23.90	31.75
Litter	22.44	32.82	29.05	32.80
Cryptogams	2.31	1.96	.51	.82
Bare Ground	18.19	23.42	23.30	9.71

PELLET GROUP DATA--

Management unit 25A, Study no: 9

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	28	49	49	17	-	-	-	-
Grouse	-	-	-	1	-	-	-	-
Elk	-	-	2	3	1 (2)	-	11 (28)	1 (3)
Deer	15	30	16	5	13 (32)	49 (121)	21 (53)	8 (21)
Cattle	3	2	-	-	3 (7)	2 (5)	2 (5)	3 (9)

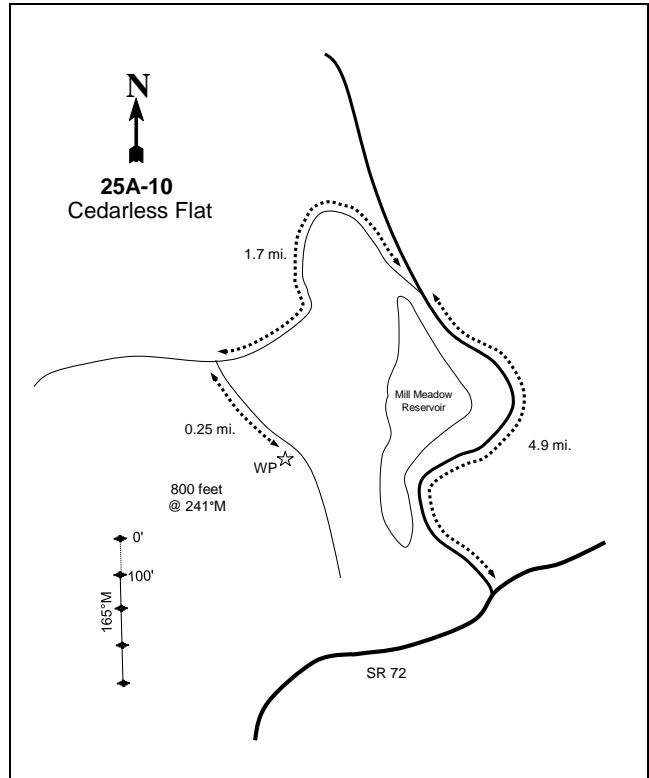
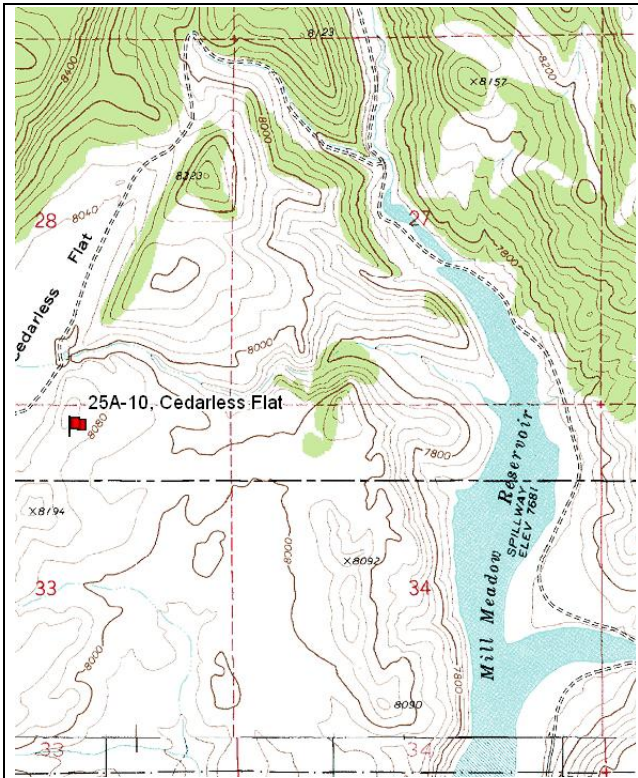
BROWSE CHARACTERISTICS--  
Management unit 25A, Study no: 9

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia frigida</i>										
99	240	8	83	8	-	17	42	0	3/4	
04	100	20	80	0	-	0	0	0	5/6	
09	20	0	100	0	-	0	0	0	7/2	
13	40	0	100	0	-	0	0	0	-/-	
<i>Artemisia nova</i>										
99	1600	5	76	19	-	69	5	8	10/17	
04	1300	0	71	29	100	6	0	18	7/17	
09	940	0	30	70	-	34	38	64	8/17	
13	700	3	77	20	-	69	0	34	8/15	
<i>Artemisia tridentata wyomingensis</i>										
99	7100	5	54	41	120	43	12	18	18/28	
04	5760	2	48	50	1380	30	6	27	16/26	
09	7180	13	50	38	380	17	11	30	14/22	
13	9160	32	53	15	3920	38	19	19	16/27	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
99	0	0	0	-	-	0	0	0	-/-	
04	60	0	100	-	-	0	0	0	5/6	
09	0	0	0	-	-	0	0	0	4/6	
13	20	0	100	-	-	100	0	100	-/-	
<i>Eriogonum microthecum</i>										
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	3/5	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
99	11300	8	90	2	860	0	0	.88	8/9	
04	640	6	94	0	-	0	0	0	6/7	
09	500	0	100	0	-	0	0	4	6/7	
13	1020	86	14	0	860	0	0	0	5/5	
<i>Opuntia fragilis</i>										
99	260	15	85	-	20	0	0	0	3/9	
04	220	0	100	-	-	0	0	9	2/10	
09	160	0	100	-	-	0	0	0	2/9	
13	80	25	75	-	20	0	0	0	2/5	
<i>Pediocactus simpsonii</i>										
99	20	0	100	-	-	0	0	0	1/2	
04	160	0	100	-	-	0	0	0	1/2	
09	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	1/3	

		Age class distribution						Utilization	
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Pinus edulis									
99	<b>0</b>	0	0	-	40	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>20</b>	100	0	-	40	0	0	0	-/-
13	<b>40</b>	100	0	-	-	0	0	50	-/-



CEDARLESS FLAT - TREND STUDY NO. 25A-10



**Location Information**

USGS 7.5 min Map Info Forsyth Reservoir; Township 26S, Range 3E, Section 33  
 GPS (0' Stake) NAD 83, UTM Zone 12, 448783 East 4262764 North

**Transect Information**

Browse Tag # (0' Stake) 407  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

From Fremont, travel northeast on SR 72 for 2.25 miles to a major fork (the sign says Mill Meadow Reservoir). Turn left and proceed 4.5 miles past the reservoir to Fremont Creek. Cross the bridge and go 0.4 miles to a fork. Bear left on the Mytoge Road and go 1.1 miles to a cattleguard in Cedarless Flat. From the cattleguard, go 0.6 miles to a fork. Turn left and go exactly 0.25 miles to a witness post on the south side of the road. From the witness post, go 800 feet at 241° magnetic to the 0 ft baseline stake. The baseline stake is marked with a red browse tag number 407.

**Site Information**

Land Ownership USFS  
 Allotment UM Creek  
 Elevation 8,200ft (2,499m)  
 Aspect Southeast  
 Slope 12%  
 Sample Dates 09/10/1985, 06/13/1991, 08/25/1999, 08/10/2004, 08/18/2009, 08/12/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 10

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1987	-
Seeding	-	-	1987	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer, Fawning; Elk, Crucial Summer, Fawning; Pronghorn, Crucial Winter; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 10

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The ridgeline to the south west is covered by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*).

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 1

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	43.3	25.4	31.3	7.4	0.6	2.6	7.0	112.0	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since established in 1985, the site has remained in a stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) being the dominant shrub, though the site was chained in 1987. The herbaceous understory has been limited and consisted mainly of native grasses and forbs (Appendix B -Pre-1992 Data)

(Table - Herbaceous Trends). Pinyon and juniper trees are located near the site but have been slow to spread. Without disturbance, sagebrush will likely remain the dominant component of the site.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 25A, study no: 10

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	11.6	13.8	15.0	26.6	0.0	0.1	0.0	<b>67.1</b>	Excellent
2004	9.7	3.6	2.5	8.6	0.0	0.0	0.0	<b>24.4</b>	Poor-Fair
2009	12.1	10.5	5.0	11.8	0.0	0.0	0.0	<b>39.3</b>	Fair
2013	14.2	12.0	10.5	20.8	0.0	0.0	0.0	<b>57.4</b>	Good

#### HERBACEOUS TRENDS--

Management unit 25A, Study no: 10

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	42	29	21	19	1.15	.69	.28	.66
G	Bouteloua gracilis	c221	a108	a117	b162	8.30	1.89	3.36	5.27
G	Bromus inermis	b13	a-	a-	a-	.22	-	.00	-
G	Carex sp.	a16	ab16	ab17	b29	.07	.07	.06	.13
G	Elymus junceus	ab63	a53	bc68	c97	2.60	1.41	1.89	3.68
G	Oryzopsis hymenoides	b37	a19	a10	a3	.72	.08	.04	.04
G	Poa fendleriana	-	-	3	6	-	-	.00	.01
G	Sitanion hystrix	b29	ab19	a13	ab17	.20	.12	.22	.49
G	Stipa lettermani	4	-	1	7	.01	-	.00	.07
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		425	244	250	340	13.29	4.28	5.88	10.38
Total for Grasses		425	244	250	340	13.29	4.28	5.88	10.38
F	Androsace septentrionalis (a)	b11	a-	a-	a-	.02	-	-	-
F	Arabis demissa	4	-	-	-	.00	-	-	-
F	Astragalus lentiginosus	5	1	1	-	.03	.00	.00	-
F	Chenopodium fremontii (a)	a-	b25	a1	a-	-	.27	.00	-
F	Chenopodium leptophyllum(a)	a-	c258	b26	a-	-	6.38	.06	-
F	Cryptantha sp.	1	-	-	3	.03	-	-	.00
F	Descurainia pinnata (a)	-	3	-	-	-	.00	-	-
F	Eriogonum cernuum (a)	-	3	-	-	-	.00	-	-
F	Phlox longifolia	1	2	-	3	.00	.00	-	.01
Total for Annual Forbs		11	289	27	0	0.02	6.66	0.07	0
Total for Perennial Forbs		11	3	1	6	0.07	0.01	0.00	0.01
Total for Forbs		22	292	28	6	0.10	6.67	0.07	0.01

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

BROWSE TRENDS--

Management unit 25A, Study no: 10

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia nova	-	.01	-	-	-	.15	-
B	Artemisia tridentata wyomingensis	9.25	7.77	9.66	11.32	11.51	14.95	12.63
B	Chrysothamnus viscidiflorus viscidiflorus	.15	.15	.15	.18	-	.10	5.35
B	Gutierrezia sarothrae	.38	.26	.04	.19	.30	.03	.36
B	Opuntia sp.	.03	.03	.03	.06	.03	.10	.15
B	Pediocactus simpsonii	.03	.03	-	.01	-	-	-
Total for Browse		9.84	8.27	9.89	11.78	11.84	15.33	18.49

BASIC COVER--

Management unit 25A, Study no: 10

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	23.21	18.60	16.25	25.78
Rock	9.06	7.65	3.79	17.80
Pavement	27.46	44.12	46.21	40.21
Litter	13.74	19.39	18.38	17.58
Cryptogams	.00	0	.01	.01
Bare Ground	20.26	23.66	16.10	10.78

PELLET GROUP DATA--

Management unit 25A, Study no: 10

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	9	40	59	13	-	-	-	-
Elk	6	2	5	2	21 (52)	5 (12)	15 (38)	7 (18)
Deer	8	17	14	7	7 (17)	33 (81)	51 (126)	36 (89)
Cattle	3	1	1	-	4 (10)	3 (7)	2 (5)	9 (23)
Antelope	-	2	-	-	-	-	-	-

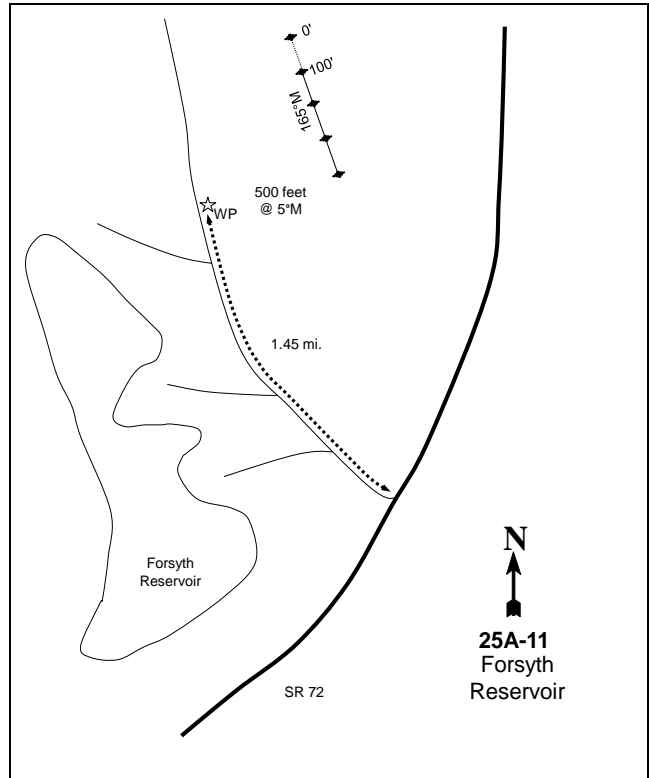
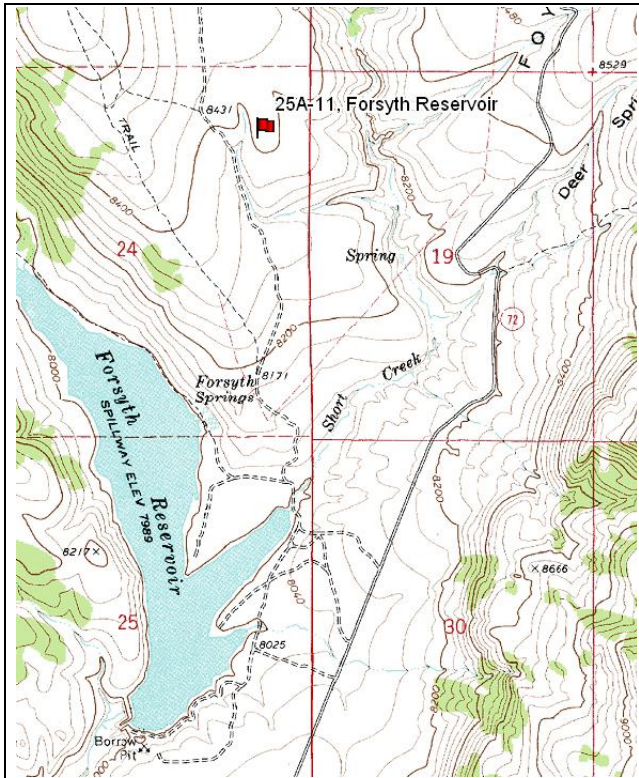
BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 10

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Artemisia nova									
99	<b>80</b>	0	100	0	-	0	0	0	6/15
04	<b>200</b>	0	100	0	-	10	0	0	10/19
09	<b>120</b>	0	67	33	20	0	0	17	9/14
13	<b>0</b>	0	0	0	-	0	0	0	-/-

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>									
99	5440	31	65	4	40	52	15	3	13/22
04	4320	5	57	38	320	36	10	27	13/23
09	5240	10	75	15	220	33	11	7	13/23
13	5040	21	68	10	680	42	23	19	14/28
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	240	0	92	8	-	17	8	8	7/12
04	240	0	100	0	80	0	0	0	7/13
09	260	8	92	0	20	0	0	0	6/11
13	280	14	79	7	-	7	0	14	7/14
<i>Gutierrezia sarothrae</i>									
99	4240	52	48	-	100	0	0	0	4/4
04	1720	5	95	-	-	0	0	0	5/7
09	160	13	88	-	-	0	0	0	5/5
13	960	44	56	-	-	0	2	0	4/6
<i>Leptodactylon pungens</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	8/15
<i>Opuntia sp.</i>									
99	80	25	75	-	-	0	0	0	3/10
04	100	20	80	-	-	0	0	0	2/9
09	40	50	50	-	-	0	0	100	2/9
13	80	25	75	-	-	0	0	0	2/8
<i>Pediocactus simpsonii</i>									
99	60	33	67	-	-	0	0	0	2/4
04	40	0	100	-	-	0	0	0	1/3
09	0	0	0	-	-	0	0	0	-/-
13	40	0	100	-	-	0	0	0	0/2
<i>Pinus edulis</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	20	0	0	0	-/-

FORSYTH RESERVOIR - TREND STUDY NO. 25A-11



**Location Information**

USGS 7.5 min Map Info Forsyth Reservoir; Township 26S, Range 3E, Section 24  
 GPS (0' Stake) NAD 83, UTM Zone 12, 454121 East 4265787 North

**Transect Information**

Browse Tag # (0' Stake) 7062  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Between Lyman and Loa, turn north towards Fremont to connect with SR 72. Travel north on SR 72 until you cross a Forest Service boundary cattleguard (about 5 miles from Fremont). Continue another 2.7 miles to Forsyth Reservoir. Turn at the Forsyth Reservoir sign and drive 0.3 miles to a fork. Turn right and continue 0.1 miles to where the road crosses Short Creek (which empties into the east cove of Forsyth). From Short Creek, go up 0.1 miles to a fork. Turn right and go 0.25 miles to a cattleguard. Continue 0.15 miles beyond the cattleguard to a fork. Take the right fork and travel 0.55 miles to a draw below a ridge to the northeast. There is a steel rebar witness post on the right side of the road. The last baseline stake is located 500 feet away at a bearing of 5° magnetic on top of the ridge. The 0-foot baseline stake is 400 feet due north, and has a red browse tag #7062 attached.

**Site Information**

Land Ownership USFS  
 Allotment Tidwell  
 Elevation 8,400ft (2,560m)  
 Aspect Southwest  
 Slope 12%  
 Sample Dates 09/12/1985, 06/13/1991, 08/19/1999, 08/26/2004, 08/19/2009, 08/14/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer, Calving/Fawning; Elk, Crucial Summer, Calving/Fawning; Sage-Grouse, Habitat Winter, Nesting and Brood-Rearing

VEGETATION HISTORY--

Management unit 25A, Study no: 11

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Black Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A large area was sprayed with 2,4-D in the spring of 1976 to reduce shrub competition and release the grasses and forbs; however, it does not appear that the site itself was sprayed. Elk presence was high in 1999, but was low in all other sample years (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Black Sagebrush\)](#)  
 NRCS Ecological Site # R047XB309UT

SOIL ANALYSIS DATA--

Management unit 25A, Study no: 11

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	41.3	35.4	23.3	7	0.5	2.2	2.6	89.6	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1985, the site has remained in a stable black sagebrush (*Artemisia nova*) community. There is a number of other shrub species present which provided limited cover (Table - Browse Trends). Over the sample years, the herbaceous understory has remained diverse and consisted of native perennial grasses and forbs, though the forbs have offered limited cover (Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25A, study no: 11

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	24.5	6.4	13.4	13.6	0.0	2.1	0.0	<b>60.1</b>	Fair
2004	20.0	3.3	0.1	25.7	0.0	2.1	0.0	<b>51.1</b>	Poor-Fair
2009	18.9	4.3	4.0	20.0	0.0	0.5	0.0	<b>47.6</b>	Poor
2013	24.4	13.2	11.9	30.0	0.0	2.8	0.0	<b>82.3</b>	Excellent

## HERBACEOUS TRENDS--

Management unit 25A, Study no: 11

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron dasystachyum	a-	a-	a-	b11	-	-	-	.02
G	Agropyron spicatum	-	1	-	1	-	.03	-	.00
G	Agropyron trachycaulum	9	-	-	-	.04	-	-	-
G	Bouteloua gracilis	a187	a206	a215	b260	2.44	5.97	5.56	11.04
G	Carex sp.	a36	a51	a39	b74	.14	.46	.18	.86
G	Festuca ovina	-	-	-	7	-	-	-	.04
G	Poa fendleriana	129	137	138	137	2.00	3.46	2.34	3.83
G	Sitanion hystrix	b92	b83	ab71	a34	.66	1.36	.59	.45
G	Stipa comata	b40	a11	ab15	c62	.37	.15	.10	1.40
G	Stipa lettermani	90	77	96	92	1.14	1.37	1.18	1.52
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		583	566	574	678	6.82	12.83	9.98	19.19
Total for Grasses		583	566	574	678	6.82	12.83	9.98	19.19
F	Androsace septentrionalis (a)	3	2	-	5	.03	.00	-	.01
F	Arabis demissa	a26	a9	a9	b108	.05	.02	.03	.23
F	Astragalus serpens	-	3	-	4	-	.00	-	.00
F	Chaenactis douglasii	3	5	-	-	.00	.06	-	-
F	Erigeron pumilus	b71	a20	a63	c101	.19	.07	.18	.76
F	Gayophytum ramosissimum(a)	-	2	-	-	-	.01	-	-
F	Hymenoxys richardsonii	17	-	-	-	.70	-	-	-
F	Penstemon sp.	11	-	-	5	.02	-	-	.01
F	Phlox austromontana	2	-	-	1	.01	-	-	.00
F	Phlox longifolia	b19	a2	a4	ab18	.05	.01	.01	.04
F	Polygonum douglasii (a)	-	2	-	-	-	.00	-	-
F	Potentilla pennsylvanica	1	4	4	7	.00	.03	.01	.06
F	Senecio multilobatus	a10	b45	a3	b36	.02	.86	.00	.25
Total for Annual Forbs		3	6	0	5	0.03	0.02	0	0.01
Total for Perennial Forbs		160	88	83	280	1.07	1.06	0.24	1.38
Total for Forbs		163	94	83	285	1.11	1.08	0.24	1.39

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



BROWSE TRENDS--

Management unit 25A, Study no: 11

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia frigida	.16	.29	.09	.25	.58	.18	.21
B	Artemisia nova	19.44	15.64	15.02	19.28	14.90	17.23	23.71
B	Artemisia tridentata vaseyana	-	-	-	.01	.65	.96	.80
B	Chrysothamnus viscidiflorus viscidiflorus	1.60	1.58	.86	.97	2.01	1.03	.93
B	Coryphantha vivipara arizonica	.06	-	-	.03	-	-	-
B	Eriogonum microthecum	.03	.09	.00	.03	-	.01	-
B	Gutierrezia sarothrae	.01	.18	.03	.08	.30	-	.01
B	Leptodactylon pungens	-	-	-	.00	-	-	-
B	Pediocactus simpsonii	.03	.01	.01	.03	-	-	-
T	Pinus edulis	-	-	-	-	.03	.05	.01
Total for Browse		21.35	17.80	16.02	20.70	18.47	19.46	25.67

BASIC COVER--

Management unit 25A, Study no: 11

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	32.02	31.75	28.88	47.08
Rock	14.71	9.88	8.82	26.88
Pavement	38.55	47.79	47.76	25.22
Litter	7.76	20.64	22.36	13.42
Cryptogams	1.71	1.79	.64	1.22
Bare Ground	3.56	4.67	6.38	.34

PELLET GROUP DATA--

Management unit 25A, Study no: 11

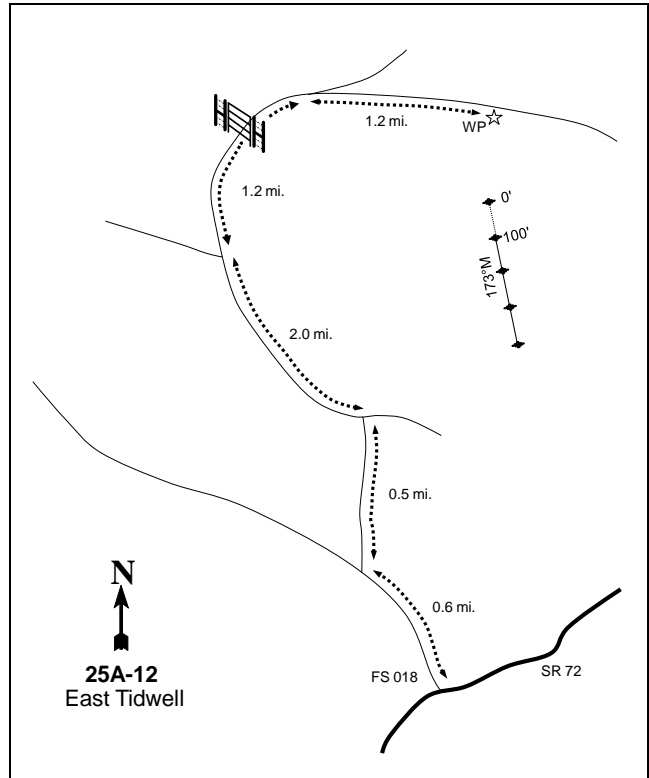
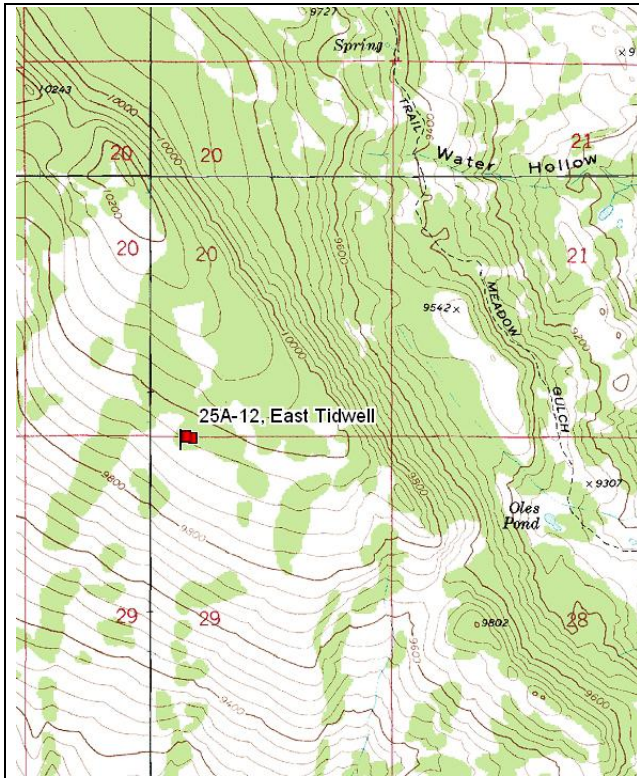
Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	6	10	47	3	-	-	-	-
Grouse	-	-	-	-	-	-	139 Pellets/acre	-
Elk	19	16	26	11	60 (148)	14 (35)	34 (84)	3 (8)
Deer	5	3	1	4	2 (5)	2 (5)	-	1 (3)
Cattle	2	1	3	4	7 (17)	4 (11)	10 (25)	1 (3)

BROWSE CHARACTERISTICS--  
Management unit 25A, Study no: 11

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia frigida</i>										
99	2240	13	88	0	40	8	0	0	4/6	
04	1780	6	93	1	-	2	0	0	7/9	
09	960	19	81	0	120	0	0	2	5/7	
13	1280	16	84	0	20	59	3	0	3/6	
<i>Artemisia nova</i>										
99	28180	27	43	29	120	37	.63	2	7/16	
04	13080	0	60	40	240	0	0	19	8/15	
09	15180	8	56	36	4540	5	0	16	8/15	
13	17820	24	70	6	4100	45	11	5	7/16	
<i>Artemisia tridentata vaseyana</i>										
99	40	0	100	-	-	50	50	0	11/25	
04	40	0	100	-	-	0	0	0	18/34	
09	40	0	100	-	80	0	0	0	16/34	
13	120	67	33	-	60	67	33	0	18/49	
<i>Chrysothamnus nauseosus</i>										
99	20	0	100	-	-	0	100	0	7/9	
04	0	0	0	-	-	0	0	0	31/35	
09	20	0	100	-	-	0	0	0	27/28	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus parryi</i>										
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	8/14	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
99	1900	5	91	4	-	2	1	2	6/11	
04	1560	8	85	8	-	0	0	1	6/11	
09	1200	20	70	10	20	0	0	8	6/9	
13	1100	5	93	2	-	62	0	44	5/11	
<i>Coryphantha vivipara arizonica</i>										
99	120	0	100	-	-	0	0	0	1/2	
04	20	0	100	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Eriogonum microthecum</i>										
99	220	18	64	18	-	36	0	18	5/9	
04	200	0	100	0	-	0	40	0	6/9	
09	180	0	100	0	-	0	0	0	5/7	
13	160	13	88	0	-	13	0	0	6/10	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
99	80	0	100	-	-	0	0	0	6/7	
04	340	6	94	-	-	0	0	0	7/8	
09	180	22	78	-	-	0	0	0	6/6	
13	660	42	58	-	-	0	0	0	3/4	
<i>Leptodactylon pungens</i>										
99	120	0	100	-	-	0	0	0	7/9	
04	120	0	100	-	-	0	0	0	5/6	
09	40	0	100	-	-	0	0	0	2/5	
13	120	17	83	-	-	0	0	0	6/12	
<i>Pediocactus simpsonii</i>										
99	40	50	50	-	-	0	0	0	1/3	
04	60	0	100	-	-	0	0	0	1/2	
09	20	0	100	-	-	0	0	0	0/2	
13	40	0	100	-	-	0	0	0	1/3	
<i>Pinus edulis</i>										
99	20	100	0	-	-	0	0	0	-/-	
04	20	100	0	-	-	100	0	0	-/-	
09	20	100	0	-	-	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	-/-	
<i>Tetradymia canescens</i>										
99	20	0	100	-	-	0	0	0	7/10	
04	20	0	100	-	-	0	0	0	10/21	
09	0	0	0	-	-	0	0	0	13/31	
13	0	0	0	-	-	0	0	0	-/-	

EAST TIDWELL - TREND STUDY NO. 25A-12



**Location Information**

USGS 7.5 min Map Info Geyser Peak; Township 25S, Range 4E, Section 29  
 GPS (0' Stake) NAD 83, UTM Zone 12, 456537 East 4274079 North

**Transect Information**

Browse Tag # (0' Stake) 9078  
 Transect Bearing 173° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Traveling north on SR 72 from Fremont, turn west on Forest Service road #018 (between the cattleguard and mile marker #16). Go 0.6 miles (crossing a cattleguard) to a fork in the road, go right. One-half mile later you'll come to a "T" in the road, stay to the left. Go 2.0 miles and turn right at a fork that goes up a steep hill. After 0.1 miles there is a faint intersection. Stay on the main road heading north for 0.9 miles to a gate. Go through the gate and go 0.2 miles to a fork in the road. Stay to the right and go through a grove of trees, up a steep, rocky road. Here the road becomes very faint, but travel 1.2 miles to a witness post. The 0 foot baseline stake is easy to see, and has browse tag #9078 attached.

### Site Information

Land Ownership USFS  
Allotment Solomon  
Elevation 10,000ft (3,048m)  
Aspect Southwest  
Slope 7-12%  
Sample Dates 06/18/1991, 08/18/1999, 08/23/2004, 08/19/2009, 08/13/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer, Calving/Fawning; Elk, Crucial Summer, Calving/Fawning; Sage-Grouse, Habitat Not Winter

### VEGETATION HISTORY--

Management unit 25A, Study no: 12

Year	Vegetation Type <sup>1</sup>
1991-2013	Perennial Grass/Parry Rabbitbrush

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

### Site Notes

Large aspen (*Populus tremuloides*) stands grow to the north and west of the site. Elk presence was high in 1999, 2009, 2013, but moderate in 2004 (Table - Pellet Group Data).

### Site Potential

1981-2010 Average Annual Precipitation 23 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site High Mountain Loam (Mountain Big Sagebrush)  
NRCS Ecological Site # R047XB516UT

### SOIL ANALYSIS DATA--

Management unit 25A, Study no: 12

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	47.3	29.4	23.3	7.5	0.6	3.1	21.0	166.4	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [High Mountain Loam \(Mountain Big Sagebrush\), R047XA516UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1991, this site has remained in a stable state with Parry rabbitbrush (*Chrysothamnus parryi*) being the dominant shrub component. This site has supported a number of mountain brush species that provided limited cover; however, black sagebrush (*Artemisia nova*) has steadily increased in cover and abundance over the sample years (Table - Browse Trends, Table - Browse Characteristics). The herbaceous community has had a diverse component of perennial native forbs and grasses that have fluctuated in cover and composition over the sample years (Table - Herbaceous Trends). As the length of time elapsed since last fire increases, the mountain big sagebrush and snowberry (*Symphoricarpos oreophilus*) will slowly return to dominate the site while the understory diminishes (USDA-NRCS, 2011).

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 25A, Study no: 12

T y p e	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	<i>Agropyron dasystachyum</i>	a26	b88	b60	b101	.32	1.04	.52	1.03
G	<i>Bouteloua gracilis</i>	ab15	a2	b33	ab14	.03	.00	.52	.08
G	<i>Carex</i> sp.	a9	ab16	b29	a10	.10	.16	.13	.24
G	<i>Festuca ovina</i>	b84	a21	a2	b65	.70	.10	.00	.67
G	<i>Koeleria cristata</i>	b180	b177	a79	a140	2.15	3.16	.72	2.48
G	<i>Poa fendleriana</i>	b181	a109	ab157	a113	2.92	1.53	2.28	2.63
G	<i>Sitanion hystrix</i>	b91	ab71	a42	ab64	1.22	.98	.48	1.23
G	<i>Stipa comata</i>	b11	a1	a-	b18	.06	.04	-	.21
G	<i>Stipa lettermani</i>	a75	b133	a69	b113	1.35	2.29	1.22	2.08
G	<i>Stipa pinetorum</i>	-	-	12	-	-	-	.09	-
G	<i>Vulpia octoflora</i> (a)	-	-	4	-	-	-	.01	-
Total for Annual Grasses		0	0	4	0	0	0	0.01	0
Total for Perennial Grasses		672	618	483	638	8.88	9.33	5.98	10.67
Total for Grasses		672	618	487	638	8.88	9.33	6.00	10.67
F	<i>Agoseris glauca</i>	b21	a4	a-	ab13	.15	.09	-	.08
F	<i>Allium</i> sp.	-	-	-	2	-	-	-	.03
F	<i>Androsace septentrionalis</i> (a)	b33	a1	a-	b52	.11	.00	-	.14
F	<i>Antennaria parvifolia</i>	70	73	72	70	1.21	2.53	1.41	1.94
F	<i>Antennaria</i> sp.	a-	a-	a-	b35	-	-	-	.87
F	<i>Arabis</i> sp.	-	-	-	1	-	-	-	.00
F	<i>Aster</i> sp.	9	1	5	12	.01	.00	.01	.07
F	<i>Astragalus agrestis</i>	58	64	61	87	1.55	.76	.24	1.23
F	<i>Astragalus cibarius</i>	-	-	-	1	-	-	-	.00
F	<i>Astragalus miser</i>	-	-	-	8	-	-	-	.04
F	<i>Chaenactis douglasii</i>	a8	ab12	ab14	b29	.01	.17	.10	.19
F	<i>Comandra pallida</i>	b9	ab7	a-	b19	.10	.04	-	.06
F	<i>Erigeron eatonii</i>	a16	a13	b46	b60	.32	.08	.66	1.14
F	<i>Erigeron flagellaris</i>	a6	a8	b28	ab22	.01	.18	.10	.41
F	<i>Erigeron pumilus</i>	ab63	b88	a47	a38	1.10	1.80	.27	.80
F	<i>Eriogonum alatum</i>	5	10	11	8	.06	.09	.07	.05
F	<i>Eriogonum umbellatum</i>	ab31	ab32	a15	b45	.52	.46	.23	.84
F	<i>Gayophytum ramosissimum</i> (a)	-	-	5	-	-	-	.00	-
F	<i>Gentiana calycosa</i>	b18	a-	a-	a-	.25	-	-	-
F	<i>Geranium caespitosum</i>	bc109	c119	a71	ab65	1.65	1.73	.38	.46
F	<i>Hymenoxys richardsonii</i>	b70	a48	a37	a48	1.59	1.08	.85	.89
F	<i>Lappula occidentalis</i> (a)	-	-	-	3	-	-	-	.03
F	<i>Lesquerella wardii</i>	b14	ab5	a-	ab9	.05	.01	-	.02
F	<i>Linum lewisii</i>	b59	ab31	a11	b44	.86	.57	.14	.26
F	<i>Lupinus argenteus</i>	a8	a6	ab12	b24	.39	.40	.06	.38
F	<i>Lychnis drummondii</i>	b14	a-	a-	a5	.06	-	-	.01
F	<i>Lygodesmia</i> sp.	-	-	-	-	-	.00	-	-

T y P e	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	<i>Machaeranthera canescens</i>	<sub>a</sub> 7	<sub>ab</sub> 14	<sub>b</sub> 34	<sub>c</sub> 79	.07	.24	.39	.53
F	<i>Oxytropis lambertii</i>	<sub>b</sub> 50	<sub>a</sub> 5	<sub>a</sub> -	<sub>a</sub> 3	.49	.30	-	.00
F	<i>Penstemon procerus</i>	<sub>b</sub> 84	<sub>a</sub> 41	<sub>a</sub> 65	<sub>a</sub> 45	.43	.33	.28	.20
F	<i>Phlox longifolia</i>	<sub>ab</sub> 51	<sub>b</sub> 69	<sub>b</sub> 62	<sub>a</sub> 28	.17	.29	.26	.09
F	<i>Polygonum douglasii</i> (a)	2	-	-	-	.00	-	-	-
F	<i>Potentilla gracilis</i>	<sub>a</sub> 26	<sub>b</sub> 66	<sub>a</sub> 16	<sub>a</sub> 15	.06	.72	.10	.09
F	<i>Potentilla hippiana</i>	41	26	28	26	.75	.83	.14	.73
F	<i>Potentilla pennsylvanica</i>	6	-	-	8	.04	-	-	.04
F	<i>Senecio multilobatus</i>	<sub>c</sub> 168	<sub>b</sub> 81	<sub>a</sub> 38	<sub>b</sub> 70	1.60	.64	.11	.56
F	<i>Taraxacum officinale</i>	<sub>b</sub> 14	<sub>ab</sub> 9	<sub>a</sub> -	<sub>b</sub> 10	.10	.02	-	.08
Total for Annual Forbs		35	1	5	55	0.11	0.00	0.00	0.17
Total for Perennial Forbs		1035	832	673	929	13.69	13.43	5.87	12.17
Total for Forbs		1070	833	678	984	13.80	13.44	5.87	12.34

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 12

T y P e	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia frigida</i>	.37	.79	.54	.71	.83	.51	.66
B	<i>Artemisia nova</i>	.53	.78	.80	3.80	.33	.66	3.76
B	<i>Artemisia tridentata vaseyana</i>	.15	.19	.90	1.42	.56	1.11	2.26
B	<i>Chrysothamnus parryi</i>	5.83	10.76	5.35	6.82	16.40	5.08	7.10
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	.71	1.06	.50	1.35	3.25	.71	1.21
B	<i>Gutierrezia sarothrae</i>	.06	1.82	.07	.65	2.50	.01	.35
B	<i>Tetradymia canescens</i>	.95	1.93	.59	1.49	2.30	1.04	1.95
Total for Browse		8.61	17.35	8.77	16.25	26.17	9.12	17.29

#### BASIC COVER--

Management unit 25A, Study no: 12

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	30.06	34.51	24.17	40.04
Rock	10.85	9.95	8.51	24.41
Pavement	43.96	54.81	42.78	41.21
Litter	6.20	8.01	11.38	11.97
Cryptogams	.18	.24	.01	.09
Bare Ground	4.02	8.05	11.56	3.54

PELLET GROUP DATA--

Management unit 25A, Study no: 12

Type	Quadrat Frequency			
	'99	'04	'09	'13
Rabbit	12	34	33	13
Grouse	-	-	1	-
Elk	37	25	40	24
Deer	17	15	14	10
Cattle	2	1	1	-

Days use per acre (ha)			
'99	'04	'09	'13
-	-	-	-
-	-	-	-
68 (168)	35 (86)	52 (129)	66 (164)
15 (37)	16 (40)	20 (50)	1 (3)
1 (2)	5 (13)	7 (18)	2 (5)

BROWSE CHARACTERISTICS--

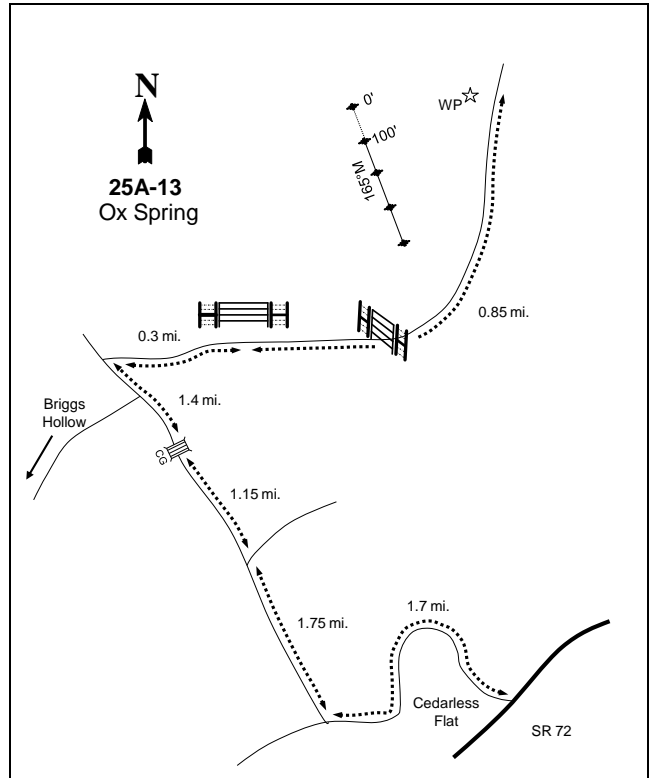
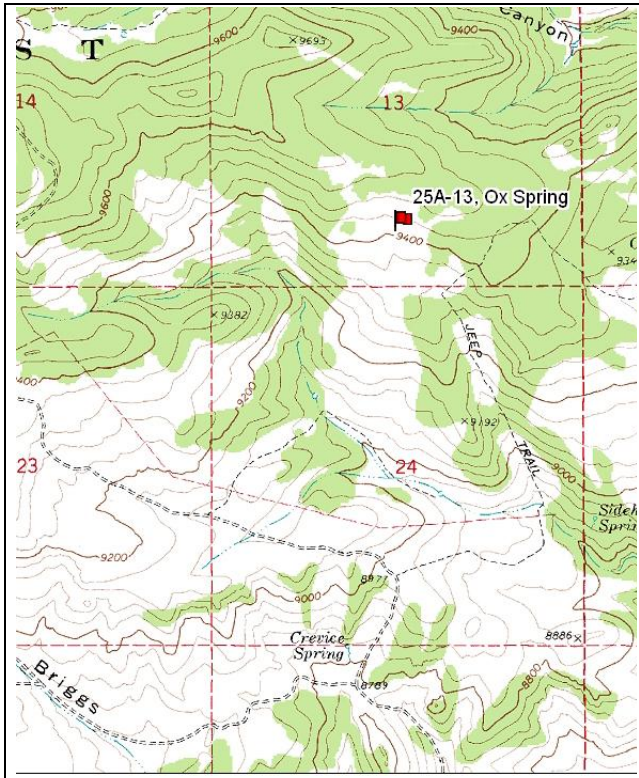
Management unit 25A, Study no: 12

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia frigida</i>									
99	<b>4520</b>	14	86	-	80	1	0	0	5/7
04	<b>1240</b>	5	95	-	-	8	2	0	8/11
09	<b>1100</b>	0	100	-	-	5	0	0	4/9
13	<b>2560</b>	18	82	-	2000	61	4	0	4/7
<i>Artemisia nova</i>									
99	<b>140</b>	29	71	-	-	0	0	0	10/28
04	<b>380</b>	32	68	-	80	0	0	0	10/20
09	<b>2280</b>	60	40	-	1160	0	0	0	6/16
13	<b>3220</b>	34	66	-	400	45	.62	0	7/19
<i>Artemisia tridentata vaseyana</i>									
99	<b>40</b>	0	100	0	-	50	0	0	8/20
04	<b>240</b>	8	92	0	120	42	8	0	13/28
09	<b>1320</b>	56	36	8	280	8	0	5	9/16
13	<b>2220</b>	56	44	0	700	14	4	0	7/17
<i>Chrysothamnus parryi</i>									
99	<b>13140</b>	9	87	4	120	.76	0	1	5/8
04	<b>7420</b>	5	93	1	120	2	.53	.26	5/9
09	<b>19960</b>	15	85	0	460	0	0	0	4/8
13	<b>13400</b>	8	91	0	60	14	2	0	5/9
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	<b>2220</b>	10	86	5	-	0	.90	4	5/9
04	<b>2480</b>	4	91	5	-	0	0	4	7/12
09	<b>2520</b>	6	93	1	-	0	0	0	4/8
13	<b>1420</b>	14	83	3	100	3	7	0	6/12
<i>Gutierrezia sarothrae</i>									
99	<b>960</b>	10	90	-	20	0	0	0	4/6
04	<b>3860</b>	0	100	-	-	0	0	0	5/8
09	<b>280</b>	0	100	-	-	0	0	0	4/6
13	<b>740</b>	11	89	-	60	0	0	0	4/7



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Symphoricarpos oreophilus</i>										
99	<b>20</b>	0	100	-	-	100	0	0	8/30	
04	<b>0</b>	0	0	-	-	0	0	0	10/31	
09	<b>60</b>	0	100	-	-	0	0	0	10/24	
13	<b>20</b>	0	100	-	-	0	0	0	7/25	
<i>Tetradymia canescens</i>										
99	<b>2280</b>	27	68	4	80	9	0	.87	6/9	
04	<b>3120</b>	9	90	1	-	7	2	3	6/11	
09	<b>2320</b>	19	80	1	140	0	0	3	5/8	
13	<b>2060</b>	14	86	0	40	26	2	0	7/11	

OX SPRING - TREND STUDY NO. 25A-13



**Location Information**

USGS 7.5 min Map Info Fish Lake; Township 26S, Range 2E, Section 13  
 GPS (0' Stake) NAD 83, UTM Zone 12, 444004 East 4266336 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Turn west off of SR 72 onto the Mill Meadow Road north of Fremont. Go past the lake and up the Johnson Reservoir Road for 3.8 miles. Turn west off the paved road and go 1.1 miles to a cattle guard at the head of Cedarless Flat. Continue 0.6 miles to a fork in the road. Go right for 1.75 miles to the Ox Spring trail turnoff. Stay left (on the main road) for 1.15 miles to another cattle guard. Go another 1.05 miles to the Briggs Hollow turnoff. Stay right for 0.35 miles, turn right off the Mytoge Road, and go 0.3 miles. Before the gate turn right and follow the fence line 0.2 miles to another gate. Drive another 0.85 miles (passing through two more gates) to a half high witness post among some rocks. Walk 11 paces off the left (west) side of the road. From the witness post, the white-topped 0 foot baseline stake is 7 paces away at an azimuth of 284°magnetic.

**Site Information**

Land Ownership USFS  
 Allotment Seven Mile  
 Elevation 9,400ft (2,865m)  
 Aspect South  
 Slope 10-12%  
 Sample Dates 06/17/1991, 08/25/1999, 08/26/2004, 08/20/2009, 08/12/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 13

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Prescribed Fire	-	-	1989 or 1990	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer; Elk, Substantial Winter; Pronghorn, Crucial Winter; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 25A, Study no: 13

Year	Vegetation Type <sup>1</sup>
1991	Perennial Grass
1999-2013	Low Rabbitbrush

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Elk presence has been high in this area from 1999 through 2013, while deer and cattle presence has remained low (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 23 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site High Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB516UT

**SOIL ANALYSIS DATA--**

Management unit 25A, Study no: 13

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	33.3	43.4	23.3	7.3	0.7	5.2	20.5	428.8	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [High Mountain Loam \(Mountain Big Sagebrush\), R047XA516UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Following the prescribed burn in 1989 or 1990 this site was dominated by perennial native grasses and a wide diversity of perennial forbs (Appendix - 1992 Data). Stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) was the dominant browse species, though the majority of the plants were still young and low growing. Shrub cover and diversity have increased over the sample years; however, stickyleaf low rabbitbrush

has remained the dominant shrub species (Table - Browse Characteristics, Table - Browse Trends). The herbaceous understory has decreased in cover over the same years (Table Herbaceous Trends). As the length of time elapsed since last fire increases, the mountain big sagebrush (*Artemisia tridentata ssp. wyomingensis*) and snowberry (*Symphoricarposoreophilus*) will slowly return to dominate the site while the understory diminishes (USDA-NRCS, 2011).

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 25A, Study no: 13

T y p e	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron smithii	a54	ab78	b104	b82	.72	1.27	.42	1.41
G	Agropyron spicatum	b91	b91	b101	a34	2.27	4.12	2.69	1.08
G	Bromus anomalus	c40	ab1	a-	b18	.60	.00	-	.10
G	Carex obtusata	c107	ab18	a3	b43	2.68	.25	.07	1.16
G	Koeleria cristata	b142	a42	a16	b90	2.82	.84	.10	1.72
G	Poa fendleriana	b318	a238	a255	ab284	10.57	6.57	4.54	9.14
G	Sitanion hystrix	c107	b61	a21	ab35	1.87	1.12	.25	1.23
G	Sporobolus cryptandrus	1	-	-	-	.03	-	-	-
G	Stipa comata	ab5	ab8	a-	b16	.03	.06	-	.13
G	Stipa pinetorum	a73	a72	ab103	b123	1.82	2.01	2.83	3.67
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		938	609	603	725	23.44	16.27	10.92	19.68
Total for Grasses		938	609	603	725	23.44	16.27	10.92	19.68
F	Agoseris glauca	-	4	7	1	-	.03	.04	.00
F	Androsace septentrionalis (a)	c88	a-	a-	b35	.44	-	-	.08
F	Antennaria sp.	b140	a78	a66	a96	5.08	.99	1.47	2.14
F	Arabis drummondii	-	-	-	1	-	-	-	.00
F	Aster chilensis	c56	b34	a-	bc50	1.57	.22	-	.94
F	Astragalus argophyllus	a-	b14	a-	a-	-	.13	-	-
F	Astragalus serpens	-	-	-	5	-	-	-	.01
F	Astragalus sp.	b41	a-	a-	a-	.22	-	-	-
F	Astragalus tenellus	a-	a3	b17	b16	-	.03	.06	.10
F	Castilleja linariaefolia	7	2	-	1	.07	.00	-	.03
F	Chenopodium album (a)	-	13	5	-	-	.09	.00	-
F	Chenopodium leptophyllum(a)	a-	b37	b23	a4	-	.23	.05	.01
F	Comandra pallida	a-	a7	b37	a-	-	.01	.19	-
F	Crepis acuminata	5	-	-	5	.02	-	-	.01
F	Erigeron eatonii	a-	bc18	c27	b10	-	.08	.33	.02
F	Erigeron flagellaris	-	-	3	4	-	-	.03	.06
F	Erigeron pumilus	ab9	ab4	b18	a1	.09	.01	.10	.00
F	Eriogonum racemosum	ab77	a65	a65	b98	1.66	1.62	.82	1.78
F	Eriogonum umbellatum	6	2	9	11	.08	.04	.12	.16
F	Gayophytum ramosissimum(a)	a-	b21	b10	a-	-	.06	.02	-
F	Lappula occidentalis (a)	-	5	-	-	-	.01	-	-
F	Lotus utahensis	b28	a5	a8	a8	.50	.07	.02	.07

T y P e	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	Lupinus argenteus	b <sup>1</sup> 15	a <sup>5</sup>	a <sup>3</sup>	a <sup>2</sup>	3.48	.04	.03	.00
F	Lychnis drummondii	b <sup>1</sup> 0	ab <sup>5</sup>	a <sup>-</sup>	ab <sup>2</sup>	.07	.01	-	.01
F	Machaeranthera canescens	a <sup>2</sup>	a <sup>-</sup>	a <sup>1</sup>	b <sup>1</sup> 5	.03	-	.00	.06
F	Penstemon watsonii	b <sup>7</sup> 0	ab <sup>5</sup> 9	a <sup>3</sup> 6	a <sup>3</sup> 0	1.89	1.73	.43	.33
F	Phlox austromontana	-	3	1	-	-	.03	.00	-
F	Phlox longifolia	a <sup>-</sup>	ab <sup>8</sup>	ab <sup>8</sup>	b <sup>1</sup> 1	-	.07	.01	.03
F	Potentilla hippiana	9	5	-	-	.33	.07	-	-
F	Taraxacum officinale	c <sup>8</sup> 3	ab <sup>3</sup>	a <sup>-</sup>	b <sup>1</sup> 1	1.31	.03	-	.05
F	Tragopogon dubius (a)	1	-	-	-	.03	-	-	-
F	Viguiera multiflora	1	-	-	-	.00	-	-	-
Total for Annual Forbs		89	76	38	39	0.47	0.40	0.08	0.09
Total for Perennial Forbs		659	324	306	378	16.43	5.25	3.71	5.87
Total for Forbs		748	400	344	417	16.91	5.66	3.80	5.97

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 13

T y P e	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia tridentata vaseyana	-	.60	.91	1.34	.55	1.40	1.95
B	Chrysothamnus parryi	.87	1.69	1.42	1.01	1.36	2.70	1.06
B	Chrysothamnus viscidiflorus viscidiflorus	13.89	20.17	13.79	11.03	24.70	14.93	13.70
B	Mahonia repens	.06	.15	.15	.06	.05	-	-
B	Rosa woodsii	.09	.03	.06	.15	-	-	.05
B	Symphoricarpos oreophilus	1.01	1.27	1.56	1.39	1.71	2.15	3.11
Total for Browse		15.93	23.93	17.91	15.00	28.37	21.18	19.87

#### BASIC COVER--

Management unit 25A, Study no: 13

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	56.81	44.18	36.28	45.02
Rock	5.76	7.89	3.42	17.42
Pavement	12.86	24.80	23.12	22.39
Litter	35.66	25.22	33.93	27.27
Cryptogams	0	.03	0	.15
Bare Ground	9.22	9.74	11.45	4.63

PELLET GROUP DATA--

Management unit 25A, Study no: 13

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	4	6	49	10	-	-	-	-
Horse	1	-	-	-	-	-	-	-
Elk	57	61	60	39	97 (240)	112 (276)	91 (225)	105 (259)
Deer	7	3	7	5	9 (22)	5 (13)	11 (26)	10 (24)
Cattle	8	1	5	5	25 (62)	-	14 (34)	32 (78)

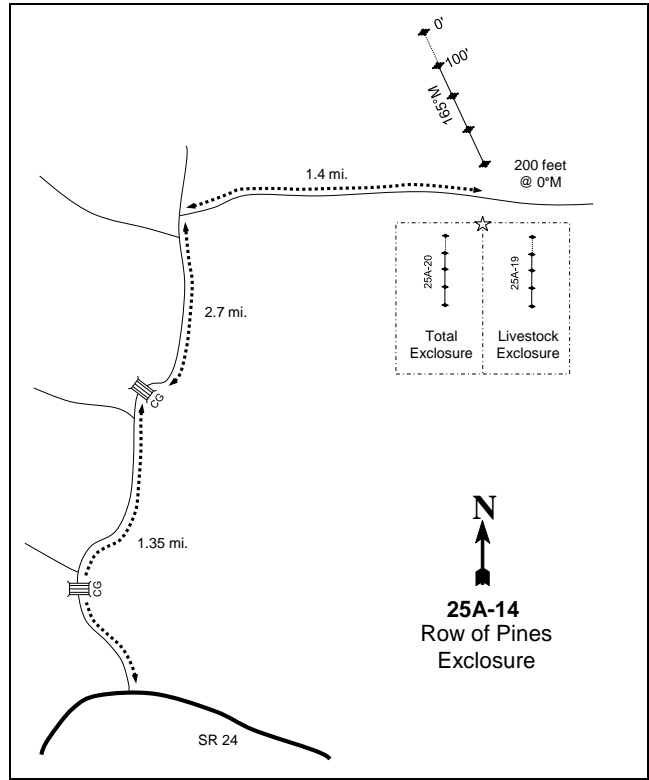
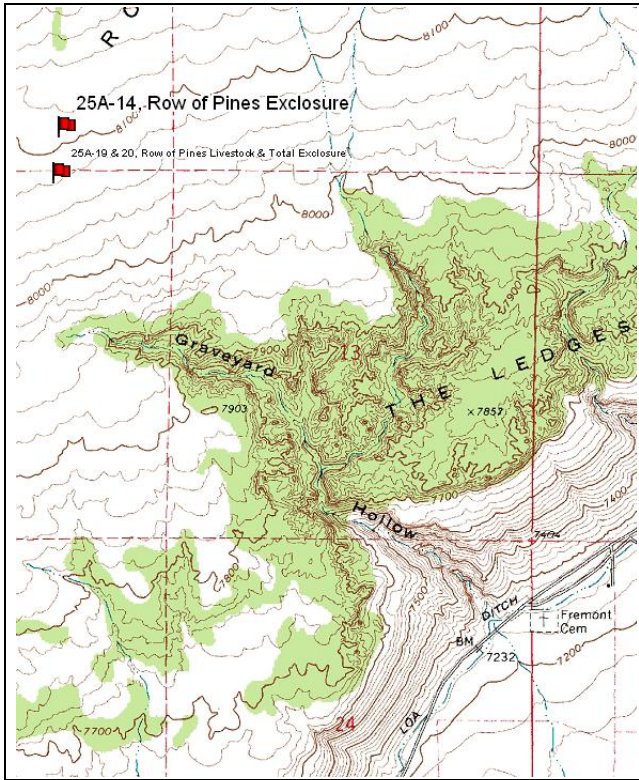
BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 13

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Amelanchier utahensis</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	20	0	100	-	-	0	100	0	8/13
13	0	0	0	-	-	0	0	0	-/-
<i>Artemisia frigida</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	14/15
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	4/9
<i>Artemisia tridentata vaseyana</i>									
99	160	50	50	0	-	0	0	0	22/38
04	260	46	54	0	3140	38	0	0	14/20
09	1580	51	49	0	460	6	1	0	10/15
13	1160	55	43	2	80	10	19	3	14/25
<i>Chrysothamnus parryi</i>									
99	960	0	100	0	-	4	0	0	9/14
04	1740	1	99	0	-	2	0	0	8/12
09	1520	8	86	7	-	0	4	11	7/12
13	1180	2	98	0	-	0	0	0	7/11
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	7240	13	86	2	-	0	0	1	13/21
04	10520	9	90	1	8740	.19	0	.57	11/19
09	13800	20	48	32	940	0	0	37	8/16
13	10380	27	71	1	540	23	7	9	8/16
<i>Cowania mexicana stansburiana</i>									
99	0	0	0	-	-	0	0	0	9/17
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Mahonia repens</b>										
99	<b>260</b>	38	62	-	-	0	0	0	3/6	
04	<b>900</b>	24	76	-	-	0	0	0	4/3	
09	<b>160</b>	0	100	-	-	0	0	0	3/2	
13	<b>860</b>	0	100	-	-	0	0	0	4/3	
<b>Rosa woodsii</b>										
99	<b>260</b>	31	69	0	-	0	0	0	9/9	
04	<b>220</b>	36	45	18	-	0	0	18	6/4	
09	<b>320</b>	25	75	0	20	0	0	0	7/4	
13	<b>140</b>	14	86	0	-	14	71	14	11/10	
<b>Symphoricarpos oreophilus</b>										
99	<b>440</b>	27	68	5	-	0	0	0	19/32	
04	<b>360</b>	6	83	11	-	6	6	11	15/26	
09	<b>460</b>	9	91	0	-	9	30	22	15/28	
13	<b>360</b>	11	83	6	60	33	39	33	17/36	
<b>Tetradymia canescens</b>										
99	<b>0</b>	0	0	-	-	0	0	0	-/-	
04	<b>0</b>	0	0	-	-	0	0	0	10/15	
09	<b>0</b>	0	0	-	-	0	0	0	5/8	
13	<b>0</b>	0	0	-	-	0	0	0	8/12	

ROW OF PINES ENCLOSURE - TREND STUDY NO. 25A-14



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Loa; Township 27S, Range 2E, Section 11  
NAD 83, UTM Zone 12, 442669 East 4258250 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
165° magnetic  
400ft  
Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Standard

**Directions to Site**

From the Chappell Cheese Factory northwest of Loa on SR 24, go west 2.6 miles to a side road on the north where the highway makes a sharp turn (0.95 miles west of mile marker #49). Take this road 0.65 miles and turn right after crossing a cattleguard. After 0.7 more miles, turn right at the fork and cross another cattleguard. Go 2.7 miles to another fork where you will again turn right. After about 60', turn right (east) and go 1.4 miles to an enclosure. Stop at the middle of the enclosure and walk 200 feet at an azimuth of 0° magnetic to the 400' stake. The 0' stake is 400 feet to the north in front of a large rock.



**Site Information**

Land Ownership BLM  
 Allotment Seven Mile  
 Elevation 8,050ft (2,454m)  
 Aspect Southeast  
 Slope 3-5%  
 Sample Dates 06/14/1991, 08/24/1999, 08/11/2004, 08/13/2009, 08/15/2013

**DISTURBANCE HISTORY--**

Management unit 25A, Study no: 14

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining	-	-	Late 1980's	-
Seeding	-	-	Late 1980's	-
Harrow (2-Way Dixie)	Seven Mile-North Mountain Dixie Harrow	<a href="#">594</a>	Fall 2006	1650
Seeding (Broadcast Before)	Seven Mile-North Mountain Dixie Harrow	<a href="#">594</a>	Fall 2006	1650

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 25A, Study no: 14

Project Name: Seven Mile - Low elevation			
WRI Database #: <a href="#">594</a>			
Application: Broadcast		Acres: 4400	
Seed type		lbs in mix	lbs/acre
G	Big Bluegrass 'Sherman'	1169	0.27
G	Crested Wheatgrass 'Ephraim'	2200	0.50
G	Crested Wheatgrass 'Hycrest'	2220	0.50
G	Great Basin Wildrye 'Trailhead'	3535	0.80
G	Pubescent Wheatgrass	2200	0.50
G	Russian Wildrye	4420	1.00
G	Sandberg Bluegrass 'Toole MT'	1094	0.25
G	Sheep Fescue	1100	0.25
F	Alfalfa 'Ladak'	2200	0.50
F	Annual Sunflower	140	0.03
F	Blue Flax	533	0.12
F	Blue Flax 'Appar'	900	0.20
F	Small Burnet 'Delar'	8800	2.00
F	Yellow Sweetclover	1100	0.25
G	Big Bluegrass 'Sherman'	1169	0.27
Total Pounds		31611	7.18
PLS Pounds:		28468	6.47

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Crucial Winter; Sage-Grouse, Habitat Winter, Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 25A, Study no: 14

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-2004	Wyoming Big Sagebrush	No Encroachment
2009-2013	Perennial Grass/Wyoming Big Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Large amounts of sage grouse droppings were encountered in the area during site establishment in 1991. Deer presence was high in 2004, but was low in all other sample years (Table - Pellet Group Data). Escape cover is about half mile from the study transect.

**Site Potential**

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

**SOIL ANALYSIS DATA--**

Management unit 25A, Study no: 14

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	47.3	27.4	25.3	7.0	0.6	1.6	8.5	163.2	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1991, the site was a mixed stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and broom snakeweed (*Gutierrezia sarothrae*). The herbaceous understory consisted of a mixture of native and introduced perennial grasses and a few low cover forbs (Appendix B -Pre-1992 Data). Since the harrow treatment in fall 2006, both native and introduced grasses have increased in cover while shrubs and forbs decreased in cover in 2009 with a subsequent rebound in 2013 (Table - Herbaceous Trends, Table - Browse Trends). Since 2004, the age class distribution of Wyoming big sagebrush has diversified and recruitment of young has increased, while sagebrush has steadily increased in abundance (Table - Browse Characteristics). With time, the community will likely transition to a Wyoming big sagebrush dominated site.

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 25A, study no: 14

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	16.4	6.3	3.0	17.7	0.0	1.2	0.0	<b>44.6</b>	Fair-Good
2004	13.9	2.4	1.0	11.4	0.0	0.4	0.0	<b>29.2</b>	Fair
2009	2.8	0.0	0.0	20.7	0.0	0.1	0.0	<b>23.6</b>	Poor-Fair
2013	10.9	14.1	10.0	30.0	0.0	0.4	0.0	<b>65.3</b>	Good-Excellent

**HERBACEOUS TRENDS--**

Management unit 25A, Study no: 14

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	b37	a8	a2	a13	.22	.06	.01	.25
G	Bouteloua gracilis	a169	a176	a167	b252	6.48	4.83	9.14	15.17
G	Bromus inermis	9	4	-	-	.07	.03	-	-

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	<i>Elymus junceus</i>	<sub>a</sub> 20	<sub>a</sub> 10	<sub>a</sub> 23	<sub>b</sub> 81	.18	.21	.29	3.17
G	<i>Oryzopsis hymenoides</i>	19	19	31	26	.11	.10	.50	.63
G	<i>Poa secunda</i>	-	-	-	3	-	-	-	.00
G	<i>Sitanion hystrix</i>	<sub>b</sub> 163	<sub>a</sub> 48	<sub>a</sub> 42	<sub>a</sub> 42	1.73	.46	.41	.97
G	<i>Stipa comata</i>	1	-	-	2	.00	-	-	.03
G	<i>Stipa lettermani</i>	-	-	-	8	-	-	-	.21
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		418	265	265	427	8.83	5.70	10.36	20.44
Total for Grasses		418	265	265	427	8.83	5.70	10.36	20.44
F	<i>Androsace septentrionalis</i> (a)	<sub>b</sub> 12	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.02	-	-	-
F	<i>Arabis demissa</i>	-	3	2	4	-	.15	.00	.00
F	<i>Astragalus lentiginosus</i>	<sub>ab</sub> 6	<sub>b</sub> 17	<sub>a</sub> 2	<sub>a</sub> -	.01	.03	.00	-
F	<i>Chenopodium fremontii</i> (a)	-	2	-	-	-	.15	-	-
F	<i>Chenopodium leptophyllum</i> (a)	-	4	-	-	-	.03	-	-
F	<i>Descurainia pinnata</i> (a)	4	5	14	2	.01	.04	.08	.00
F	<i>Erigeron pumilus</i>	<sub>c</sub> 67	<sub>a</sub> -	<sub>ab</sub> 6	<sub>b</sub> 19	.38	-	.02	.15
F	<i>Eriogonum ovalifolium</i>	3	-	-	1	.18	-	-	.00
F	<i>Phlox longifolia</i>	5	4	-	1	.01	.01	-	.00
F	<i>Sphaeralcea coccinea</i>	5	4	3	9	.02	.01	.01	.02
Total for Annual Forbs		16	11	14	2	0.03	0.22	0.08	0.00
Total for Perennial Forbs		86	28	13	34	0.61	0.21	0.04	0.18
Total for Forbs		102	39	27	36	0.65	0.43	0.12	0.19

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 14

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia frigida</i>	-	-	.03	.03	-	-	-
B	<i>Artemisia tridentata wyomingensis</i>	13.11	11.15	2.21	8.68	9.55	4.28	9.30
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	.45	.47	.06	.36	.41	.05	.18
B	<i>Gutierrezia sarothrae</i>	3.20	.27	2.65	.58	.71	2.60	.16
B	<i>Opuntia fragilis</i>	.19	.06	.00	-	.08	-	-
B	<i>Opuntia sp.</i>	-	-	-	.10	-	-	-
Total for Browse		16.96	11.96	4.97	9.76	10.75	6.93	9.64

BASIC COVER--

Management unit 25A, Study no: 14

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	25.66	18.32	17.33	29.45
Rock	13.64	13.12	14.96	15.94
Pavement	29.29	26.68	16.49	25.70
Litter	18.03	21.06	24.18	22.70
Cryptogams	.24	.13	.01	.00
Bare Ground	21.60	34.99	31.70	20.25

PELLET GROUP DATA--

Management unit 25A, Study no: 14

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	34	45	65	18	-	-	-	-
Grouse	-	2	-	-	-	-	-	-
Elk	5	3	-	1	15 (37)	3 (7)	-	2 (5)
Deer	16	29	10	10	29 (72)	77 (190)	27 (68)	9 (22)
Cattle	3	4	1	2	15 (37)	4 (11)	5 (13)	7 (18)
Antelope	-	-	1	-	-	-	-	-

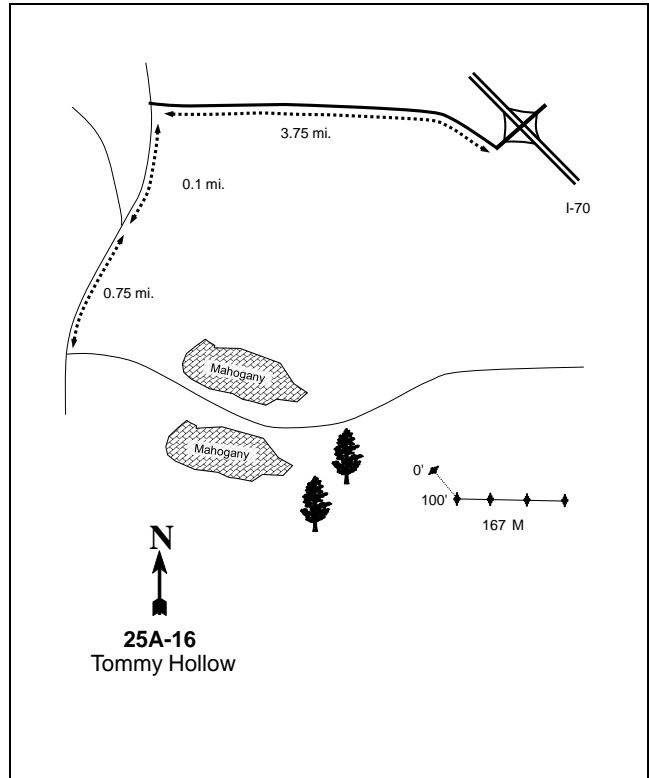
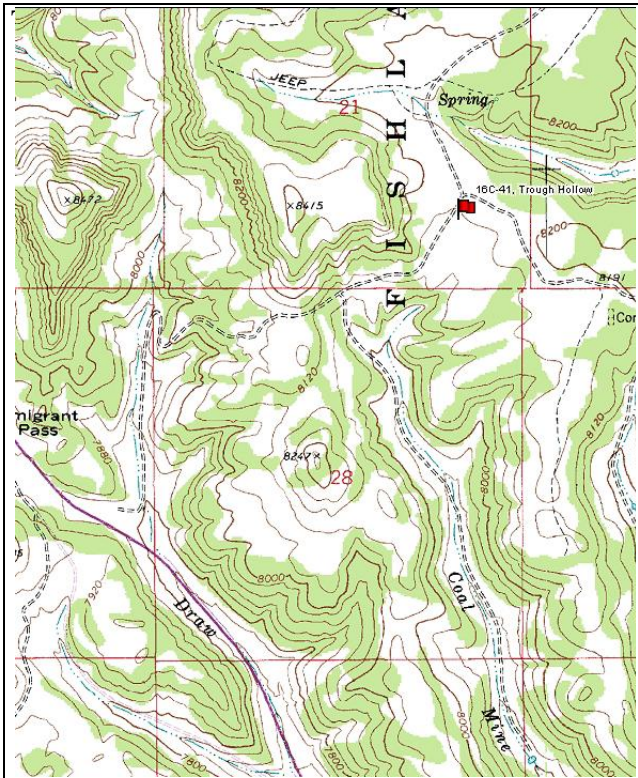
BROWSE CHARACTERISTICS--

Management unit 25A, Study no: 14

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia frigida</i>									
99	<b>200</b>	10	90	-	-	20	40	0	4/6
04	<b>60</b>	0	100	-	-	0	67	0	3/3
09	<b>20</b>	0	100	-	-	0	0	0	6/6
13	<b>20</b>	0	100	-	-	0	0	0	6/16
<i>Artemisia tridentata wyomingensis</i>									
99	<b>5580</b>	6	65	29	60	45	17	14	13/24
04	<b>4780</b>	2	56	42	360	44	22	19	13/25
09	<b>6640</b>	38	56	6	440	7	0	7	8/11
13	<b>7020</b>	20	77	3	9460	39	.28	14	11/17
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
99	<b>1100</b>	2	75	24	-	7	0	9	4/9
04	<b>1060</b>	6	85	9	60	8	0	6	5/11
09	<b>160</b>	0	100	0	-	25	0	0	5/7
13	<b>380</b>	5	74	21	-	11	5	37	5/8

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>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	-/-
<i>Eriogonum microthecum</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	4/6
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
99	10000	10	88	2	520	0	0	1	7/8
04	1420	1	99	0	-	0	0	0	5/8
09	8640	8	92	0	40	0	1	.23	6/7
13	1920	30	56	14	1860	5	1	16	4/6
<i>Opuntia fragilis</i>									
99	540	7	89	4	-	0	0	4	2/8
04	720	6	94	0	-	0	0	0	2/7
09	20	0	100	0	20	0	0	0	2/5
13	0	0	0	0	-	0	0	0	-/-
<i>Opuntia sp.</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	220	45	55	-	20	0	0	18	2/8
<i>Pediocactus simpsonii</i>									
99	20	100	0	-	-	0	0	0	-/-
04	40	0	100	-	-	0	0	0	1/2
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	80	0	100	-	-	0	0	0	-/-

TOMMY HOLLOW - TREND STUDY NO. 25A-16



**Location Information**

USGS 7.5 min Map Info Old Woman Plateau; Township 23S, Range 4E, Section 32  
 GPS (0' Stake) NAD 83, UTM Zone 12, 457783 East 4290680 North

**Transect Information**

Browse Tag # (0' Stake) 7193  
 Transect Bearing 167° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Take I-70 east for about 37.5 miles from Salina to a rest area exit. From the exit, turn right once, then right again to go west on the frontage road paralleling the freeway. Drive on the frontage road for 3.75 miles to a road (FS #013) turning left. Take this left turn and proceed 0.1 miles to a "T" in the road, turn left again and go south for 0.75 miles to the crest of the second hill. On the crest there is an old jeep trail turning left and going down the top of the hill. This road goes through a small clearing at the intersection, then through a thick patch of mahogany and junipers. The transect begins in the next sagebrush clearing beyond the trees, about 50 feet past two pinyons standing beside each other near the edge of the clearing. The transect is marked with 2-1/2 foot tall rebar. The 0-foot baseline stake has a red browse tag #7193 attached.

### Site Information

Land Ownership USFS  
 Allotment Beaver Dams  
 Elevation 7,800ft (2,377m)  
 Aspect Northeast  
 Slope 1-2%  
 Sample Dates 07/07/1985, 06/28/1991, 08/17/1999, 08/25/2004, 08/10/2009, 08/21/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter

#### VEGETATION HISTORY--

Management unit 25A, Study no: 16

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Mountain Big Sagebrush/Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Elk and deer presence was high in 1999, but low to moderate all other sample years (Table - Pellet Group Data). Both mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and black sagebrush (*Artemisia nova*) received moderate to heavy use in 2013.

### Site Potential

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

#### SOIL ANALYSIS DATA--

Management unit 25A, Study no: 16

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	52.9	15.8	31.3	6.5	0.6	1.6	4.1	163.2	0.6

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

Since established in 1985, the site has remained a mixed stand of mountain big sagebrush and black sagebrush, with a diverse component of other shrub species present that have provided limited cover. Native and introduced perennial grass species made up the majority of the herbaceous understory with limited cover provided by native perennial forbs (Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have begun to encroach on the area, and without a tree-removing disturbance, the community is at risk of transitioning to a pinyon and juniper dominated community (Table - Point-Quarter Tree Data).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25A, study no: 16

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	26.5	8.8	13.5	24.8	0.0	7.9	0.0	<b>81.5</b>	Good-Excellent
2004	27.9	6.4	3.0	26.1	0.0	2.9	0.0	<b>66.2</b>	Fair-Good
2009	27.4	8.7	2.2	21.3	0.0	5.5	0.0	<b>65.1</b>	Fair-Good
2013	28.1	9.0	4.8	28.4	0.0	4.8	0.0	<b>75.1</b>	Good

## HERBACEOUS TRENDS--

Management unit 25A, Study no: 16

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron smithii	b122	ab99	ab96	a77	1.16	1.09	1.24	1.00
G	Bouteloua gracilis	b100	a54	a33	ab73	1.48	1.08	.54	2.08
G	Bromus tectorum (a)	2	-	-	-	.00	-	-	-
G	Carex sp.	a29	c173	b83	c221	.69	1.56	.40	3.12
G	Festuca ovina	b67	a4	a-	a4	.84	.06	-	.09
G	Oryzopsis hymenoides	4	-	-	7	.01	-	-	.06
G	Poa fendleriana	a194	b251	b290	b259	4.87	6.17	7.28	6.25
G	Poa pratensis	a-	ab10	a-	b17	-	.12	-	.18
G	Poa secunda	2	19	19	20	.00	.06	.11	.39
G	Sitanion hystrix	c126	b76	a21	a37	2.10	2.15	.19	.42
G	Stipa comata	5	-	-	7	.07	.00	-	.12
G	Stipa lettermani	58	50	47	36	1.18	.71	.89	.46
Total for Annual Grasses		2	0	0	0	0.00	0	0	0
Total for Perennial Grasses		707	736	589	758	12.42	13.03	10.67	14.20
Total for Grasses		709	736	589	758	12.43	13.03	10.67	14.20
F	Allium sp.	2	-	-	3	.03	-	-	.00
F	Androsace septentrionalis (a)	b28	b20	a1	a1	.07	.08	.00	.00
F	Antennaria sp.	b32	ab17	a8	b27	2.40	.20	.21	.41
F	Arabis demissa	a13	a2	a8	b43	.03	.00	.03	.18
F	Astragalus convallarius	1	7	1	1	.03	.03	.00	.00
F	Astragalus sp.	9	4	3	1	.22	.03	.00	.00
F	Astragalus utahensis	-	2	-	-	-	.00	-	-
F	Calochortus nuttallii	6	-	-	3	.01	-	-	.00
F	Castilleja chromosa	3	-	2	-	.01	-	.00	-
F	Collinsia parviflora (a)	a-	a6	b28	a4	-	.01	.06	.00
F	Descurainia pinnata (a)	-	1	-	-	-	.00	-	-
F	Erigeron eatonii	15	23	26	37	.08	.09	.30	.11
F	Erigeron flagellaris	a-	a4	b30	a-	-	.01	.32	-
F	Erigeron pumilus	14	13	18	15	.03	.09	.09	.10
F	Eriogonum alatum	-	-	-	2	-	-	-	.00



Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	Eriogonum racemosum	13	10	23	24	.13	.13	.52	.22
F	Hymenoxys richardsonii	13	18	20	6	.18	.18	.33	.21
F	Ipomopsis aggregata	3	-	-	-	.03	-	-	-
F	Lychnis drummondii	-	-	-	3	-	-	-	.03
F	Machaeranthera canescens	2	-	-	5	.01	-	-	.00
F	Microsteris gracilis (a)	-	3	6	-	-	.01	.01	-
F	Penstemon comarrhenus	-	3	5	3	-	.01	.04	.01
F	Penstemon pachyphyllus	2	-	-	-	.06	-	-	-
F	Penstemon sp.	ab8	ab5	b14	a-	.07	.06	.27	-
F	Penstemon watsonii	a-	a-	a-	b9	-	-	-	.20
F	Phlox austromontana	23	11	15	16	.22	.22	.30	.61
F	Phlox longifolia	-	3	3	3	-	.00	.01	.00
F	Polygonum douglasii (a)	11	26	21	18	.02	.05	.06	.03
F	Potentilla gracilis	3	-	-	-	.00	-	-	-
F	Ranunculus testiculatus (a)	a-	a6	b124	a2	-	.01	.55	.00
F	Sphaeralcea coccinea	a36	ab48	b63	ab51	.34	.37	.26	.25
F	Taraxacum officinale	4	3	-	-	.01	.01	-	-
F	Unknown forb-perennial	2	-	-	-	.00	-	-	-
F	Zigadenus paniculatus	-	-	2	2	-	-	.00	.00
Total for Annual Forbs		39	62	180	25	0.09	0.17	0.70	0.05
Total for Perennial Forbs		204	173	241	254	3.94	1.47	2.74	2.40
Total for Forbs		243	235	421	279	4.04	1.64	3.44	2.45

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 16

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Amelanchier utahensis	.38	.41	-	.06	.63	.06	-
B	Artemisia frigida	-	-	.15	-	-	-	-
B	Artemisia nova	3.59	6.27	5.62	8.25	11.01	7.66	9.20
B	Artemisia tridentata tridentata	.15	.66	.15	.77	1.26	.36	1.63
B	Artemisia tridentata vaseyana	13.40	10.92	8.73	7.38	14.74	9.16	6.35
B	Ceratoides lanata	.00	.07	.09	.10	-	.03	.10
B	Cercocarpus ledifolius	.00	-	-	-	-	-	-
B	Chrysothamnus depressus	.03	.09	1.27	.03	-	1.85	.25
B	Chrysothamnus viscidiflorus viscidiflorus	5.66	7.72	2.60	5.60	13.63	4.13	6.13
B	Echinocereus triglochidatus	.00	-	-	-	-	-	-
B	Gutierrezia sarothrae	.93	1.83	.23	.11	3.00	.23	.10
B	Juniperus osteosperma	-	.00	-	-	-	-	-
B	Juniperus scopulorum	-	-	-	.38	-	-	-
B	Opuntia sp.	.26	.42	.35	.50	.15	.06	.01

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Pediocactus simpsonii</i>	-	-	-	.03	-	-	.05
B	<i>Pinus edulis</i>	-	.03	.81	.56	.06	.60	.30
B	<i>Purshia tridentata</i>	2.97	3.17	5.02	4.88	1.91	7.64	6.66
B	<i>Symphoricarpos oreophilus</i>	.21	.00	.15	.18	.13	.58	.75
B	<i>Tetradymia canescens</i>	-	.00	.00	-	.05	.03	-
Total for Browse		27.61	31.63	25.19	28.87	2.15	32.39	31.53

POINT-QUARTER TREE DATA--  
Management unit 25A, Study no: 16

Species	Trees per Acre				Average diameter (in)			
	'99	'04	'09	'13	'99	'04	'09	'13
<i>Juniperus osteosperma</i>	6	<18	<18	20	6.5	-	-	4.8
<i>Pinus edulis</i>	12	<18	<18	29	4.7	-	-	2.6
<i>Juniperus scopulorum</i>	-	-	-	32	-	-	-	3.8

BASIC COVER--  
Management unit 25A, Study no: 16

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	45.81	44.76	39.38	48.21
Rock	.04	.05	.01	.64
Pavement	.53	2.88	.77	.98
Litter	36.16	38.03	44.74	50.24
Cryptogams	6.70	9.33	5.21	4.32
Bare Ground	27.71	25.63	26.80	23.75

PELLET GROUP DATA--  
Management unit 25A, Study no: 16

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	67	65	63	33	-	-	-	-
Elk	32	17	12	23	93 (229)	13 (33)	34 (83)	34 (84)
Deer	15	21	4	12	96 (237)	12 (30)	5 (13)	9 (21)
Cattle	3	3	3	-	9 (22)	9 (21)	8 (20)	3 (7)

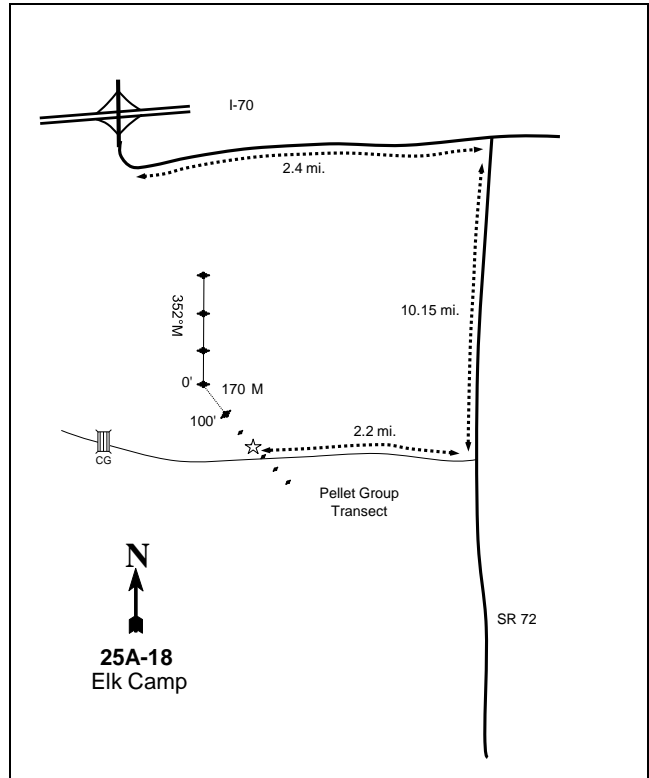
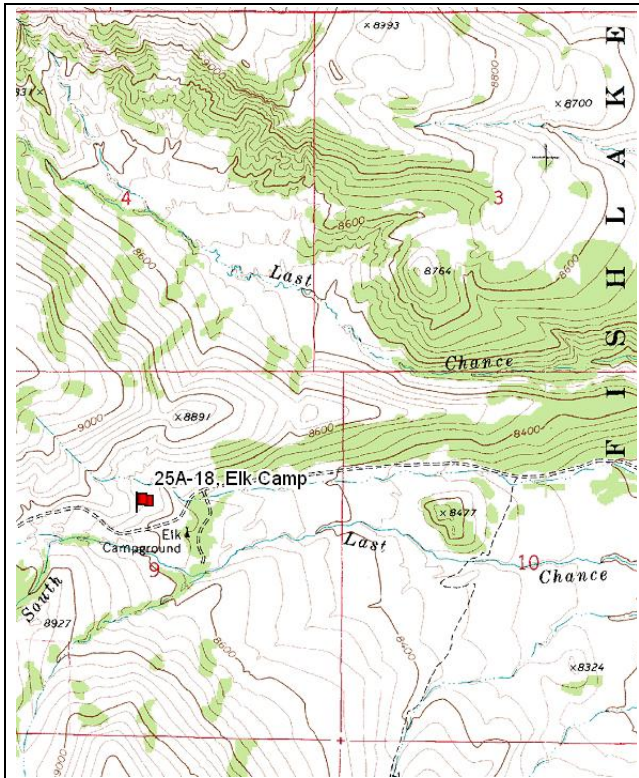
BROWSE CHARACTERISTICS--  
Management unit 25A, Study no: 16

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
99	100	40	60	-	-	40	40	0	38/29	
04	120	50	50	-	20	33	33	0	15/15	
09	60	0	100	-	-	67	33	0	11/13	
13	60	100	0	-	-	0	33	0	20/24	
<i>Artemisia frigida</i>										
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	120	0	100	-	-	100	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Artemisia nova</i>										
99	7800	24	67	9	140	17	.25	4	9/16	
04	6280	1	82	17	100	0	0	6	8/17	
09	8100	4	75	21	700	16	2	13	6/14	
13	6520	8	85	7	80	48	36	41	7/16	
<i>Artemisia tridentata tridentata</i>										
99	20	0	0	100	-	0	0	0	-/-	
04	40	0	0	100	-	0	0	50	69/69	
09	20	0	0	100	-	100	0	100	52/67	
13	580	48	38	14	80	3	0	10	32/33	
<i>Artemisia tridentata vaseyana</i>										
99	6880	29	51	21	260	31	.29	3	21/32	
04	4340	7	56	37	180	29	26	24	18/28	
09	4880	8	57	35	280	41	6	25	19/25	
13	2620	11	52	37	60	47	38	37	20/29	
<i>Ceratoides lanata</i>										
99	220	0	91	9	20	27	73	0	3/3	
04	360	6	94	0	-	50	44	6	4/3	
09	360	6	94	0	-	0	0	0	3/4	
13	400	15	85	0	20	5	25	0	3/5	
<i>Cercocarpus ledifolius</i>										
99	0	0	0	-	20	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	34/44	
09	0	0	0	-	-	0	0	0	47/35	
13	0	0	0	-	-	0	0	0	59/41	
<i>Chrysothamnus depressus</i>										
99	180	0	100	-	-	33	33	0	3/5	
04	400	25	75	-	-	0	25	0	4/8	
09	2500	0	100	-	-	32	0	0	3/7	
13	220	0	100	-	-	0	36	0	3/9	

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>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	<b>12580</b>	3	95	2	-	.31	0	0	4/9
04	<b>7120</b>	1	98	1	360	0	0	.28	5/10
09	<b>7680</b>	10	89	1	-	0	0	2	5/9
13	<b>7860</b>	5	95	0	20	36	28	.76	4/10
<i>Echinocereus triglochidatus</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>20</b>	0	100	-	-	0	0	0	2/3
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
99	<b>5780</b>	14	86	-	40	0	0	0	6/7
04	<b>2060</b>	0	100	-	-	0	0	0	6/8
09	<b>1360</b>	0	100	-	-	0	12	0	4/5
13	<b>520</b>	4	96	-	80	0	0	0	6/8
<i>Juniperus osteosperma</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>20</b>	100	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Juniperus scopulorum</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>40</b>	50	50	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
99	<b>580</b>	28	66	7	-	0	0	7	3/12
04	<b>920</b>	2	98	0	-	0	0	0	2/7
09	<b>700</b>	31	69	0	20	0	0	0	2/8
13	<b>600</b>	30	70	0	20	0	0	13	2/7
<i>Pediocactus simpsonii</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>40</b>	50	50	-	-	0	0	0	2/3
<i>Pinus edulis</i>									
99	<b>40</b>	100	0	0	20	0	0	0	-/-
04	<b>60</b>	67	0	33	-	0	0	0	-/-
09	<b>60</b>	100	0	0	-	0	0	0	-/-
13	<b>60</b>	100	0	0	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Purshia tridentata</i>										
99	<b>180</b>	22	44	33	-	33	33	0	20/48	
04	<b>280</b>	7	79	14	20	0	93	7	16/44	
09	<b>800</b>	0	100	0	-	0	10	3	22/38	
13	<b>780</b>	3	79	18	-	36	62	18	23/48	
<i>Symphoricarpos oreophilus</i>										
99	<b>120</b>	33	67	0	-	0	0	0	14/27	
04	<b>100</b>	40	40	20	-	20	0	0	9/14	
09	<b>80</b>	0	100	0	-	0	0	0	13/21	
13	<b>100</b>	0	100	0	-	60	0	0	20/48	
<i>Tetradymia canescens</i>										
99	<b>60</b>	67	33	-	-	0	33	0	12/15	
04	<b>160</b>	88	13	-	-	0	0	0	3/8	
09	<b>100</b>	0	100	-	-	0	0	0	5/7	
13	<b>0</b>	0	0	-	-	0	0	0	7/11	

ELK CAMP - TREND STUDY NO. 25A-18



**Location Information**

USGS 7.5 min Map Info      Johns Peak; Township 25S, Range 4E, Section 9  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 458264 East 4278340 North

**Transect Information**

Browse Tag # (0' Stake)      7040  
 Transect Bearing              170° magnetic, 352 ° magnetic (Line 2-4)  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

Go east from Salina on I-70 for approximately 37.5 miles to the rest area. From the exit, go 2.4 miles east on the frontage road to the junction with SR 72. Travel south on SR 72 for 10.15 miles to a gravel road to the right with a sign for Last Chance Road. Turn and go 2 miles to the Elk Camp Road, and continue straight for another 0.2 miles. Stop here, approximately 90 yards short of a cattleguard, and look for a small yellow stake 10 feet off the south side of the road. The yellow pellet group transect stakes run northwest, with one stake every 30 feet. Follow the yellow stakes 90 feet up from the road to a large rebar which marks the 100-foot end of the frequency baseline. The 0-foot baseline stake is 100 feet north and is tagged #7040.

### Site Information

Land Ownership USFS  
 Allotment Last Chance  
 Elevation 8,700ft (2,652m)  
 Aspect South  
 Slope 10-30%  
 Sample Dates 07/16/1985, 06/12/1991, 08/18/1999, 08/23/2004, 08/20/2009, 08/13/2013

### DISTURBANCE HISTORY--

Management unit 25A, Study no: 18

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Prescribed Fire	-	-	1990	-

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Habitat Not Winter

### VEGETATION HISTORY--

Management unit 25A, Study no: 18

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

The prescribed fire was spotty and impacted only one of the belts. The surrounding hills are covered with scattered pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and patches of aspen (*Populus tremuloides*).

### Site Potential

1981-2010 Average Annual Precipitation 20 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

### SOIL ANALYSIS DATA--

Management unit 25A, Study no: 18

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	50.9	29.8	19.3	6.5	0.5	3.0	16.8	211.2	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

The site has remained in a stable mixed mountain brush community since the study was established in 1985. The study supports several mountain shrubs with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) being the dominant shrub species (Table - Browse Trends). The prescribed fire in 1990 was patchy and only affected one of the belts, so the shrubs and herbaceous understory were not widely impacted. The sparse herbaceous understory is composed largely of perennial native grasses and some perennial forbs (Table - Herbaceous Trends).

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 25A, Study no: 18

T y p e	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron smithii	a20	ab34	b56	ab40	.11	.25	.57	.46
G	Bouteloua gracilis	b108	ab73	a42	a66	3.65	2.12	.78	1.66
G	Carex sp.	ab117	c166	a118	bc161	3.25	2.18	1.17	2.93
G	Festuca ovina	9	3	-	-	.09	.15	-	-
G	Poa fendleriana	b223	a149	a165	a140	3.56	3.93	3.90	2.30
G	Poa pratensis	-	-	-	2	-	-	-	.03
G	Poa secunda	-	-	-	3	-	-	-	.03
G	Sitanion hystrix	b50	b35	a7	a10	.42	.59	.15	.10
G	Stipa comata	-	5	-	-	-	.07	-	-
G	Stipa lettermani	a50	ab67	ab58	b84	.90	1.95	1.18	1.25
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		577	532	446	506	12.00	11.26	7.78	8.77
Total for Grasses		577	532	446	506	12.00	11.26	7.78	8.77
F	Allium sp.	9	12	-	-	.03	.02	-	-
F	Androsace septentrionalis (a)	6	-	-	-	.01	-	-	-
F	Antennaria sp.	b39	a20	a17	a21	.83	.78	.27	.19
F	Arabis demissa	7	-	-	9	.18	-	-	.02
F	Aster sp.	-	-	3	-	-	-	.00	-
F	Astragalus sp.	b24	a9	a6	a6	.14	.05	.01	.01
F	Castilleja linariaefolia	-	-	-	4	-	-	-	.04
F	Chaenactis douglasii	-	3	3	3	-	.00	.00	.00
F	Chenopodium sp. (a)	-	8	-	1	-	.05	-	.00
F	Cirsium sp.	5	7	2	2	.18	.09	.00	.00
F	Collinsia parviflora (a)	9	-	-	-	.02	-	-	-
F	Comandra pallida	5	8	3	-	.06	.04	.01	-
F	Erigeron eatonii	-	5	4	4	-	.03	.01	.01
F	Erigeron pumilus	7	9	12	6	.18	.04	.05	.18
F	Eriogonum racemosum	24	32	28	31	.27	.52	.12	.21
F	Eriogonum umbellatum	4	-	3	4	.01	-	.03	.03
F	Gayophytum ramosissimum(a)	-	5	-	-	-	.03	-	-
F	Hymenoxys richardsonii	-	-	-	-	-	.00	-	-
F	Lappula occidentalis (a)	-	4	-	-	-	.01	-	-
F	Lithospermum incisum	-	1	-	-	-	.03	-	-
F	Lupinus argenteus	-	2	1	2	-	.03	.00	.01
F	Machaeranthera canescens	b13	b15	a-	ab7	.05	.17	-	.04
F	Machaeranthera grindelioides	a-	a2	b13	ab4	-	.03	.13	.01
F	Penstemon sp.	11	5	3	1	.05	.01	.01	.00
F	Phlox austromontana	35	25	34	28	.35	.48	.38	.30
F	Phlox longifolia	4	7	2	-	.01	.01	.03	-
F	Polygonum douglasii (a)	a1	b19	a-	a-	.00	.05	-	-
F	Senecio multilobatus	7	-	2	2	.04	-	.00	.00



Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
F	<i>Sphaeralcea coccinea</i>	4	-	-	3	.00	-	-	.00
F	Unknown forb-perennial	-	3	1	-	-	.03	.03	-
Total for Annual Forbs		16	36	0	1	0.03	0.15	0	0.00
Total for Perennial Forbs		198	165	137	137	2.42	2.39	1.11	1.11
Total for Forbs		214	201	137	138	2.46	2.55	1.11	1.11

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

#### BROWSE TRENDS--

Management unit 25A, Study no: 18

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia frigida</i>	-	.06	.15	.15	.11	-	-
B	<i>Artemisia nova</i>	5.33	5.49	3.75	3.94	5.73	3.81	5.38
B	<i>Artemisia tridentata vaseyana</i>	7.46	9.99	10.09	8.35	9.53	12.91	12.93
B	<i>Chrysothamnus parryi</i>	.48	.51	.04	.16	.68	.28	.03
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	3.28	7.94	4.53	6.44	7.61	1.78	7.18
B	<i>Coryphantha vivipara</i>	.00	-	-	-	-	-	-
B	<i>Gutierrezia sarothrae</i>	.70	1.05	1.00	.09	.95	1.68	.10
B	<i>Mahonia repens</i>	.04	.15	.05	.10	.13	-	-
B	<i>Opuntia sp.</i>	-	-	.06	.15	-	.01	.03
B	<i>Pediocactus simpsonii</i>	-	.00	-	-	-	-	-
B	<i>Pinus edulis</i>	2.52	1.69	2.67	1.92	4.30	4.11	8.48
B	<i>Purshia tridentata</i>	6.54	5.57	3.84	2.45	8.36	6.00	6.80
B	<i>Rosa woodsii</i>	1.90	.69	.34	.52	1.26	.33	.26
B	<i>Sarcobatus vermiculatus</i>	-	-	-	.15	-	-	-
B	<i>Symphoricarpos oreophilus</i>	.75	.88	1.55	1.17	2.38	2.23	3.36
B	<i>Tetradymia canescens</i>	.06	.09	.53	.03	.75	.23	.05
Total for Browse		29.08	34.14	28.62	25.66	41.79	33.37	44.6

#### POINT-QUARTER TREE DATA--

Management unit 25A, Study no: 18

Species	Trees per Acre				Average diameter (in)			
	'99	'04	'09	'13	'99	'04	'09	'13
<i>Juniperus scopulorum</i>	10	24	25	25	3.8	3.8	4.7	6
<i>Pinus edulis</i>	10	26	23	32	3.8	6.4	2.1	3

BASIC COVER--

Management unit 25A, Study no: 18

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	42.04	45.71	37.63	37.57
Rock	15.66	16.39	13.93	18.91
Pavement	2.48	3.81	2.59	2.34
Litter	33.96	31.74	37.47	43.28
Cryptogams	.06	.04	.03	.08
Bare Ground	14.08	19.52	24.99	20.88

PELLET GROUP DATA--

Management unit 25A, Study no: 18

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Sheep	-	-	1	-	-	-	-	-
Rabbit	23	27	20	5	-	-	-	-
Elk	18	4	7	7	21 (52)	-	39 (96)	27 (66)
Deer	27	49	21	15	53 (130)	66 (162)	105 (260)	2 (5)
Cattle	4	1	6	2	11 (27)	4 (9)	2 (5)	2 (5)

BROWSE CHARACTERISTICS--

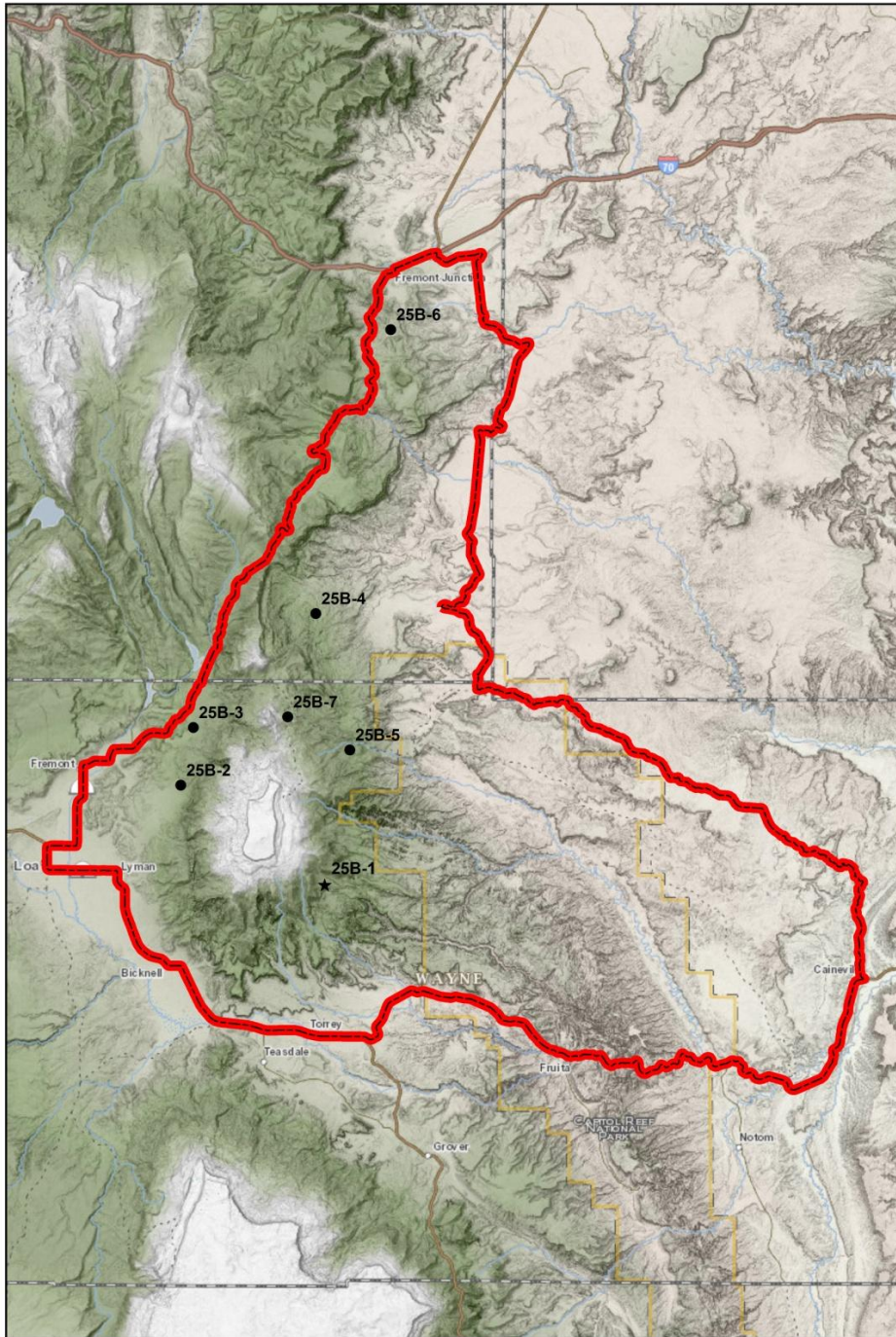
Management unit 25A, Study no: 18

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	16/17
13	0	0	0	-	-	0	0	0	-/-
<b>Artemisia frigida</b>									
99	120	33	67	-	-	33	0	0	3/8
04	240	8	92	-	-	50	8	0	6/7
09	100	0	100	-	-	0	0	0	4/6
13	80	0	100	-	-	25	25	0	2/7
<b>Artemisia nova</b>									
99	3560	10	69	21	60	35	7	2	10/20
04	3200	4	70	26	300	23	13	10	9/19
09	3020	10	81	9	40	0	0	7	10/19
13	3100	23	70	6	260	34	9	25	8/16
<b>Artemisia tridentata vaseyana</b>									
99	2740	23	61	15	180	44	3	7	27/37
04	2600	18	64	18	13140	40	22	9	19/31
09	3540	29	65	6	420	18	2	3	18/30
13	2660	19	68	13	20	41	15	12	20/32

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus parryi</b>									
99	<b>280</b>	7	93	-	-	7	21	0	9/13
04	<b>360</b>	0	100	-	-	39	0	0	12/18
09	<b>80</b>	25	75	-	-	0	0	0	10/7
13	<b>100</b>	0	100	-	-	20	40	0	7/11
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
99	<b>4060</b>	12	85	2	-	5	1	.98	6/12
04	<b>6440</b>	2	97	1	-	0	0	.31	9/15
09	<b>5020</b>	16	84	0	-	0	0	.79	7/13
13	<b>6180</b>	17	81	1	100	34	.64	13	8/18
<b>Coryphantha vivipara</b>									
99	<b>40</b>	0	100	-	-	0	0	0	3/2
04	<b>40</b>	0	100	-	-	0	0	0	2/3
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>60</b>	0	100	-	-	0	0	33	2/6
<b>Gutierrezia sarothrae</b>									
99	<b>580</b>	0	100	0	-	0	0	0	5/7
04	<b>1860</b>	0	100	0	-	0	0	0	9/10
09	<b>1160</b>	3	95	2	-	5	0	2	6/8
13	<b>280</b>	0	100	0	-	0	0	0	5/7
<b>Mahonia repens</b>									
99	<b>780</b>	18	82	-	-	0	0	0	2/2
04	<b>1100</b>	0	100	-	-	0	0	0	3/4
09	<b>520</b>	0	100	-	-	0	0	0	2/3
13	<b>400</b>	80	20	-	-	0	0	0	3/4
<b>Opuntia sp.</b>									
99	<b>0</b>	0	0	-	-	0	0	0	2/5
04	<b>80</b>	50	50	-	-	0	0	0	3/8
09	<b>80</b>	0	100	-	-	0	0	0	3/7
13	<b>100</b>	40	60	-	-	0	0	0	4/11
<b>Pediocactus simpsonii</b>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>120</b>	67	33	-	-	0	0	0	3/5
09	<b>40</b>	0	100	-	-	0	0	0	3/5
13	<b>0</b>	0	0	-	-	0	0	0	2/3
<b>Pinus edulis</b>									
99	<b>60</b>	33	67	-	-	0	0	0	-/-
04	<b>80</b>	50	50	-	-	0	0	0	-/-
09	<b>60</b>	67	33	-	-	0	0	0	-/-
13	<b>80</b>	50	50	-	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Purshia tridentata</b>									
99	<b>2560</b>	14	80	5	20	32	57	3	13/29
04	<b>2060</b>	5	86	9	-	9	90	7	13/31
09	<b>1520</b>	5	91	4	-	32	57	39	10/26
13	<b>1300</b>	8	58	34	20	12	43	54	18/42
<b>Rosa woodsii</b>									
99	<b>1480</b>	42	58	-	60	0	0	0	12/14
04	<b>1320</b>	3	97	-	-	0	0	0	8/8
09	<b>760</b>	32	68	-	-	5	21	0	10/9
13	<b>800</b>	33	68	-	-	0	0	0	11/14
<b>Symphoricarpos oreophilus</b>									
99	<b>560</b>	18	82	0	20	39	18	0	18/30
04	<b>800</b>	13	88	0	20	8	0	0	16/32
09	<b>640</b>	9	91	0	-	3	0	16	15/31
13	<b>860</b>	21	65	14	-	44	7	9	15/28
<b>Tetradymia canescens</b>									
99	<b>260</b>	8	62	31	-	54	0	8	10/10
04	<b>320</b>	19	81	0	-	38	6	0	11/12
09	<b>120</b>	0	100	0	-	0	0	0	9/11
13	<b>140</b>	29	57	14	-	57	14	43	6/12
<b>Yucca sp.</b>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	7/9
09	<b>0</b>	0	0	-	-	0	0	0	7/6
13	<b>0</b>	0	0	-	-	0	0	0	6/12

# WILDLIFE MANAGEMENT UNIT 25B - THOUSAND LAKE

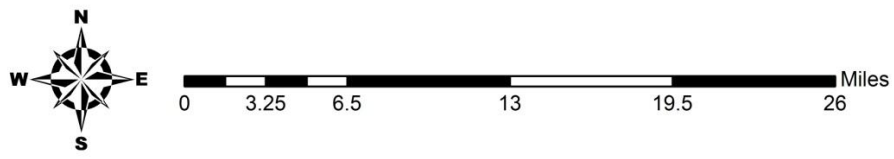
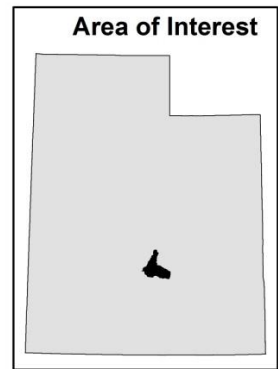


**Unit - 25B**

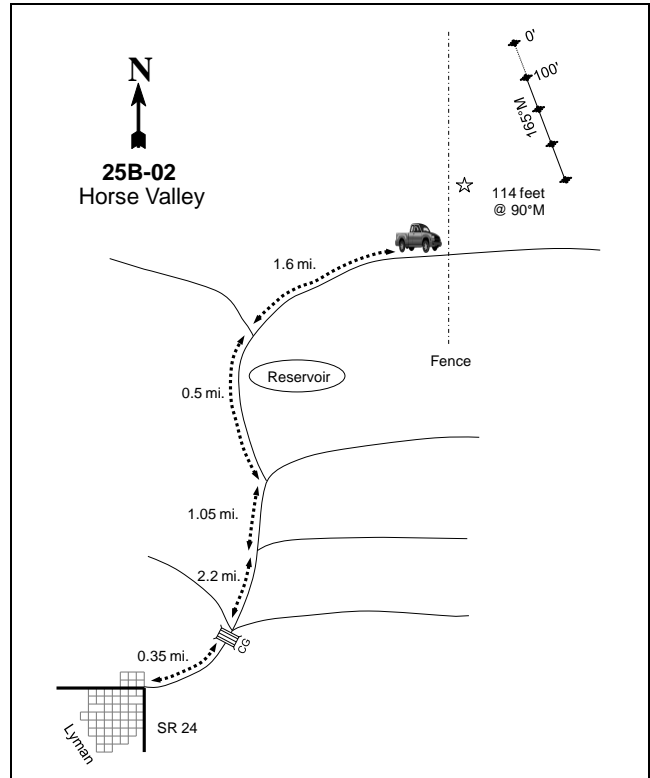
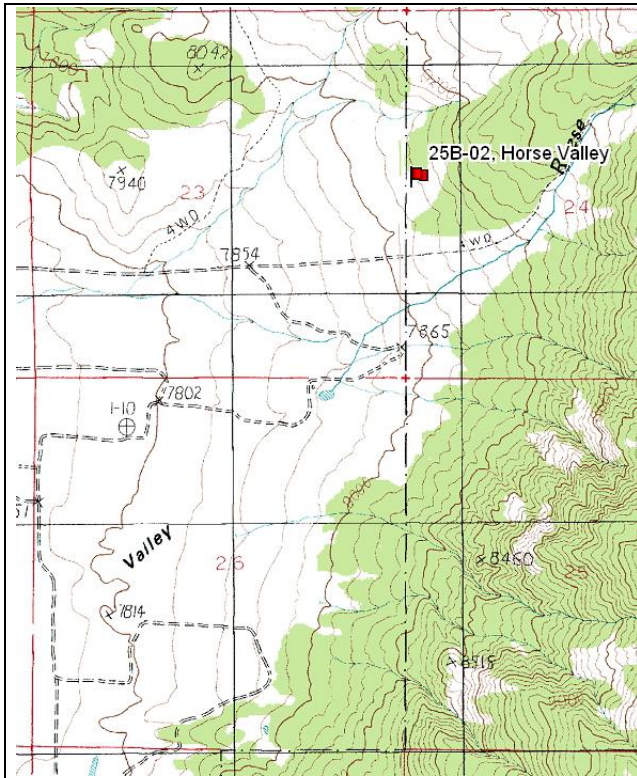
**Study Location**

**Project, Status**

- RT, Active
- ★ RT, Suspended



HORSE VALLEY - TREND STUDY NO. 25B-2



**Location Information**

USGS 7.5 min Map Info Lyman; Township 27S, Range 3E, Section 24  
 GPS (0' Stake) NAD 83, UTM Zone 12, 452723 East 4255665 North

**Transect Information**

Browse Tag # (0' Stake) 7065  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

At the north end of Main Street (SR 24) in Lyman, SR 24 turns west towards Loa. Turn east here and go 0.35 miles to a 3-way split just beyond a cattleguard. Take the middle fork (the main road) and go 2.2 miles to a fork. Stay left and continue 1.05 miles on the main road to another fork. Again stay left and proceed 0.5 miles north just past a small reservoir to an intersection. Take the right fork toward Neffs Reservoir. On the main road, go 1.6 miles up and east across the top of some private land to a cattleguard at the Forest Service boundary. Park here, then walk 532 feet north along the east side of the fence to a witness post (rebar) next to the fence. The 400' stake is 114 feet east of the witness post. The 0-foot baseline stake lies 400 feet north, and has a red browse tag #7065 attached.

**Site Information**

Land Ownership USFS  
 Allotment Thousand Lake  
 Elevation 8,020ft (2,444m)  
 Aspect Southwest  
 Slope 5-10%  
 Sample Dates 09/03/1985, 06/14/1991, 07/20/1994, 08/26/1999, 08/11/2004, 08/19/2009, 08/21/2013

**DISTURBANCE HISTORY--**

Management unit 25B, Study no: 2

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Bullhog	Cedar Creek Winter Range Enhancement	<a href="#">818</a>	Fall 2012	3,569

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 25B, Study no: 2

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1985-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This site is thought to be a winter deer concentration area, with many moving into the lower fields in late winter or early spring.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

**SOIL ANALYSIS DATA--**

Management unit 25B, Study no: 2

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Clay Loam	50.9	27.8	21.3	7.6	0.5	2.2	7.7	112.0	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Since established in 1985, the site has remained in a stable state with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) being the dominant shrub component on the site (Table - Browse Trends). The herbaceous understory has been limited over the sample years and has consisted of native species (Appendix B -Pre-1992 Data) (Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) increased on the site in cover and density over the sample years until the bullhog treatment in 2012 which removed most of the trees on the study site (Table - Point-Quarter Tree Data). The areas surrounding the site are mostly pinyon and Utah juniper

(*Juniperus osteosperma*) dominated. Moreover, the site has the potential to transition to a pinyon and juniper dominated site without treatment of these surrounding areas.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 25B, study no: 2

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	18.9	2.4	1.5	3.0	0.0	2.5	0.0	<b>28.3</b>	Fair
1999	23.7	2.7	5.0	4.4	0.0	4.4	0.0	<b>40.2</b>	Fair
2004	22.2	3.9	2.0	3.1	0.0	0.4	0.0	<b>31.6</b>	Fair
2009	20.7	-3.0	1.0	3.1	0.0	0.3	0.0	<b>22.1</b>	Poor
2013	21.0	3.6	2.5	3.8	0.0	2.8	0.0	<b>33.7</b>	Fair

#### HERBACEOUS TRENDS--

Management unit 25B, Study no: 2

Type	Species	Nested Frequency					Average Cover %				
		'94	'99	'04	'09	'13	'94	'99	'04	'09	'13
G	Agropyron cristatum	-	-	-	-	6	-	-	-	-	.07
G	Bouteloua gracilis	69	69	61	51	57	1.16	1.66	1.24	1.10	1.09
G	Carex sp.	-	-	-	-	2	-	-	-	-	.00
G	Oryzopsis hymenoides	a-	a1	b14	ab3	b14	-	.00	.12	.04	.28
G	Sitanion hystrix	b59	ab55	a30	ab43	ab29	.34	.55	.18	.41	.45
G	Stipa comata	-	1	-	-	-	.00	.00	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		128	126	105	97	108	1.50	2.22	1.54	1.55	1.91
Total for Grasses		128	126	105	97	108	1.50	2.22	1.54	1.55	1.91
F	Androsace septentrionalis (a)	-	7	-	-	-	-	.02	-	-	-
F	Arabis demissa	a-	a-	a-	a-	b13	-	-	-	-	.02
F	Astragalus convallarius	3	3	-	1	-	.00	.01	-	.00	-
F	Cryptantha jamesii	a6	a-	b11	ab10	c25	.04	-	.06	.07	.20
F	Cryptantha sp.	3	-	-	-	-	.03	-	-	-	-
F	Erigeron pumilus	3	3	-	-	1	.01	.01	-	-	.00
F	Hymenoxys richardsonii	b44	b54	a7	a8	a19	1.16	2.17	.15	.06	1.17
F	Phlox longifolia	-	3	-	-	-	-	.00	-	-	-
Total for Annual Forbs		0	7	0	0	0	0	0.01	0	0	0
Total for Perennial Forbs		59	63	18	19	58	1.25	2.19	0.21	0.13	1.40
Total for Forbs		59	70	18	19	58	1.25	2.21	0.21	0.13	1.40

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



BROWSE TRENDS--

Management unit 25B, Study no: 2

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'99	'04	'09	'13	'04	'09	'13
B	Artemisia nova	-	-	-	.03	.00	-	.16	.25
B	Artemisia tridentata wyomingensis	15.11	18.95	17.78	16.52	16.78	18.28	20.23	21.29
B	Chrysothamnus viscidiflorus stenophyllus	1.06	.46	1.72	.28	.95	.75	.20	.38
B	Gutierrezia sarothrae	.18	1.15	3.43	.14	.32	4.80	.25	.56
B	Leptodactylon pungens	-	-	-	-	.15	-	-	.20
B	Opuntia sp.	.04	.13	.21	.04	.19	-	-	.21
B	Pinus edulis	-	.15	.21	.16	.18	.65	.96	.41
Total for Browse		16.39	20.85	23.37	17.17	18.58	24.48	21.8	23.3

POINT-QUARTER TREE DATA--

Management unit 25B, Study no: 2

Species	Trees per Acre				Average diameter (in)			
	'99	'04	'09	'13	'99	'04	'09	'13
Pinus edulis	53	118	114	67	2.3	1.0	1.6	1.8

BASIC COVER--

Management unit 25B, Study no: 2

Cover Type	Average Cover %				
	'94	'99	'04	'09	'13
Vegetation	18.79	24.79	24.46	19.28	20.64
Rock	18.92	12.81	16.38	12.79	10.30
Pavement	8.72	22.56	27.48	23.88	22.11
Litter	16.85	21.91	23.25	20.76	21.34
Cryptogams	1.15	2.45	1.54	.39	1.02
Bare Ground	34.85	24.42	25.75	31.72	28.26

PELLET GROUP DATA--

Management unit 25B, Study no: 2

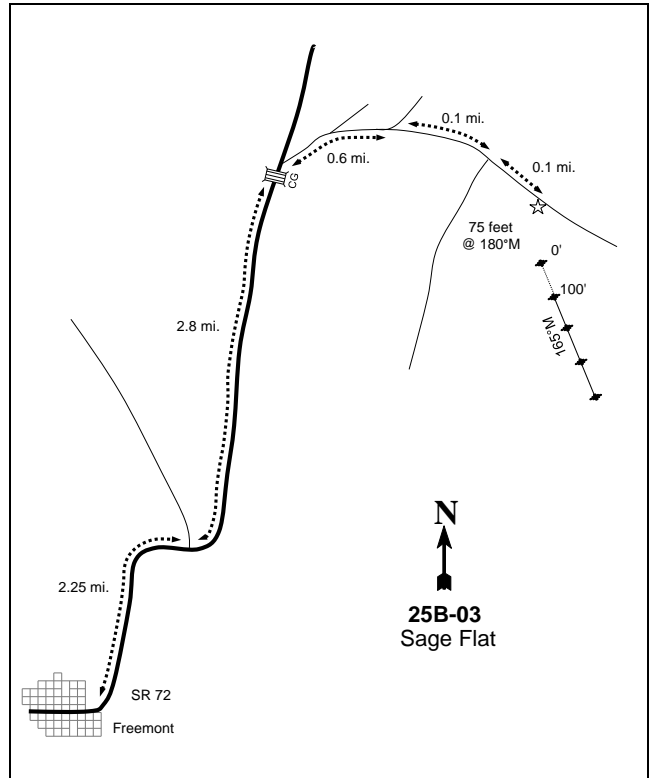
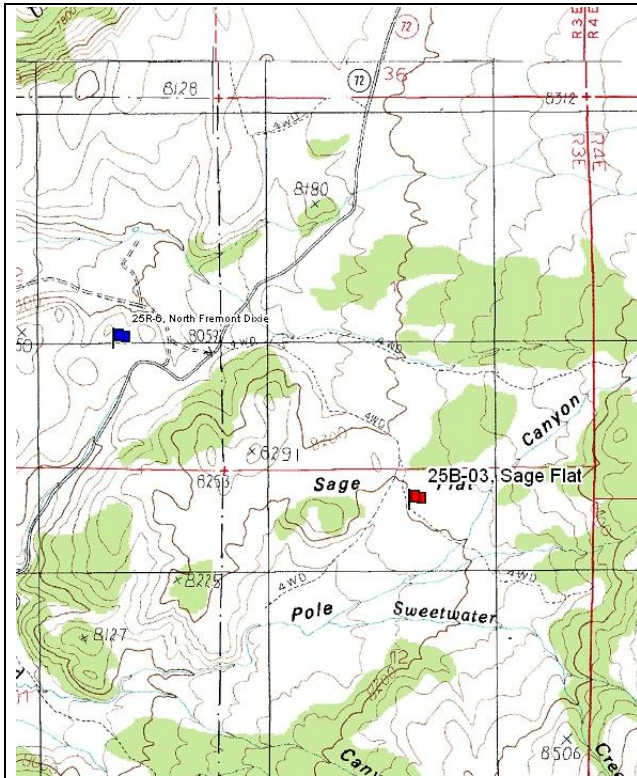
Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	14	9	3	37	1	-	-	-	-
Elk	-	-	-	1	-	-	1 (3)	1 (2)	-
Deer	8	3	-	2	-	1 (2)	1 (3)	17 (41)	1 (3)
Cattle	-	-	-	-	-	1 (2)	-	-	-

BROWSE CHARACTERISTICS--  
Management unit 25B, Study no: 2

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 nova</i>									
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	20	0	100	-	-	0	0	0	8/14
13	20	0	100	-	-	0	0	0	7/18
<i>Artemisia tridentata wyomingensis</i>									
94	3820	3	55	42	200	24	3	26	19/35
99	4520	10	50	41	60	28	3	14	18/28
04	4400	4	59	37	100	7	0	23	17/27
09	4760	2	38	60	-	28	13	33	16/26
13	3960	5	57	38	-	67	19	31	19/33
<i>Atriplex canescens</i>									
94	0	0	0	0	-	0	0	0	-/-
99	80	0	75	25	-	25	0	25	-/-
04	0	0	0	0	-	0	0	0	-/-
09	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
94	2940	0	69	31	-	30	7	12	4/6
99	1180	15	63	22	20	0	0	12	6/10
04	1480	5	64	31	-	8	7	12	7/11
09	1300	5	77	18	40	0	0	17	12/6
13	1040	6	90	4	20	15	10	12	6/10
<i>Echinocereus triglochidatus</i>									
94	0	0	0	-	-	0	0	0	-/-
99	20	0	100	-	-	0	0	0	4/6
04	20	0	100	-	-	0	0	0	3/6
09	20	100	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	5/9
<i>Gutierrezia sarothrae</i>									
94	1420	14	79	7	-	0	0	1	7/6
99	4980	64	26	10	2340	0	0	.40	7/8
04	5920	2	98	0	-	0	0	0	7/9
09	940	17	70	13	-	0	2	9	6/5
13	1160	38	60	2	440	0	0	2	7/8

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Juniperus osteosperma</b>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>60</b>	100	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Leptodactylon pungens</b>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>40</b>	100	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>40</b>	0	100	-	-	0	0	0	5/7
<b>Opuntia sp.</b>									
94	<b>160</b>	0	88	13	-	0	0	0	3/7
99	<b>600</b>	27	53	20	20	0	0	20	3/11
04	<b>400</b>	0	100	0	-	0	0	0	3/12
09	<b>240</b>	0	100	0	-	0	0	0	3/10
13	<b>440</b>	14	86	0	40	0	0	5	3/9
<b>Pinus edulis</b>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>80</b>	100	0	-	40	0	0	0	-/-
04	<b>120</b>	83	17	-	20	0	0	0	-/-
09	<b>120</b>	50	50	-	20	0	17	0	-/-
13	<b>120</b>	100	0	-	20	0	17	0	-/-

SAGE FLAT - TREND STUDY NO. 25B-3



**Location Information**

USGS 7.5 min Map Info Lyman; Township 27S, Range 3E, Section 12  
 GPS (0' Stake) NAD 83, UTM Zone 12, 453556 East 4259466 North

**Transect Information**

Browse Tag # (0' Stake) 149  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Travel north on SR 72 for 2.25 miles from Fremont to a major fork, bear right and continue 2.8 miles to a cattleguard at the Forest Service boundary. One hundred yards beyond the cattleguard turn right. At 0.15 miles, a road forks off to the right. Go up this rough road 0.45 miles to a fork. Turn right and go 0.1 miles to another fork. Turn left at the fork and go 0.1 miles into the flat to a witness post on the right side of the road. The witness post and transect stakes are green steel fence posts with a white top. The 0-foot stake is marked by browse tag #149 and marks the beginning of the frequency baseline, which starts 75' due south of the witness post.

**Site Information**

Land Ownership USFS  
 Allotment Thousand Lake  
 Elevation 8,200ft (2,499m)  
 Aspect Southwest  
 Slope 2-5%  
 Sample Dates 06/05/1991, 07/19/1994, 08/17/1999, 08/25/2004, 08/13/2009, 08/22/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse Opportunity Not Winter

## VEGETATION HISTORY--

Management unit 25B, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The flat is thought to be an important deer concentration area in winter and spring and would be enhanced by early season herbaceous species.

**Site Potential**

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

## SOIL ANALYSIS DATA--

Management unit 25B, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	42.6	31.8	25.6	7.7	0.7	1.9	4.7	67.2	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1985, the site has remained in a stable state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) being the dominant shrub species on the site (Table - Browse Trends). The herbaceous understory has been limited over the sample years and has consisted of perennial native species (Table - Herbaceous Trends). The areas surrounding the site are mostly pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) dominated. The site has the potential to transition to a pinyon and juniper dominated community without treatment or fire in the surrounding areas.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25B, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	27.0	10.2	15.0	8.1	0.0	0.5	0.0	<b>60.7</b>	Good
1999	26.2	8.0	15.0	6.0	0.0	0.7	0.0	<b>55.9</b>	Good
2004	28.7	9.0	13.0	5.5	0.0	0.4	0.0	<b>56.5</b>	Good
2009	22.3	6.9	3.5	4.8	0.0	0.3	0.0	<b>37.8</b>	Fair
2013	24.3	9.1	5.0	13.1	0.0	0.8	0.0	<b>52.3</b>	Good

## HERBACEOUS TRENDS--

Management unit 25B, Study no: 3

Type	Species	Nested Frequency					Average Cover %				
		'94	'99	'04	'09	'13	'94	'99	'04	'09	'13
G	Agropyron smithii	c222	ab153	ab142	a119	bc187	2.41	1.15	.72	.84	2.95
G	Agropyron spicatum	a-	b71	a3	a2	a-	-	.50	.06	.00	-
G	Bouteloua gracilis	19	19	17	12	25	.25	.36	.74	.68	1.12
G	Oryzopsis hymenoides	a6	ab24	b29	ab23	ab24	.21	.29	.51	.56	.94
G	Poa secunda	-	-	-	5	-	-	-	-	.00	-
G	Sitanion hystrix	b60	ab46	ab46	a23	ab45	1.14	.66	.69	.30	1.54
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		307	313	237	184	281	4.03	2.98	2.73	2.41	6.57
Total for Grasses		307	313	237	184	281	4.03	2.98	2.73	2.41	6.57
F	Arabis sp.	a-	a2	a3	a-	b18	-	.01	.03	-	.11
F	Cryptantha sp.	b13	a-	ab5	b12	b11	.09	-	.02	.13	.02
F	Descurainia pinnata (a)	-	-	-	2	1	-	-	-	.03	.00
F	Erigeron pumilus	b23	c42	ab20	a3	bc37	.12	.15	.13	.01	.25
F	Hymenoxys richardsonii	-	2	-	-	6	.00	.15	-	-	.01
F	Penstemon pachyphyllus	-	1	-	-	3	.00	.00	-	-	.00
F	Phlox longifolia	ab7	b13	ab5	a4	ab5	.01	.04	.01	.03	.01
Total for Annual Forbs		0	0	0	2	1	0	0	0	0.03	0.00
Total for Perennial Forbs		43	60	33	19	80	0.23	0.35	0.18	0.17	0.41
Total for Forbs		43	60	33	21	81	0.23	0.35	0.18	0.20	0.41

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

BROWSE TRENDS--

Management unit 25B, Study no: 3

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'99	'04	'09	'13	'04	'09	'13
B	Artemisia frigida	.15	.30	.15	.03	.03	-	.05	.13
B	Artemisia nova	-	.63	.63	.15	.15	.08	.31	.36
B	Artemisia tridentata wyomingensis	21.47	20.11	22.17	17.67	19.29	23.20	21.04	21.76
B	Chrysothamnus viscidiflorus stenophyllus	.01	.00	.03	.01	.18	-	-	-
B	Gutierrezia sarothrae	.69	.33	2.59	.16	.36	1.79	.10	.31
B	Tetradymia canescens	-	-	-	-	-	-	-	-
Total for Browse		22.33	21.37	25.57	18.03	20.03	25.07	21.5	22.56

BASIC COVER--

Management unit 25B, Study no: 3

Cover Type	Average Cover %				
	'94	'99	'04	'09	'13
Vegetation	24.93	24.49	26.55	20.60	26.73
Rock	1.67	.54	2.04	.01	.22
Pavement	.98	4.90	4.84	6.38	6.71
Litter	18.25	19.50	19.04	19.51	20.85
Cryptogams	7.34	7.58	10.43	3.29	4.48
Bare Ground	50.48	46.57	46.81	59.15	46.79

PELLET GROUP DATA--

Management unit 25B, Study no: 3

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	25	53	11	54	7	-	-	-	-
Elk	4	3	3	-	1	6 (15)	3 (7)	-	1 (3)
Deer	1	2	2	12	1	21 (52)	9 (23)	9 (22)	1 (2)
Cattle	4	2	1	-	1	15 (37)	-	1 (2)	2 (4)

BROWSE CHARACTERISTICS--

Management unit 25B, Study no: 3

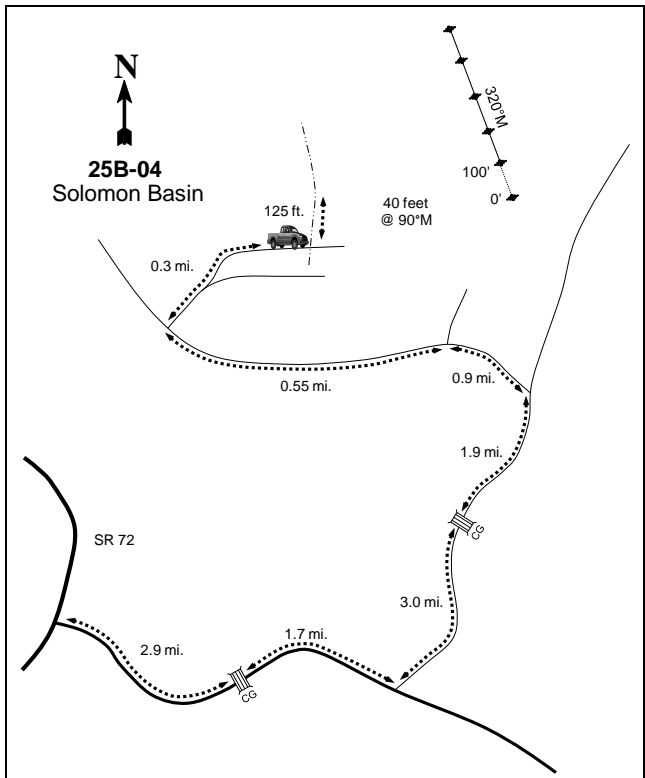
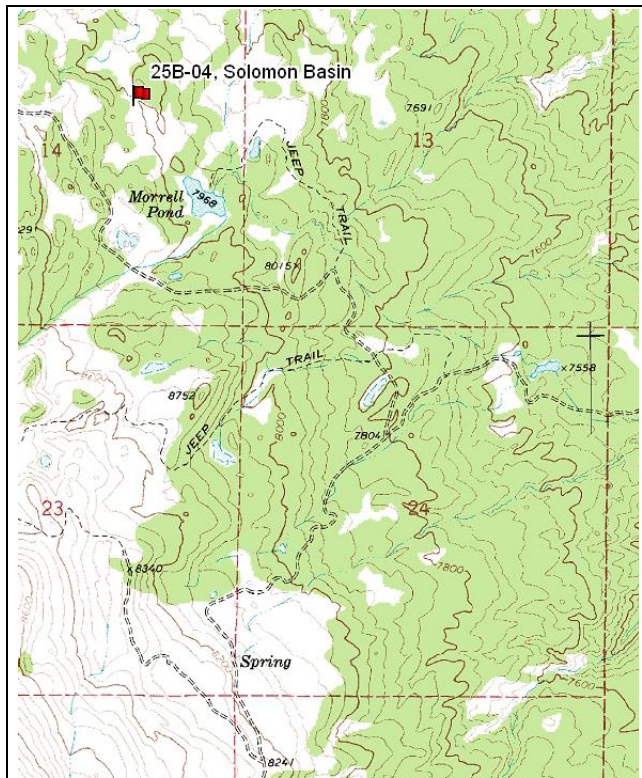
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Artemisia frigida									
94	<b>320</b>	0	100	0	-	0	0	0	3/5
99	<b>500</b>	24	68	8	20	44	32	0	3/5
04	<b>220</b>	0	100	0	-	27	0	0	3/4
09	<b>100</b>	0	100	0	-	0	20	0	6/8
13	<b>140</b>	14	86	0	-	0	0	0	6/12

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 nova</i>									
94	0	0	0	0	-	0	0	0	-/-
99	140	57	29	14	-	57	0	0	6/10
04	140	0	71	29	-	0	0	14	9/16
09	120	0	67	33	-	0	0	33	7/13
13	100	0	100	0	-	100	0	60	5/13
<i>Artemisia tridentata wyomingensis</i>									
94	12960	39	45	16	40	.46	0	8	19/29
99	11920	43	33	24	280	54	10	8	18/27
04	11360	27	54	20	20	26	8	11	15/23
09	11480	7	67	27	-	28	2	21	14/20
13	8420	10	70	20	540	46	44	33	14/23
<i>Ceratoides lanata</i>									
94	20	100	0	-	-	0	0	0	2/2
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
94	240	8	58	33	-	0	0	0	4/6
99	280	21	14	64	-	0	29	43	4/6
04	360	33	61	6	-	17	0	6	4/5
09	300	7	80	13	-	0	0	13	2/4
13	520	15	81	4	-	35	12	12	4/7
<i>Coryphantha vivipara arizonica</i>									
94	0	0	0	-	-	0	0	0	-/-
99	60	100	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Eriogonum microthecum</i>									
94	0	0	0	0	-	0	0	0	-/-
99	0	0	0	0	-	0	0	0	-/-
04	40	0	50	50	-	0	100	50	7/2
09	20	0	100	0	-	0	0	0	2/4
13	0	0	0	0	-	0	0	0	5/9
<i>Gutierrezia sarothrae</i>									
94	3760	7	85	9	60	0	0	.53	5/5
99	1200	47	50	3	840	0	0	2	6/6
04	4500	0	100	0	-	0	0	0	6/8
09	820	2	95	2	-	0	0	2	5/6
13	2860	39	61	0	940	0	6	.69	4/5



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Leptodactylon pungens</b>										
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	60	0	100	-	-	67	0	0	8/12	
<b>Mahonia repens</b>										
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	100	0	0	-/-	
<b>Opuntia sp.</b>										
94	0	0	0	-	-	0	0	0	3/9	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Pediocactus simpsonii</b>										
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	0/2	

SOLOMON BASIN - TREND STUDY NO. 25B-4



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Geyser Peak; Township 26S, Range 4E, Section 14  
NAD 83, UTM Zone 12, 461652 East 4266999 North

**Transect Information**

Browse Tag # (0' Stake)	26
Transect Bearing	320° magnetic
Length	500ft
Belt Placement	Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) Line 5 (95ft)
Belt Marker Placement	Standard

**Directions to Site**

Travel north from Fremont on SR 72 for 7.3 miles to the Elkhorn-Torrey Road. Turn right and go 2.9 miles to a cattleguard. From the cattleguard go 1.7 miles to an intersection by Heart Lake. Turn left toward Meeks Lake and go 3.0 miles to a cattleguard. Go another 1.9 miles on the main road to an intersection. Stay left and go 0.9 miles toward Solomon Basin. Stay left again, bypassing the Morrell Pond Road and continue 0.55 miles, passing a doughnut-shaped pond. Take a sharp right turn here and go 0.2 miles to another fork. Bear left (the right fork takes you to Morrells Pond) and drive less than 0.1 miles to a ditch. Park here (very faint) and walk down the ditch for approximately 125 feet. The 0-foot stake is approximately 40 feet east of the ditch and marked with browse tag #26.

**Site Information**

Land Ownership USFS  
 Allotment Solomon  
 Elevation 8,000ft (2,438m)  
 Aspect East  
 Slope 0-20%  
 Sample Dates 07/20/1994, 08/25/1999, 08/25/2004, 08/17/2009, 08/20/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter; Sage-Grouse Opportunity Not Winter

VEGETATION HISTORY--

Management unit 25B, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1994-2013	Mountain Big Sagebrush/Black Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This study was reestablished in 1994 after a new road was run through the original transect. The new site is located between two low parallel ridges in a narrow, shallow ravine. The site is part of a pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodland with nearby quaking aspen (*Populus tremuloides*) stands and sagebrush flats. A pond is also nearby, which may concentrate grazing in the area.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Black Sagebrush\)](#)  
 NRCS Ecological Site # R047XB309UT

SOIL ANALYSIS DATA--

Management unit 25B, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	44.2	20.2	35.6	7.3	0.5	2.0	4.6	208.0	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1994, the study site has remained in a stable state with a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), black sagebrush (*A. nova*), pinyon pine, Utah juniper, and a diverse number of other shrubs that offer limited cover (Table - Browse Trends; Table - Browse Characteristics). The herbaceous understory has been diverse and consisted mostly of native perennial species over the sample years (Table - Herbaceous Trends). The site has the potential to transition to a pinyon and juniper dominated site without disturbance.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25B, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	11.5	11.0	8.8	18.3	0.0	4.0	0.0	<b>53.6</b>	Fair
1999	17.4	10.8	6.5	23.5	0.0	8.8	0.0	<b>67.0</b>	Good
2004	17.0	11.8	7.2	11.5	0.0	3.8	0.0	<b>51.3</b>	Poor-Fair
2009	12.8	9.5	9.7	9.9	0.0	1.5	0.0	<b>43.5</b>	Poor
2013	20.8	13.9	9.8	8.6	0.0	3.3	0.0	<b>56.2</b>	Fair

## HERBACEOUS TRENDS--

Management unit 25B, Study no: 4

Type	Species	Nested Frequency					Average Cover %				
		'94	'99	'04	'09	'13	'94	'99	'04	'09	'13
G	Agropyron smithii	a-	a1	ab11	a4	b26	-	.00	.36	.03	.17
G	Agropyron spicatum	-	4	-	-	11	-	.03	-	-	.56
G	Bouteloua gracilis	56	35	23	41	33	.78	1.45	.53	.89	.50
G	Carex sp.	23	16	18	18	13	.16	.12	.31	.36	.09
G	Elymus salina	c201	bc168	b135	a74	a71	5.25	4.33	3.33	.66	1.17
G	Festuca ovina	10	3	-	-	-	.18	.03	-	-	-
G	Oryzopsis hymenoides	b16	a3	b21	ab3	ab2	.09	.15	.07	.07	.21
G	Poa fendleriana	a-	a6	a4	c34	b25	-	.06	.18	1.40	.40
G	Poa pratensis	b65	b76	a25	a14	a30	2.55	5.40	.60	.42	.96
G	Poa secunda	7	-	3	8	4	.01	-	.03	.39	.01
G	Sitanion hystrix	11	12	18	2	9	.05	.12	.11	.00	.09
G	Stipa comata	a10	a-	a2	b39	a6	.07	-	.18	.71	.09
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		399	324	260	237	230	9.16	11.73	5.73	4.97	4.28
Total for Grasses		399	324	260	237	230	9.16	11.73	5.73	4.97	4.28
F	Achillea millefolium	-	-	4	-	5	-	-	.09	-	.15
F	Androsace septentrionalis (a)	-	2	-	-	2	-	.00	-	-	.00
F	Antennaria sp.	5	5	5	5	5	.15	.38	.15	.03	.06
F	Arabis demissa	-	5	-	3	-	-	.01	-	.00	-
F	Artemisia ludoviciana	3	4	3	-	5	.03	.15	.00	-	.18
F	Aster sp.	a5	ab18	b39	ab27	a9	.01	.36	.76	.25	.04
F	Astragalus convallarius	6	6	1	1	1	.01	.04	.03	.00	.00
F	Astragalus miser	-	1	2	3	-	-	.00	.00	.00	-
F	Astragalus sp.	b11	ab1	ab3	a-	a-	.02	.00	.01	-	-
F	Calochortus nuttallii	-	-	-	-	2	-	-	-	-	.00
F	Castilleja linariaefolia	ab7	a3	ab8	b33	bc22	.02	.03	.10	.26	.28
F	Cirsium sp.	9	9	9	8	5	.07	.22	.18	.02	.06
F	Cryptantha sp.	11	3	3	3	3	.05	.04	.03	.02	.00
F	Cymopterus sp.	-	-	4	-	-	-	-	.03	-	-
F	Erigeron pumilus	b18	ab4	a-	a-	ab6	.03	.01	-	-	.03

Type	Species	Nested Frequency					Average Cover %				
		'94	'99	'04	'09	'13	'94	'99	'04	'09	'13
F	Eriogonum racemosum	-	-	-	1	4	-	.00	-	.00	.00
F	Hymenoxys richardsonii	<sub>b</sub> 57	<sub>b</sub> 38	<sub>a</sub> 8	<sub>a</sub> 5	<sub>a</sub> 4	.62	.69	.05	.05	.03
F	Lesquerella sp.	3	-	-	-	-	.00	-	-	-	-
F	Machaeranthera canescens	<sub>bc</sub> 36	<sub>a</sub> 11	<sub>ab</sub> 10	<sub>ab</sub> 12	<sub>c</sub> 40	.38	.49	.26	.05	.62
F	Microsteris gracilis (a)	3	-	-	-	-	.00	-	.00	-	-
F	Penstemon comarrhenus	-	-	1	-	10	-	-	.00	-	.04
F	Penstemon sp.	<sub>a</sub> 2	<sub>ab</sub> 4	<sub>ab</sub> 8	<sub>b</sub> 19	<sub>a</sub> -	.00	.04	.03	.04	-
F	Phlox longifolia	11	9	9	5	2	.02	.01	.05	.01	.03
F	Schoenocrambe linifolia	7	-	-	-	4	.04	-	-	-	.00
F	Senecio multilobatus	-	3	2	-	-	-	.00	.00	-	-
F	Sphaeralcea coccinea	4	2	9	-	3	.01	.03	.06	-	.00
F	Taraxacum officinale	<sub>b</sub> 18	<sub>c</sub> 52	<sub>ab</sub> 3	<sub>a</sub> -	<sub>ab</sub> 7	.49	1.85	.03	-	.06
F	Tragopogon dubius (a)	-	-	4	-	3	-	-	.00	-	.03
F	Unknown forb-perennial	-	1	-	-	-	-	.00	-	-	-
Total for Annual Forbs		3	2	4	0	5	0.00	0.00	0.00	0	0.03
Total for Perennial Forbs		213	179	131	125	137	2.00	4.40	1.91	0.76	1.63
Total for Forbs		216	181	135	125	142	2.00	4.41	1.92	0.76	1.67

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

#### BROWSE TRENDS--

Management unit 25B, Study no: 4

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'99	'04	'09	'13	'04	'09	'13
B	Amelanchier utahensis	.63	.03	-	.03	1.03	.93	-	2.70
B	Artemisia nova	4.28	6.84	7.03	7.18	9.10	9.69	8.96	9.96
B	Artemisia tridentata vaseyana	3.94	6.73	6.41	3.04	6.07	8.16	4.81	8.64
B	Ceratoides lanata	.21	.33	.19	.02	.21	.50	.20	.05
B	Chrysothamnus depressus	-	-	-	-	.19	-	-	.11
B	Chrysothamnus nauseosus	2.23	3.11	2.32	.87	3.65	4.66	2.46	6.84
B	Chrysothamnus viscidiflorus viscidiflorus	2.21	1.47	4.39	.67	.63	5.30	.55	.83
B	Coryphantha vivipara arizonica	-	.00	-	-	-	-	-	-
B	Eriogonum corymbosum	.88	1.17	1.48	1.85	1.85	1.98	.91	1.61
B	Gutierrezia sarothrae	1.27	1.00	1.52	.21	.15	.58	.11	.11
B	Juniperus osteosperma	.15	.15	.03	.38	.91	0	0	1.03
B	Opuntia sp.	.01	-	-	-	-	0	.01	0
B	Pediocactus simpsonii	-	.03	.00	.01	-	-	-	-
B	Pinus edulis	3.49	4.09	6.13	7.96	10.19	9.25	11.66	11.46
B	Symphoricarpos oreophilus	.16	.48	.74	.15	.96	1.76	.05	1.85
B	Tetradymia canescens	.10	.24	.93	.09	.67	1.06	.05	.11
B	Yucca harrimaniae	-	.18	-	-	.03	.50	-	-
Total for Browse		19.60	25.92	31.19	22.50	35.68	44.37	29.77	45.3

POINT-QUARTER TREE DATA--  
Management unit 25B, Study no: 4

Species	Trees per Acre				Average diameter (in)			
	'99	'04	'09	'13	'99	'04	'09	'13
Juniperus osteosperma	27	24	26	23	2.9	3.2	2.8	3.7
Pinus edulis	82	97	90	120	2.1	1.9	2.0	2.8
Juniperus scopulorum	-	-	-	19	-	-	-	0.4

BASIC COVER--  
Management unit 25B, Study no: 4

Cover Type	Average Cover %				
	'94	'99	'04	'09	'13
Vegetation	27.32	38.12	37.22	28.33	41.99
Rock	5.05	2.79	4.19	2.97	2.28
Pavement	4.77	10.95	16.01	13.52	8.05
Litter	29.63	31.77	30.99	30.96	30.13
Cryptogams	.30	.43	.68	.68	.21
Bare Ground	31.40	29.84	28.35	33.97	31.39

PELLET GROUP DATA--  
Management unit 25B, Study no: 4

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	5	12	6	19	-	-	-	-	-
Elk	-	1	-	6	3	1 (2)	9 (23)	8 (20)	3 (7)
Deer	11	6	11	8	2	19 (47)	28 (69)	45 (111)	5 (13)
Cattle	1	9	3	6	-	42 (104)	11 (27)	14 (34)	11 (27)
Moose	-	-	-	-	-	-	1 (2)	-	-

BROWSE CHARACTERISTICS--  
Management unit 25B, Study no: 4

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
94	<b>280</b>	7	93	0	-	7	7	0	33/42
99	<b>120</b>	17	33	50	40	33	0	33	50/57
04	<b>200</b>	30	60	10	-	20	60	10	57/55
09	<b>100</b>	40	20	40	-	0	60	40	59/64
13	<b>120</b>	33	67	0	-	33	33	17	77/98
<b>Artemisia frigida</b>									
94	<b>40</b>	0	100	-	-	0	0	0	1/2
99	<b>20</b>	0	100	-	-	0	0	0	2/6
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-

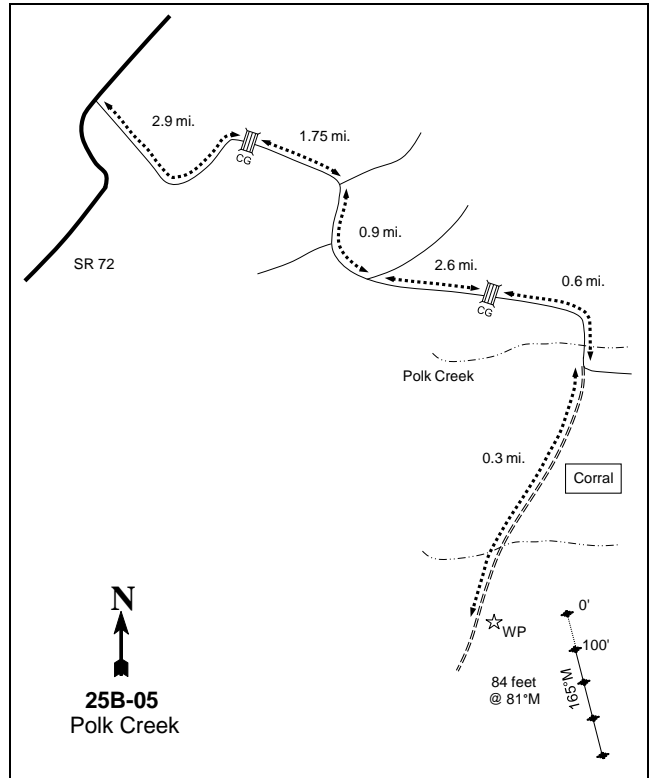
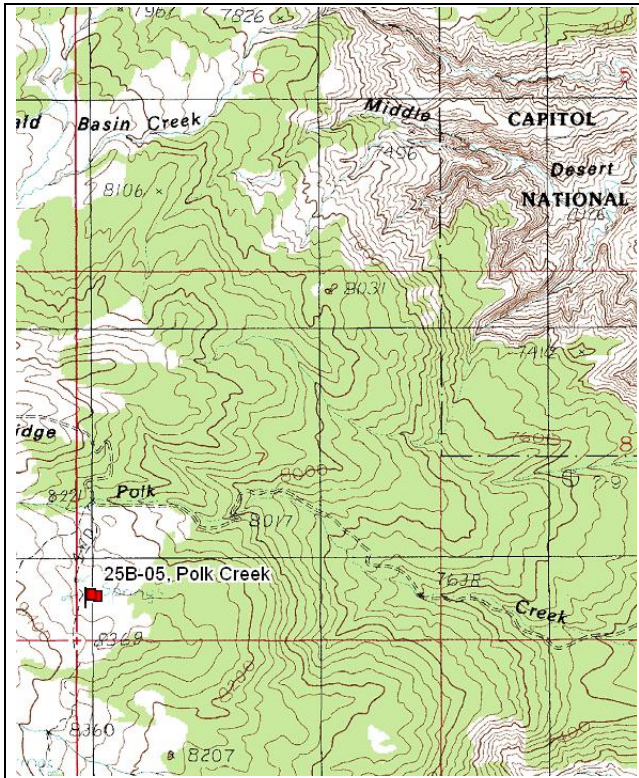
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Artemisia nova</b>									
94	<b>4140</b>	3	75	22	40	5	.48	6	10/16
99	<b>4680</b>	19	66	15	180	22	3	.42	8/17
04	<b>4880</b>	15	74	11	440	0	0	8	9/19
09	<b>6920</b>	20	65	14	300	17	.86	4	8/18
13	<b>3620</b>	9	86	4	640	50	12	6	7/21
<b>Artemisia tridentata vaseyana</b>									
94	<b>1500</b>	36	57	7	-	1	0	4	19/28
99	<b>1360</b>	7	79	13	-	18	3	3	23/36
04	<b>1000</b>	14	76	10	4580	18	2	4	24/40
09	<b>560</b>	18	54	29	120	36	18	21	16/27
13	<b>1700</b>	33	64	4	20	7	0	12	16/30
<b>Atriplex canescens</b>									
94	<b>0</b>	0	0	-	-	0	0	0	28/23
99	<b>0</b>	0	0	-	-	0	0	0	37/32
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>20</b>	0	100	-	-	0	0	0	6/11
13	<b>0</b>	0	0	-	-	0	0	0	6/15
<b>Ceratoides lanata</b>									
94	<b>380</b>	0	100	0	-	58	26	0	6/6
99	<b>460</b>	13	78	9	40	22	74	0	4/7
04	<b>380</b>	0	89	11	-	5	89	5	7/8
09	<b>960</b>	13	88	0	-	50	13	0	4/4
13	<b>200</b>	20	80	0	-	60	0	0	7/8
<b>Cercocarpus montanus</b>									
94	<b>0</b>	0	0	-	-	0	0	0	15/24
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>20</b>	0	100	-	-	0	100	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	30/35
<b>Chrysothamnus depressus</b>									
94	<b>0</b>	0	0	-	-	0	0	0	6/12
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>260</b>	23	77	-	-	77	0	92	7/10
<b>Chrysothamnus nauseosus</b>									
94	<b>640</b>	6	91	3	20	0	3	0	27/29
99	<b>820</b>	15	71	15	-	0	0	7	34/39
04	<b>460</b>	4	78	17	-	0	0	13	32/34
09	<b>640</b>	13	84	3	-	19	9	0	33/35
13	<b>500</b>	4	84	12	-	4	0	24	39/50

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
94	2720	7	81	12	-	3	2	5	9/16	
99	2020	16	66	18	20	0	0	6	12/16	
04	3940	9	86	5	40	3	0	6	12/16	
09	1360	10	60	29	-	4	0	26	5/9	
13	520	0	100	0	-	31	0	8	10/16	
<i>Coryphantha vivipara arizonica</i>										
94	0	0	0	-	-	0	0	0	-/-	
99	20	0	100	-	-	0	100	0	1/4	
04	0	0	0	-	-	0	0	0	2/3	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	2/2	
<i>Eriogonum corymbosum</i>										
94	2660	13	87	0	40	40	24	0	4/8	
99	2100	22	66	12	-	20	11	2	9/16	
04	2120	15	84	1	-	14	37	0	9/16	
09	3960	8	91	1	-	40	8	0	5/11	
13	1400	4	94	1	-	14	0	4	7/10	
<i>Gutierrezia sarothrae</i>										
94	4280	11	87	2	40	0	0	0	6/5	
99	4020	10	90	0	100	0	.49	0	7/7	
04	2280	9	91	0	-	0	0	0	8/8	
09	1100	2	98	0	-	0	0	5	5/5	
13	680	35	65	0	80	0	0	0	5/5	
<i>Juniperus osteosperma</i>										
94	0	0	0	-	-	0	0	0	-/-	
99	20	100	0	-	-	0	0	0	-/-	
04	20	100	0	-	-	0	0	0	-/-	
09	20	100	0	-	-	100	0	100	-/-	
13	60	67	33	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
94	40	0	100	-	-	0	0	0	1/2	
99	40	0	100	-	-	0	0	0	-/-	
04	20	0	100	-	-	0	0	0	4/15	
09	20	0	100	-	-	0	0	0	-/-	
13	40	50	50	-	-	0	0	0	5/13	
<i>Pediocactus simpsonii</i>										
94	0	0	0	-	-	0	0	0	2/3	
99	40	0	100	-	-	0	0	0	2/3	
04	20	0	100	-	-	0	0	0	1/2	
09	20	0	100	-	-	0	0	0	1/4	
13	40	0	100	-	-	0	0	0	1/2	



Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Pinus edulis</b>									
94	0	0	0	-	-	0	0	0	-/-
99	280	93	7	-	140	0	0	0	-/-
04	280	57	43	-	80	0	0	0	-/-
09	260	23	77	-	100	0	0	0	-/-
13	300	60	40	-	100	0	0	0	-/-
<b>Purshia tridentata</b>									
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	0/2
<b>Ribes sp.</b>									
94	0	0	0	-	-	0	0	0	26/35
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Symphoricarpos oreophilus</b>									
94	120	0	100	0	-	0	17	0	15/23
99	280	21	71	7	40	7	0	7	16/28
04	300	40	53	7	-	0	0	7	16/25
09	180	11	89	0	-	0	78	0	5/14
13	240	17	83	0	-	25	0	0	12/25
<b>Tetradymia canescens</b>									
94	520	12	85	4	-	0	0	8	10/17
99	580	21	59	21	40	14	3	7	10/15
04	660	39	55	6	-	6	0	0	11/18
09	480	8	79	13	60	8	8	8	5/7
13	460	22	70	9	-	9	0	13	7/9
<b>Yucca harrimaniae</b>									
94	0	0	0	-	-	0	0	0	-/-
99	180	0	100	-	-	0	0	0	13/16
04	240	17	83	-	-	0	0	0	7/12
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	3/8

POLK CREEK - TREND STUDY NO. 25B-5



**Location Information**

USGS 7.5 min Map Info Flat Top; Township 27S, Range 5E, Section 7  
 GPS (0' Stake) NAD 83, UTM Zone 12, 463910 East 4257980 North

**Transect Information**

Browse Tag # (0' Stake) 7060  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

Travel north from Fremont on SR 72 for 7.3 miles to the Elkhorn-Torrey Road. Turn right and go 2.9 miles to a cattleguard. From the cattleguard go 1.75 miles to an intersection by Heart Lake. Take the right fork (#206) and go 0.4 miles toward Cathedral Valley. At the intersection, turn left (#22) toward Cathedral Valley. Proceed 0.5 miles to another fork (Round Lake turnoff). Stay right and go 2.6 miles to a cattleguard. From the cattleguard, proceed 0.6 miles down to Polk Creek. Immediately after crossing the creek, turn right on the Polk Creek Trail. Go 0.3 miles past a camp and some corrals on your left to another creek. Cross the creek, then look 110 feet beyond the creek (along the left fork of the road) for a steel rebar witness post on the left side of the road. The frequency baseline of the study starts 84 feet east (81°M) of the witness post. The 0-foot baseline stake has an attached red browse tag #7060.

**Site Information**

Land Ownership USFS  
 Allotment Thousand Lake  
 Elevation 8,400ft (2,560m)  
 Aspect Northeast  
 Slope 0-10%  
 Sample Dates 09/13/1985, 06/18/1991, 07/19/1994, 08/25/1999, 08/25/2004, 08/17/2009, 08/20/2013

**Habitat and Vegetation and Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter;

VEGETATION HISTORY--

Management unit 25B, Study no: 5

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-1991	Bitterbrush/Black Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
1994-2013	Bitterbrush/Black Sagebrush/Pinyon-Juniper	Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

There was a high presence of deer on the site in 2004 and 2009 as recorded by the pellet groups (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Black Sagebrush)  
 NRCS Ecological Site # R047XB420UT

SOIL ANALYSIS DATA--

Management unit 25B, Study no: 5

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	53.8	22.5	23.6	6.8	0.5	2.2	12.7	198.4	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since established in 1985, the site has been a mixed stand of antelope bitterbrush (*Purshia tridentata*) and black sagebrush (*Artemisia nova*) with a diverse component of other shrub species present which provided limited cover (Table - Browse Trends). Native perennial grass species have made up the majority of the herbaceous understory. Forbs have fluctuated over the sample years, but have mostly been a minor component of the herbaceous understory (Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have increased both in density and cover over the sample years and have been a major component on this site (Table - Point-Quarter Tree Data, Table - Browse Trends). Without treatment or fire, pinyon and juniper will likely continue to increase in abundance on the site, which may have a detrimental effect on the shrubs and herbaceous component of the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25B, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	30.0	8.6	1.5	9.5	0.0	3.9	0.0	<b>53.4</b>	Fair
1999	30.0	8.8	6.7	18.7	0.0	10.0	0.0	<b>74.2</b>	Good
2004	30.0	8.6	2.6	17.4	0.0	3.4	0.0	<b>62.0</b>	Fair
2009	24.4	5.5	4.0	11.1	0.0	1.7	0.0	<b>46.8</b>	Poor
2013	29.2	8.1	3.4	16.8	0.0	4.0	0.0	<b>61.4</b>	Fair

## HERBACEOUS TRENDS--

Management unit 25B, Study no: 5

Type	Species	Nested Frequency					Average Cover %				
		'94	'99	'04	'09	'13	'94	'99	'04	'09	'13
G	Agropyron smithii	3	16	4	9	15	.03	.13	.07	.08	.21
G	Bouteloua gracilis	b <sub>114</sub>	a <sub>76</sub>	a <sub>65</sub>	ab <sub>98</sub>	b <sub>117</sub>	1.81	1.50	1.33	2.70	3.28
G	Carex sp.	ab <sub>93</sub>	b <sub>118</sub>	b <sub>110</sub>	a <sub>69</sub>	ab <sub>88</sub>	1.01	3.33	2.84	1.00	2.16
G	Festuca ovina	-	10	5	-	10	-	.21	.02	-	.21
G	Oryzopsis hymenoides	-	-	-	2	-	-	-	.00	.15	-
G	Poa fendleriana	b <sub>38</sub>	a <sub>7</sub>	a <sub>6</sub>	ab <sub>21</sub>	a <sub>12</sub>	.51	.10	.07	.19	.24
G	Sitanion hystrix	c <sub>125</sub>	bc <sub>103</sub>	c <sub>112</sub>	a <sub>62</sub>	ab <sub>58</sub>	1.26	2.81	2.57	.83	1.04
G	Sporobolus cryptandrus	8	-	-	-	-	.04	-	-	-	-
G	Stipa comata	a <sub>7</sub>	ab <sub>38</sub>	ab <sub>31</sub>	ab <sub>37</sub>	b <sub>40</sub>	.04	.94	1.77	.58	1.23
G	Stipa lettermani	-	5	-	-	-	-	.30	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		388	373	333	298	340	4.73	9.34	8.71	5.55	8.39
Total for Grasses		388	373	333	298	340	4.73	9.34	8.71	5.55	8.39
F	Alyssum alyssoides (a)	-	-	2	-	-	-	-	.00	-	-
F	Androsace septentrionalis (a)	-	1	1	-	-	-	.00	.03	-	-
F	Antennaria sp.	3	-	1	1	4	.01	-	.03	.00	.15
F	Arabis demissa	ab <sub>2</sub>	b <sub>16</sub>	ab <sub>3</sub>	a <sub>-</sub>	ab <sub>5</sub>	.00	.17	.04	-	.01
F	Artemisia dracunculus	-	-	1	-	-	-	-	.00	-	-
F	Artemisia ludoviciana	-	1	-	-	-	-	.00	-	-	-
F	Aster sp.	-	3	8	10	4	-	.00	.07	.02	.00
F	Astragalus convallarius	-	-	-	-	1	-	-	-	-	.03
F	Astragalus sp.	8	-	2	-	3	.01	-	.03	-	.01
F	Castilleja chromosa	1	-	-	-	-	.00	-	-	-	-
F	Chaenactis douglasii	1	-	2	-	-	.00	-	.00	-	-
F	Chenopodium album (a)	-	2	-	-	-	-	.00	-	-	-
F	Comandra pallida	b <sub>16</sub>	ab <sub>14</sub>	a <sub>-</sub>	a <sub>3</sub>	a <sub>5</sub>	.18	.42	-	.00	.06
F	Cryptantha sp.	b <sub>41</sub>	a <sub>14</sub>	a <sub>7</sub>	a <sub>2</sub>	a <sub>5</sub>	.32	.07	.04	.01	.04
F	Cymopterus sp.	-	-	-	-	2	-	-	-	-	.00
F	Descurainia pinnata (a)	-	9	-	-	3	-	.02	-	-	.15
F	Erigeron pumilus	21	16	8	9	7	.10	.11	.02	.01	.06

Type	Species	Nested Frequency					Average Cover %				
		'94	'99	'04	'09	'13	'94	'99	'04	'09	'13
F	<i>Eriogonum alatum</i>	a <sup>-</sup>	ab <sup>7</sup>	b <sup>8</sup>	a <sup>-</sup>	ab <sup>11</sup>	-	.12	.12	-	.09
F	<i>Eriogonum cernuum</i> (a)	1	-	-	-	-	.00	-	-	-	-
F	<i>Eriogonum racemosum</i>	17	29	18	20	30	.04	.53	.27	.13	.33
F	<i>Gayophytum ramosissimum</i> (a)	1	7	2	-	-	.00	.06	.01	-	-
F	<i>Hymenoxys richardsonii</i>	b <sup>26</sup>	a <sup>15</sup>	a <sup>3</sup>	a <sup>7</sup>	a <sup>4</sup>	.41	.45	.03	.10	.06
F	<i>Lepidium sp.</i> (a)	a <sup>-</sup>	b <sup>8</sup>	ab <sup>2</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.02	.00	-	-
F	<i>Lithospermum incisum</i>	-	-	-	-	6	.00	-	-	-	.03
F	<i>Lygodesmia spinosa</i>	32	25	25	28	28	.70	1.16	.71	.49	.74
F	<i>Machaeranthera canescens</i>	a <sup>5</sup>	b <sup>25</sup>	a <sup>2</sup>	a <sup>5</sup>	ab <sup>7</sup>	.04	.20	.03	.01	.07
F	<i>Microsteris gracilis</i> (a)	-	-	12	-	-	-	-	.04	-	-
F	<i>Oenothera sp.</i>	1	-	-	-	2	.00	-	-	-	.00
F	<i>Penstemon comarrhenus</i>	-	-	-	-	2	-	-	-	-	.00
F	<i>Penstemon humilis</i>	4	3	4	6	8	.03	.03	.03	.04	.09
F	<i>Phlox longifolia</i>	b <sup>10</sup>	b <sup>14</sup>	ab <sup>4</sup>	a <sup>-</sup>	b <sup>22</sup>	.03	.06	.01	-	.06
F	<i>Polygonum douglasii</i> (a)	3	1	4	4	-	.01	.00	.00	.00	-
F	<i>Senecio multilobatus</i>	a <sup>1</sup>	c <sup>64</sup>	b <sup>19</sup>	a <sup>1</sup>	ab <sup>10</sup>	.00	1.71	.19	.03	.10
F	<i>Sphaeralcea coccinea</i>	1	4	2	-	-	.03	.03	.03	-	.00
F	<i>Taraxacum officinale</i>	-	3	-	-	-	-	.00	-	-	-
F	<i>Tragopogon dubius</i> (a)	-	3	4	-	3	-	.00	.01	-	.00
Total for Annual Forbs		5	31	27	4	6	0.01	0.12	0.10	0.00	0.15
Total for Perennial Forbs		190	253	117	92	166	1.94	5.10	1.69	0.87	1.99
Total for Forbs		195	284	144	96	172	1.96	5.23	1.80	0.87	2.14

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

#### BROWSE TRENDS--

Management unit 25B, Study no: 5

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'99	'04	'09	'13	'04	'09	'13
B	<i>Artemisia nova</i>	15.72	14.35	9.55	5.26	6.77	9.26	7.05	8.88
B	<i>Artemisia tridentata vaseyana</i>	.53	.84	.93	.16	1.50	.63	1.23	1.46
B	<i>Ceratoides lanata</i>	.00	.00	.00	-	-	-	-	-
B	<i>Chrysothamnus depressus</i>	.12	.15	.40	.19	.98	.70	.31	1.16
B	<i>Chrysothamnus nauseosus</i>	.72	.09	.71	.07	.15	1.41	.76	.61
B	<i>Chrysothamnus parryi</i>	-	-	-	-	.15	-	-	-
B	<i>Chrysothamnus viscidiflorus lanceolatus</i>	1.80	1.43	1.33	1.31	1.43	2.75	2.36	4.26
B	<i>Coryphantha vivipara arizonica</i>	-	-	-	-	.03	-	-	.03
B	<i>Gutierrezia sarothrae</i>	.10	.16	1.71	.70	.30	1.25	.46	.15
B	<i>Juniperus osteosperma</i>	-	.63	.15	.38	.15	1.46	.66	1.23
B	<i>Opuntia sp.</i>	.18	.15	.15	.18	.19	.48	.03	.25
B	<i>Pediocactus simpsonii</i>	-	.00	-	.01	-	-	-	-
B	<i>Pinus edulis</i>	4.33	5.49	7.28	8.61	9.33	12.68	14.73	19.85
B	<i>Purshia tridentata</i>	10.00	15.23	13.23	11.61	11.73	18.33	16.70	15.48

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'99	'04	'09	'13	'04	'09	'13
B	<i>Symphoricarpos oreophilus</i>	-	.41	.38	.16	.18	.75	.76	.45
B	<i>Tetradymia canescens</i>	.44	.79	.85	.22	.36	.61	.38	.36
B	<i>Yucca</i> sp.	-	-	.03	-	.00	.03	-	-
Total for Browse		33.96	39.76	36.74	28.90	33.33	50.34	45.43	54.17

POINT-QUARTER TREE DATA--

Management unit 25B, Study no: 5

Species	Trees per Acre				Average diameter (in)			
	'99	'04	'09	'13	'99	'04	'09	'13
<i>Juniperus osterosperma</i>	46	51	57	52	2.0	2.1	2.6	2.5
<i>Pinus edulis</i>	199	236	244	211	2.5	2.8	3.2	3.3
<i>Pinus ponderosa</i>	19	<18	<18	<18	5.9	-	-	-

BASIC COVER--

Management unit 25B, Study no: 5

Cover Type	Average Cover %				
	'94	'99	'04	'09	'13
Vegetation	38.57	48.68	42.66	39.00	43.35
Rock	17.39	18.85	18.57	17.08	15.27
Pavement	9.53	8.58	10.69	9.17	7.85
Litter	30.89	43.84	38.29	44.44	40.57
Cryptogams	.05	.15	.11	.07	.19
Bare Ground	13.78	8.48	9.40	11.02	11.00

PELLET GROUP DATA--

Management unit 25B, Study no: 5

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	23	32	15	23	3	-	-	-	-
Elk	7	2	3	7	3	1 (2)	5 (12)	8 (17)	3 (7)
Deer	23	9	23	24	18	20 (49)	66 (162)	70 (174)	32 (79)
Cattle	4	7	-	1	3	7 (18)	6 (14)	2 (5)	9 (22)
Moose	-	-	-	-	-	-	1 (2)	-	-

BROWSE CHARACTERISTICS--  
Management unit 25B, Study no: 5

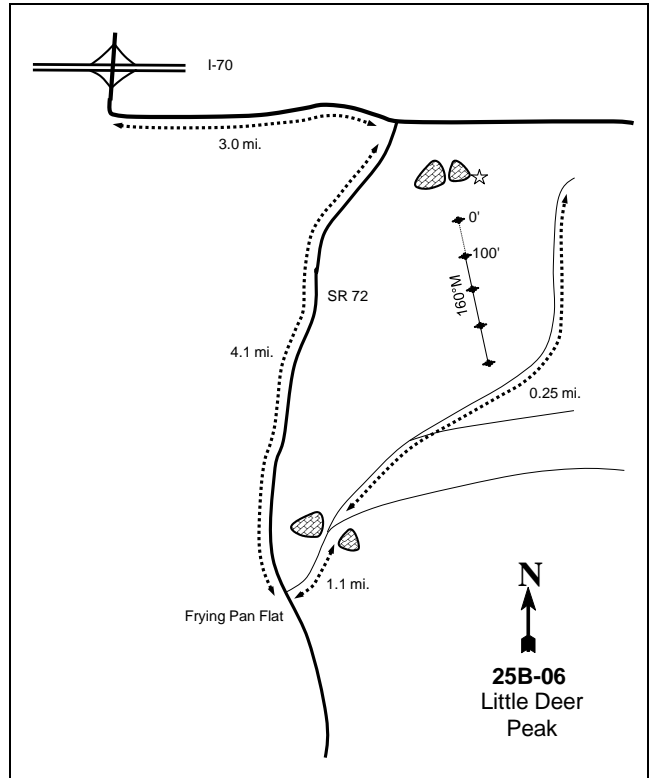
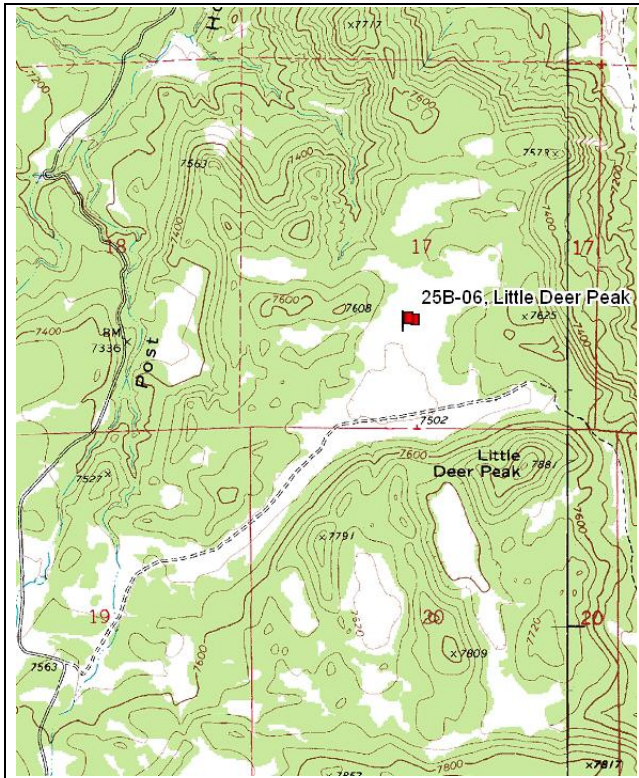
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<i>Artemisia nova</i>									
94	<b>9120</b>	5	61	34	5120	7	0	9	10/21
99	<b>9160</b>	16	50	33	800	20	2	11	11/19
04	<b>7120</b>	11	58	31	2620	8	0	19	9/16
09	<b>7340</b>	23	60	17	60	2	.81	11	8/14
13	<b>5320</b>	12	74	14	400	29	9	12	9/16
<i>Artemisia tridentata vaseyana</i>									
94	<b>100</b>	0	100	0	-	0	0	0	21/30
99	<b>300</b>	33	60	7	40	7	0	0	20/27
04	<b>360</b>	22	56	22	620	22	0	11	15/20
09	<b>680</b>	35	56	9	-	9	0	0	12/16
13	<b>540</b>	15	78	7	40	0	4	4	13/23
<i>Ceratoides lanata</i>									
94	<b>60</b>	0	100	0	-	0	0	0	6/4
99	<b>100</b>	0	80	20	-	20	80	0	5/6
04	<b>80</b>	50	25	25	-	0	50	25	5/5
09	<b>60</b>	0	100	0	-	0	0	0	3/1
13	<b>60</b>	67	33	0	40	33	0	33	5/4
<i>Chrysothamnus depressus</i>									
94	<b>420</b>	0	100	0	-	0	0	0	5/10
99	<b>480</b>	4	96	0	-	21	25	0	4/7
04	<b>720</b>	0	92	8	-	17	42	8	7/11
09	<b>400</b>	5	80	15	-	0	15	10	3/7
13	<b>760</b>	3	97	0	-	13	21	0	5/11
<i>Chrysothamnus nauseosus</i>									
94	<b>240</b>	0	50	50	-	0	0	8	15/19
99	<b>220</b>	18	55	27	-	9	9	0	22/28
04	<b>500</b>	20	52	28	-	16	0	20	17/18
09	<b>180</b>	0	78	22	20	11	0	11	14/13
13	<b>220</b>	0	73	27	-	0	0	27	23/28
<i>Chrysothamnus parryi</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>80</b>	50	50	-	-	0	75	75	7/13

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Chrysothamnus viscidiflorus lanceolatus</i>										
94	2120	5	92	3	60	0	0	0	18/27	
99	1740	5	92	3	120	1	0	1	10/15	
04	2060	14	82	5	60	8	0	3	11/15	
09	1640	4	88	9	-	2	2	10	9/12	
13	1120	5	88	7	-	20	2	14	12/18	
<i>Coryphantha vivipara arizonica</i>										
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	20	0	100	-	-	0	0	0	2/2	
09	0	0	0	-	-	0	0	0	-/-	
13	80	0	100	-	-	0	0	0	4/4	
<i>Echinocereus sp.</i>										
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	5/19	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
94	920	52	48	0	100	0	0	0	5/5	
99	580	7	93	0	360	0	0	0	7/8	
04	2820	7	93	0	20	0	0	0	8/9	
09	1820	31	69	0	-	0	0	0	7/7	
13	660	3	94	3	-	0	3	3	7/6	
<i>Juniperus osteosperma</i>										
94	0	0	0	-	-	0	0	0	-/-	
99	40	100	0	-	-	0	0	0	-/-	
04	60	67	33	-	-	0	0	0	-/-	
09	40	0	100	-	-	0	0	0	-/-	
13	60	33	67	-	-	0	0	0	-/-	
<i>Kochia prostrata</i>										
94	0	0	0	-	-	0	0	0	-/-	
99	0	0	0	-	-	0	0	0	-/-	
04	0	0	0	-	-	0	0	0	-/-	
09	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	8/12	
<i>Opuntia sp.</i>										
94	120	50	50	-	-	0	17	0	3/6	
99	80	0	100	-	-	0	0	0	5/16	
04	200	20	80	-	-	0	0	0	5/18	
09	440	5	95	-	-	0	0	91	3/7	
13	380	5	95	-	-	0	0	11	3/10	



Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Pediocactus simpsonii</b>									
94	0	0	0	-	-	0	0	0	2/3
99	60	67	33	-	-	0	0	0	-/-
04	220	27	73	-	-	0	0	0	3/3
09	60	0	100	-	-	0	0	0	2/4
13	80	25	75	-	-	0	0	0	2/3
<b>Pinus edulis</b>									
94	0	0	0	-	-	0	0	0	-/-
99	260	69	31	-	200	0	0	0	-/-
04	460	70	30	-	20	0	0	13	-/-
09	340	53	47	-	40	0	0	0	-/-
13	420	57	43	-	980	0	0	5	-/-
<b>Purshia tridentata</b>									
94	2520	0	97	3	40	2	2	0	12/36
99	1840	10	80	10	20	30	38	7	15/43
04	2980	0	85	15	-	43	52	11	16/38
09	3460	1	60	39	20	17	67	35	13/37
13	2220	3	65	32	-	61	35	54	14/40
<b>Ribes sp.</b>									
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	20/68
<b>Symphoricarpos oreophilus</b>									
94	120	17	83	-	-	0	0	0	13/23
99	140	0	100	-	-	29	0	0	19/26
04	140	14	86	-	-	0	0	0	11/21
09	220	0	100	-	-	27	0	18	14/24
13	200	30	70	-	-	60	0	30	15/37
<b>Tetradymia canescens</b>									
94	480	8	83	8	-	0	0	4	9/11
99	700	20	66	14	-	14	3	3	9/10
04	600	17	73	10	20	23	0	3	10/13
09	540	7	70	22	-	30	15	15	8/9
13	500	12	68	20	-	16	0	20	11/13
<b>Yucca sp.</b>									
94	0	0	0	-	-	0	0	0	-/-
99	0	0	0	-	-	0	0	0	-/-
04	20	100	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	3/4
13	0	0	0	-	-	0	0	0	2/3

## LITTLE DEER PEAK - TREND STUDY NO. 25B-6



### Location Information

USGS 7.5 min Map Info      Johns Peak; Township 24S, Range 5E, Section 17  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 466614 East 4285760 North

### Transect Information

Browse Tag # (0' Stake)      7082  
 Transect Bearing              160° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

### Directions to Site

From Salina, go 37.5 miles east on I-70 to a rest area. From the rest area, go approximately 3 miles east on the frontage road to Fremont Junction. Turn south on SR 72 and drive 4.1 miles to a left turn across from Frying Pan Flat. Go left down this road for 1.1 miles to a fork between 2 large boulders. Take the left fork 0.05 miles to another fork. Go left 0.2 miles to a large split boulder which is 200 feet to the left of the road. The 0-foot baseline stake is 15 feet south of the split boulder and has an attached red browse tag #7082.

**Site Information**

Land Ownership BLM  
 Allotment Deer Peak  
 Elevation 7,500ft (2,286m)  
 Aspect Flat  
 Slope 0-3%  
 Sample Dates 07/17/1985, 06/12/1991, 08/17/1999, 08/24/2004, 08/26/2009, 08/21/2013

**Habitat and Vegetation and Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Opportunity Not Winter

VEGETATION HISTORY--

Management unit 25B, Study no: 6

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) are scrubby and stunted, looking similar to black sagebrush (*A. nova*). The area surrounding the sagebrush flat is a pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodland.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R034XY306UT

SOIL ANALYSIS DATA--

Management unit 25B, Study no: 6

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	49.8	25.2	24.9	7.3	0.5	1.4	13.1	153.6	1999

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1985, the site has been in a stable state of Wyoming big sagebrush with a herbaceous understory dominated by blue grama (*Bouteloa gracilis*) (Appendix B -Pre-1992 Data) (Table - Browse Trends). Other grass and forb species have occurred in low to sparse abundance on the site over the sample periods (Table - Herbaceous Trends)

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25B, study no: 6

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1999	17.5	6.1	5.5	30.0	0.0	3.0	0.0	<b>62.1</b>	Good
2004	16.2	6.5	0.5	30.0	0.0	2.5	0.0	<b>55.7</b>	Good
2009	12.4	-2.1	1.5	22.1	0.0	0.3	0.0	<b>34.3</b>	Fair
2013	15.1	8.7	7.5	30.0	0.0	1.4	0.0	<b>62.7</b>	Good

## HERBACEOUS TRENDS--

Management unit 25B, Study no: 6

Type	Species	Nested Frequency				Average Cover %			
		'99	'04	'09	'13	'99	'04	'09	'13
G	Agropyron cristatum	a-	c37	b18	d67	.00	.90	.13	1.53
G	Bouteloua gracilis	326	328	331	295	14.20	14.64	10.19	12.71
G	Carex sp.	-	-	-	3	-	-	-	.03
G	Oryzopsis hymenoides	a-	a1	b27	a3	-	.00	.37	.09
G	Sitanion hystrix	c209	b142	a49	a74	2.71	2.76	.36	1.10
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		535	508	425	442	16.92	18.31	11.06	15.46
Total for Grasses		535	508	425	442	16.92	18.31	11.06	15.46
F	Arabis demissa	7	-	-	5	.01	-	-	.01
F	Astragalus miser	-	-	-	1	-	-	-	.03
F	Chenopodium fremontii (a)	a-	b14	ab5	a-	-	.03	.02	-
F	Chenopodium leptophyllum(a)	a-	b28	a-	a-	-	.08	-	-
F	Descurainia pinnata (a)	-	4	-	-	-	.00	-	-
F	Draba sp. (a)	1	-	-	-	.00	-	-	-
F	Erigeron pumilus	ab8	b21	a7	b24	.07	.17	.02	.30
F	Gayophytum ramosissimum(a)	-	4	-	-	-	.00	-	-
F	Penstemon comarrhenus	-	1	-	2	-	.03	-	.03
F	Penstemon sp.	2	-	-	-	.00	-	-	-
F	Sanguisorba minor	-	1	-	-	-	.00	-	-
F	Sphaeralcea coccinea	b166	b118	a49	a74	1.43	1.03	.14	.32
Total for Annual Forbs		1	50	5	0	0.00	0.12	0.02	0
Total for Perennial Forbs		183	141	56	106	1.52	1.24	0.16	0.69
Total for Forbs		184	191	61	106	1.53	1.37	0.18	0.69

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

BROWSE TRENDS--

Management unit 25B, Study no: 6

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'99	'04	'09	'13	'04	'09	'13
B	Artemisia frigida	.09	.33	.00	.03	.23	-	.13
B	Artemisia tridentata wyomingensis	13.94	12.68	9.93	12.07	16.69	9.38	14.03
B	Chrysothamnus viscidiflorus viscidiflorus	1.35	2.10	1.00	2.21	6.31	.88	3.15
B	Gutierrezia sarothrae	1.60	2.33	-	.04	2.63	-	.03
B	Leptodactylon pungens	-	-	.00	-	-	-	-
B	Opuntia sp.	.01	.06	.07	.16	.08	.25	.16
B	Pediocactus simpsonii	-	.02	.01	.01	-	-	-
Total for Browse		17.00	17.53	11.04	14.53	25.94	10.51	17.5

BASIC COVER--

Management unit 25B, Study no: 6

Cover Type	Average Cover %			
	'99	'04	'09	'13
Vegetation	34.75	36.80	25.79	30.78
Rock	2.86	2.89	2.04	2.42
Pavement	4.82	7.90	3.34	3.47
Litter	23.83	24.63	34.11	31.62
Cryptogams	1.10	2.19	1.85	2.05
Bare Ground	38.14	41.32	33.46	44.17

PELLET GROUP DATA--

Management unit 25B, Study no: 6

Type	Quadrat Frequency				Days use per acre (ha)			
	'99	'04	'09	'13	'99	'04	'09	'13
Rabbit	41	20	56	11	-	-	-	-
Elk	17	8	24	20	44 (100)	21 (53)	11 (26)	25 (63)
Deer	12	8	11	10	31 (76)	3 (8)	25 (63)	11 (28)
Cattle	1	1	-	-	7 (18)	4 (11)	2 (5)	2 (4)

BROWSE CHARACTERISTICS--

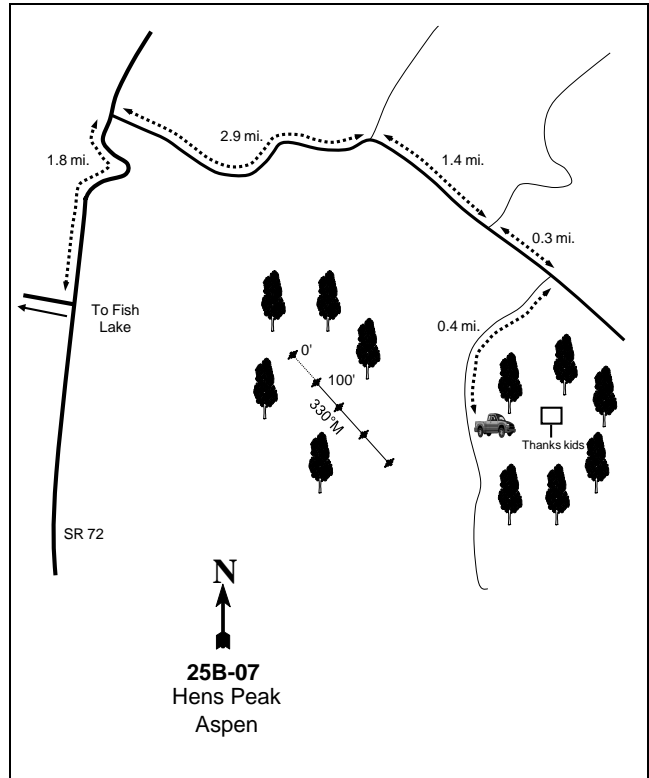
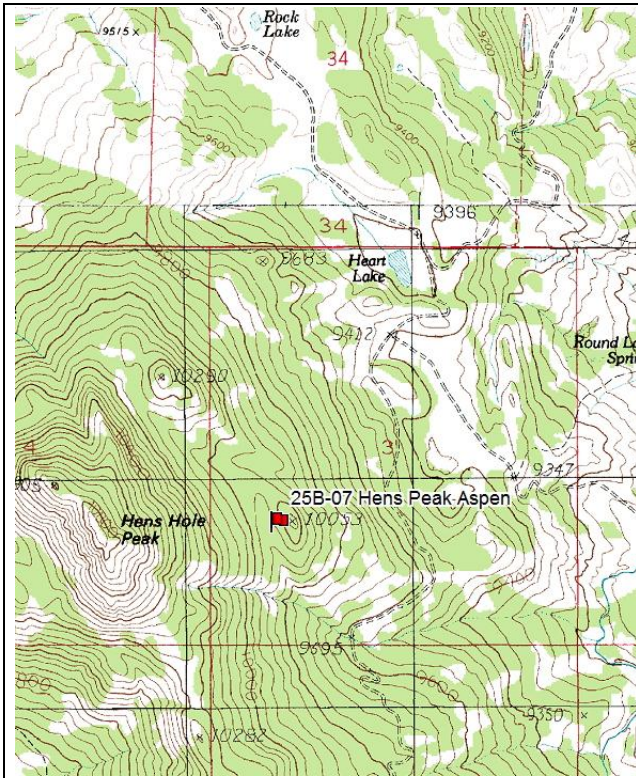
Management unit 25B, Study no: 6

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Artemisia frigida									
99	300	13	87	-	100	13	13	0	5/5
04	160	0	100	-	-	0	0	0	7/9
09	20	0	100	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	100	-/-

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 nova</i>									
99	<b>100</b>	0	0	100	-	0	0	100	-/-
04	<b>0</b>	0	0	0	-	0	0	0	-/-
09	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Artemisia tridentata wyomingensis</i>									
99	<b>6200</b>	11	59	30	180	35	2	6	12/24
04	<b>6220</b>	1	70	29	20	21	26	13	13/25
09	<b>5220</b>	3	40	57	400	24	29	46	12/24
13	<b>5740</b>	15	64	21	220	38	53	64	13/25
<i>Cercocarpus ledifolius</i>									
99	<b>0</b>	0	0	-	-	0	0	0	-/-
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>40</b>	100	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
99	<b>3540</b>	7	85	8	-	5	0	7	6/10
04	<b>3300</b>	1	98	1	-	0	0	.60	9/14
09	<b>2340</b>	1	34	65	-	22	27	66	4/9
13	<b>3580</b>	8	80	11	-	37	5	78	6/12
<i>Echinocereus triglochidatus</i>									
99	<b>100</b>	20	80	-	-	0	0	0	1/3
04	<b>0</b>	0	0	-	-	0	0	0	-/-
09	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>40</b>	0	100	-	-	0	0	0	1/2
<i>Gutierrezia sarothrae</i>									
99	<b>2940</b>	6	94	0	340	.68	0	0	6/9
04	<b>2820</b>	0	100	0	-	0	0	0	7/9
09	<b>100</b>	0	80	20	-	0	0	20	4/5
13	<b>240</b>	42	42	17	-	0	0	17	3/4
<i>Leptodactylon pungens</i>									
99	<b>80</b>	0	75	25	-	0	0	25	5/7
04	<b>120</b>	0	100	0	-	0	0	0	5/7
09	<b>60</b>	0	67	33	20	0	0	33	3/4
13	<b>60</b>	0	100	0	-	0	67	67	6/13
<i>Opuntia sp.</i>									
99	<b>380</b>	11	84	5	40	0	0	11	3/9
04	<b>320</b>	6	94	0	-	0	0	0	2/7
09	<b>220</b>	27	55	18	-	0	0	27	2/6
13	<b>240</b>	33	67	0	-	0	0	0	2/5

		Age class distribution						Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)		
Pediocactus simpsonii											
99	<b>40</b>	100	0	-	-	0	0	0	1/3		
04	<b>160</b>	13	88	-	-	0	0	0	1/2		
09	<b>80</b>	25	75	-	20	0	0	0	0/1		
13	<b>220</b>	9	91	-	-	0	0	0	1/2		

HENS PEAK ASPEN - TREND STUDY NO. 25B-7



**Location Information**

USGS 7.5 min Map Info Flat Top; Township 27S, Range 4E, Section 3  
 GPS (0' Stake) NAD 83, UTM Zone 12, 459800 East 4260171 North

**Transect Information**

Browse Tag # (0' Stake) \*600  
 Transect Bearing 330° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement No Rebar

**Directions to Site**

Travel north out of Fremont on Highway 72 until the turnoff for Fish Lake (approximately 5 miles). Continue on Highway 72 for another 1.8 miles. Turn right onto Elkhorn Rd and go approximately 2.9 miles to an intersection (stay on the Elkhorn Rd for 5 miles to study site). Stay right and proceed for 1.4 miles to another intersection and stay right. Go another 0.3 miles to another intersection and stay right. In 0.4 miles you will come to an aspen rejuvenation sign. Park the truck here. The transect is adjacent to the west side of the road.

\*The 400 foot stake is marked with browse tag #600.



### Site Information

Land Ownership USFS  
Allotment Solomon  
Elevation 9,555ft (2,912m)  
Aspect Southeast  
Slope 10%  
Sample Dates 08/20/2013

### DISTURBANCE HISTORY--

Management unit 25B, Study no: 7

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Fire	Hens Peak	-	July 1996	630
Seeding	-	-	1996?	-

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer, Calving

### VEGETATION HISTORY--

Management unit 25B, Study no: 7

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>
2013	Quaking Aspen

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

### Site Notes

Soil data was not taken for this site. The site appears to have been seeded due to the presence of seeded species being sampled on the site. It was probably seeded following the fire in 1996.

### Site Potential

1981-2010 Average Annual Precipitation 24 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site High Mountain Stony Loam (Aspen)  
NRCS Ecological Site # R047XB531UT

### States and Transitions

No state and transition model is available for the above ecological site.

When established in 2013, the site was a young stand of aspen with young conifer trees scattered throughout the understory (Table - Browse Trends, Table - Browse Characteristics). The aspen stand burned in 1996, which removed all the old mature trees in the stand (Table - Disturbance History). The herbaceous understory was diverse, though only a few species provided much cover (Table - Herbaceous Trends). The shrub component was somewhat diverse and was dominated by snowberry (*Symphoricarpos oreophilus*). With the presence of the young conifer trees, the site has the potential to transition into a conifer dominated state, but due to the stands age it not likely for some time.

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 25B, Study no: 7

Type	Species	Nested	Average
		Frequency	Cover %
		'13	'13
G	Agropyron smithii	8	.04
G	Agropyron trachycaulum	2	.03
G	Bromus carinatus	26	.93
G	Bromus inermis	18	.51
G	Bromus tectorum (a)	40	.18
G	Carex sp.	47	.88
G	Festuca ovina	10	.07
G	Hordeum jubatum	12	.09
G	Phleum alpinum	5	.15
G	Poa fendleriana	47	1.08
G	Poa pratensis	91	2.99
G	Sitanion hystrix	52	.99
G	Stipa comata	13	.31
G	Stipa lettermani	27	.20
Total for Annual Grasses		40	0.18
Total for Perennial Grasses		358	8.31
Total for Grasses		398	8.49
F	Androsace septentrionalis (a)	10	.02
F	Antennaria sp.	5	.18
F	Arabis sp.	22	.05
F	Artemesia carruthii	5	.15
F	Aster sp.	2	.03
F	Chaenactis douglasii	13	.08
F	Collinsia parviflora (a)	2	.00
F	Cryptantha sp.	4	.04
F	Cymopterus sp.	3	.03
F	Descurainia pinnata (a)	3	.00
F	Draba sp. (a)	2	.00
F	Dracocephalum parviflorum	56	.95
F	Erigeron flagellaris	107	4.69
F	Eriogonum alatum	21	.04
F	Eriogonum racemosum	2	.03
F	Fragaria virginiana	5	.18
F	Hymenoxys sp.	12	.10
F	Lappula occidentalis (a)	8	.18
F	Lupinus argenteus	17	.34
F	Machaeranthera canescens	31	.40
F	Mentha arvensis	10	.05
F	Penstemon humilis	6	.04
F	Potentilla gracilis	6	.04
F	Senecio multilobatus	21	.09

Type	Species	Nested Frequency	Average Cover %
		'13	'13
F	Taraxacum officinale	136	1.96
F	Tragopogon dubius (a)	2	.00
F	Viguiera multiflora	7	.10
Total for Annual Forbs		27	0.22
Total for Perennial Forbs		491	9.62
Total for Forbs		518	9.84

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

#### BROWSE TRENDS--

Management unit 25B, Study no: 7

Type	Species	Quadrat Cover %	Line Intercept Cover %
		'13	'13
B	Abies concolor	.79	2.50
B	Artemisia tridentata vaseyana	.15	.06
B	Chrysothamnus parryi	.33	.43
B	Chrysothamnus viscidiflorus viscidiflorus	.18	.03
B	Mahonia repens	.03	.15
B	Picea engelmannii	1.14	.01
B	Pinus ponderosa	.38	1.60
B	Populus tremuloides	6.10	47.13
B	Ribes sp.	.21	-
B	Rosa woodsii	.03	-
B	Symphoricarpos oreophilus	2.39	3.44
Total for Browse		11.75	55.35

#### POINT-QUARTER TREE DATA--

Management unit 25B, Study no: 7

Species	Trees per Acre	Average diameter (in)
	'13	'13
Abies concolor	27	1.3
Picea engelmannii	32	1.7
Pinus ponderosa	37	1.6
Populus tremuloides	844	3.4
Pseudotsuga menziesii	29	3.6

BASIC COVER--

Management unit 25B, Study no: 7

Cover Type	Average Cover % '13
Vegetation	32.01
Rock	4.81
Pavement	17.69
Litter	51.00
Bare Ground	8.18

PELLET GROUP DATA--

Management unit 25B, Study no: 7

Type	Quadrat Frequency '13	Days use per acre (ha) '13
Rabbit	3	-
Deer	3	6 (15)
Cattle	3	23 (57)
Elk	-	3 (8)

BROWSE CHARACTERISTICS--

Management unit 25B, Study no: 7

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>Abies concolor</i>									
13	160	100	0	-	60	13	0	25	-/-
<i>Artemisia tridentata vaseyana</i>									
13	60	67	33	-	-	33	0	33	18/28
<i>Chrysothamnus nauseosus</i>									
13	0	0	0	-	-	0	0	0	9/9
<i>Chrysothamnus parryi</i>									
13	140	0	100	-	-	14	0	0	11/16
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
13	280	14	79	7	-	57	7	14	8/10
<i>Mahonia repens</i>									
13	160	0	100	-	-	0	0	0	2/4
<i>Picea engelmannii</i>									
13	60	100	0	-	-	0	0	33	-/-
<i>Pinus ponderosa</i>									
13	120	100	0	-	-	0	0	33	-/-
<i>Populus tremuloides</i>									
13	2160	20	35	44	340	4	0	13	1/-

		Age class distribution			Utilization				
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Ribes sp.									
13	<b>80</b>	50	0	50	-	0	0	25	35/33
Rosa woodsii									
13	<b>160</b>	100	0	-	-	0	0	0	16/17
Symphoricarpos oreophilus									
13	<b>340</b>	12	88	-	-	24	0	0	22/48

# WILDLIFE MANAGEMENT UNIT 25C - BOULDER

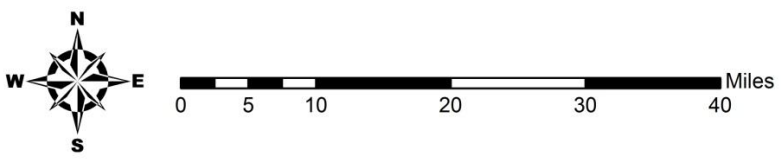
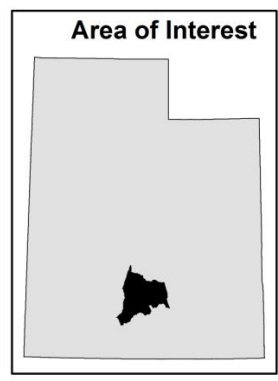


**Unit - 25C**

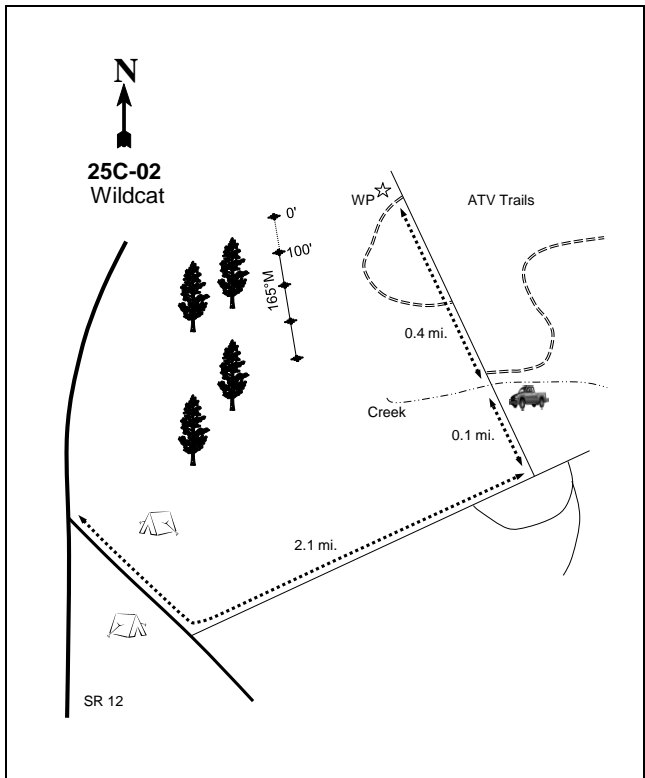
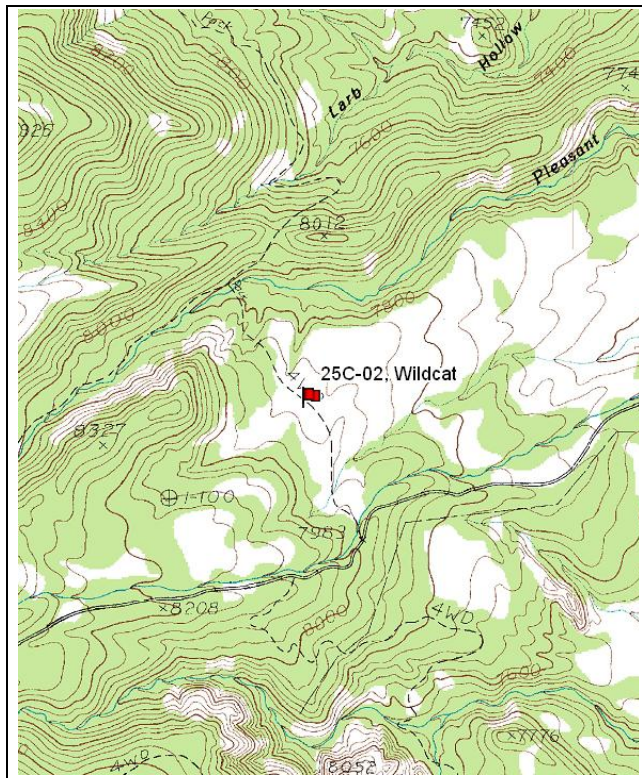
**Study Location**

**Project, Status**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active
- ★ WRI, Suspended



WILDCAT - TREND STUDY NO. 25C-2



**Location Information**

USGS 7.5 min Map Info Lower Bowns Reservoir; Township 31S, Range 5E, Section 13  
 GPS (0' Stake) NAD 83, UTM Zone 12, 473193 East 4217862 North

**Transect Information**

Browse Tag # (0' Stake) 7116  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

On SR 12 south of Torrey, go about 50 yards south of Pleasant Creek Campgrounds then turn east onto the Lower Bowns Reservoir Road. Proceed 2.1 miles and turn left. Continue 0.1 miles. From here the road is closed. Walk across the creek and down the ATV trail approximately 0.4 miles to the witness post on the left side of the road. The stakes are full-high fenceposts. The 0-foot stake is marked by browse tag #7116. Ignore the fencepost that was misplaced near the south end of the baseline.

**Site Information**

Land Ownership USFS  
 Allotment Pleasant Creek  
 Elevation 7,880ft (2,404m)  
 Aspect Northeast  
 Slope 5%  
 Sample Dates 09/01/1985, 08/26/1991, 07/26/1994, 07/21/1998, 08/19/2003, 08/21/2008, 08/14/2013

**DISTURBANCE HISTORY--**

Management unit 25C, Study no: 2

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1970	-
Seeding	-	-	1970	-
Bullhog	-	-	2003-2008	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer; Elk, Crucial Summer, Calving

**VEGETATION HISTORY--**

Management unit 25C, Study no: 2

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The study area falls in close proximity to a one-way Dixie harrow designed to retreat encroaching pinyon-juniper (WRI Project #125), but the site itself was not treated. A deer carcass was found on the site in 2003.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

**SOIL ANALYSIS DATA--**

Management unit 25C, Study no: 2

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loamy Sand	82.0	9.4	8.6	6.4	0.6	1.2	13.6	91.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since 1985, Wyoming big sagebrush has maintain a stable, robust population. Additionally, the perennial grasses crested wheatgrass (*Agropyron cristatum*) and blue grama (*Bouteloua gracilis*) have also maintained stable populations. Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) had a period of encroachment from 1994 to 2003 but have since been removed (Table - Browse Trend, Table - Herbaceous Trends). Due to the site’s proximity to PJ woodlands, encroachment will likely be an ongoing issue.



## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25C, study no: 2

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	12.2	7.6	5.5	30.0	0.0	2.4	0.0	<b>57.7</b>	Good
1998	9.8	9.9	7.4	30.0	0.0	10.0	0.0	<b>67.1</b>	Excellent
2003	15.5	8.9	1.3	30.0	0.0	7.4	0.0	<b>63.0</b>	Good
2008	13.0	6.3	9.8	30.0	0.0	10.0	0.0	<b>69.1</b>	Excellent
2013	17.9	13.5	14.5	30.0	0.0	4.3	0.0	<b>80.1</b>	Excellent

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 2

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	Agropyron cristatum	bc333	c358	b261	b267	a211	7.61	13.10	6.69	9.01	6.71
G	Aristida purpurea	-	4	3	-	-	-	.03	.00	-	-
G	Bouteloua gracilis	293	335	311	323	290	7.39	18.85	10.53	14.07	13.20
G	Sitanion hystrix	4	5	-	4	8	.01	.00	-	.06	.02
G	Sporobolus cryptandrus	3	7	-	-	1	.00	.06	-	-	.03
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		633	709	575	594	510	15.02	32.05	17.23	23.15	19.96
Total for Grasses		633	709	575	594	510	15.02	32.05	17.23	23.15	19.96
F	Allium cernuum	-	2	-	-	-	-	.00	-	-	-
F	Arabis fendleri	-	-	-	-	1	-	-	-	-	.00
F	Arenaria fendleri	a-	b29	a-	a-	a-	-	.15	-	-	-
F	Artemisia ludoviciana	-	-	-	-	3	-	-	-	-	.15
F	Astragalus sp.	-	2	-	1	1	-	.00	-	.00	.00
F	Cordylanthus kingii (a)	-	-	-	-	4	-	-	-	-	.03
F	Cryptantha sp.	a1	ab12	a-	a6	a-	.00	.02	-	.03	-
F	Descurainia pinnata (a)	1	-	11	-	9	.00	-	.02	-	.04
F	Erigeron pumilus	-	3	-	2	2	-	.00	-	.01	.00
F	Eriogonum alatum	-	-	2	-	-	-	-	.03	-	-
F	Eriogonum racemosum	19	27	31	25	29	.18	.26	.21	.31	.35
F	Gayophytum ramosissimum(a)	-	6	-	-	-	-	.01	-	-	-
F	Gilia hutchinifolia (a)	b56	a-	a-	a-	a-	.19	-	-	-	-
F	Lepidium sp. (a)	a-	b74	a-	a-	a2	-	.21	-	.00	.00
F	Lupinus argenteus	b84	c133	b97	b94	a45	.94	11.93	3.36	5.38	.96
F	Lygodesmia sp.	-	2	3	3	-	-	.00	.03	.03	-
F	Mirabilis linearis	-	-	-	-	2	-	-	-	-	.03
F	Oenothera pallida	4	22	19	15	25	.02	.23	.03	.09	.08
F	Orthocarpus luteus (a)	b20	b15	c140	b15	a-	.08	.03	1.82	.38	-
F	Penstemon sp.	1	3	3	16	15	.00	.01	.00	.10	.10
F	Phlox longifolia	b22	a6	a4	a6	a4	.05	.02	.00	.01	.00
F	Polygonum douglasii (a)	a2	b27	a-	ab17	a7	.00	.07	-	.04	.01

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
F	Senecio douglasii	a-	a-	a-	a <sup>2</sup>	b <sup>40</sup>	-	-	-	.15	.44
F	Sphaeralcea coccinea	2	1	1	1	-	.00	.00	.00	.00	-
F	Tragopogon dubius (a)	-	1	-	-	-	-	.00	-	-	-
Total for Annual Forbs		79	123	151	32	22	0.28	0.32	1.84	0.42	0.09
Total for Perennial Forbs		133	242	160	171	167	1.21	12.66	3.69	6.14	2.14
Total for Forbs		212	365	311	203	189	1.50	12.99	5.53	6.57	2.24

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 2

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	-	1.29	1.65	1.61	2.13	1.63	.10	2.63
B	Artemisia tridentata wyomingensis	9.67	6.50	10.67	8.80	12.14	14.80	13.63	20.21
B	Chrysothamnus viscidiflorus stenophyllus	.00	-	.18	-	.03	-	-	-
B	Eriogonum microthecum	.09	.06	.04	-	.01	.05	-	-
B	Gutierrezia sarothrae	.07	.07	.18	.19	.15	.20	-	.30
B	Opuntia sp.	.01	-	.03	.21	.20	.01	.11	.55
B	Pinus edulis	.30	-	-	-	-	-	-	-
B	Tetradymia canescens	.45	.21	.41	.35	.07	.13	.01	.06
Total for Browse		10.60	8.14	13.17	11.16	14.74	16.82	13.85	23.75

#### POINT-QUARTER TREE DATA--

Management unit 25C, Study no: 2

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	6	<18	<18	<18	1.2	-	-	-
Pinus edulis	8	<18	<18	<18	3.7	-	-	-

#### BASIC COVER--

Management unit 25C, Study no: 2

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	25.41	55.13	36.59	46.68	38.00
Rock	1.31	2.17	1.34	.82	.18
Pavement	2.27	3.62	2.98	6.63	.52
Litter	31.29	47.80	39.74	33.62	37.46
Cryptogams	0	0	.63	.00	.04
Bare Ground	34.78	27.63	32.24	22.64	36.68

PELLET GROUP DATA--

Management unit 25C, Study no: 2

Type	Quadrat Frequency				
	'94	'98	'03	'08	'13
Rabbit	28	17	27	62	13
Elk	41	41	27	41	25
Deer	32	31	39	35	20
Cattle	18	16	23	15	11

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
45 (111)	29 (58)	42 (104)	21 (53)
17 (42)	46 (92)	32 (78)	13 (31)
33 (82)	41 (101)	23 (56)	8 (20)

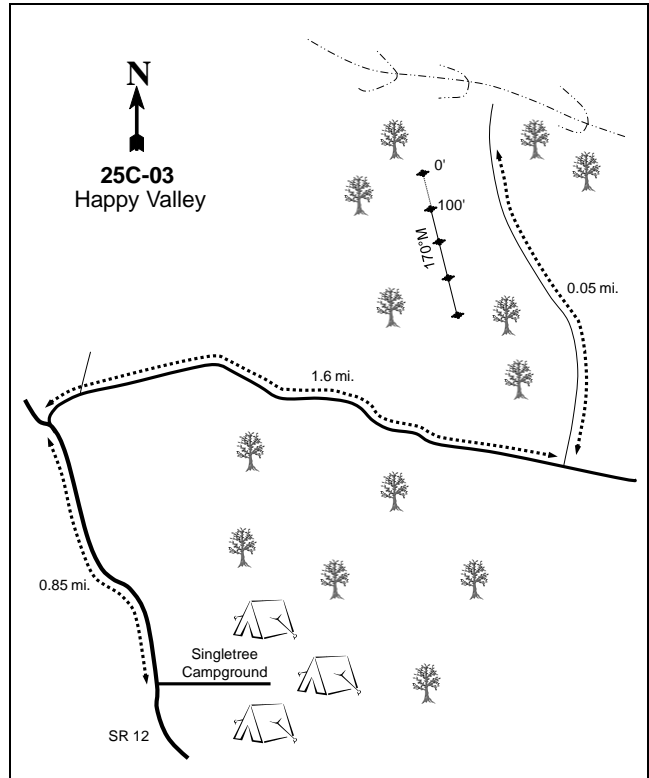
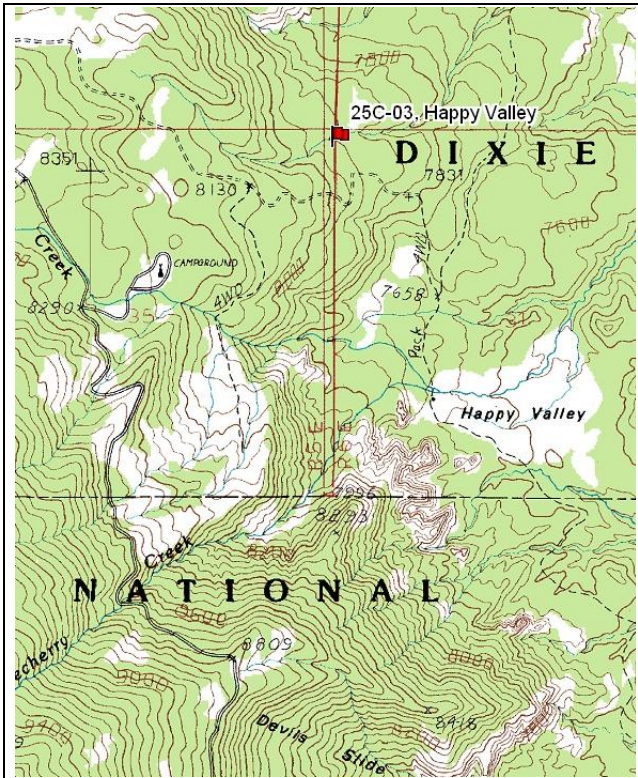
BROWSE CHARACTERISTICS--

Management unit 25C, Study no: 2

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
94	0	0	0	-	-	0	0	0	25/37
98	0	0	0	-	-	0	0	0	40/52
03	0	0	0	-	-	0	0	0	36/41
08	0	0	0	-	-	0	0	0	59/61
13	0	0	0	-	-	0	0	0	46/65
<b>Artemisia nova</b>									
94	0	0	0	0	-	0	0	0	-/-
98	940	28	55	17	140	47	2	2	14/21
03	880	0	89	11	-	34	2	2	14/22
08	820	17	54	29	40	27	0	20	12/25
13	700	6	94	0	60	14	0	0	12/23
<b>Artemisia tridentata wyomingensis</b>									
94	5320	11	64	25	40	40	4	16	15/24
98	2640	12	70	17	100	31	5	5	22/30
03	2860	3	75	22	-	21	3	8	24/33
08	4360	20	51	29	100	27	12	12	23/34
13	3960	33	61	6	420	34	12	7	23/38
<b>Chrysothamnus depressus</b>									
94	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	60	0	100	-	-	33	33	0	4/5
13	20	0	100	-	-	0	100	0	3/8
<b>Chrysothamnus nauseosus</b>									
94	0	0	0	-	-	0	0	0	-/-
98	20	0	100	-	-	100	0	0	-/-
03	20	0	100	-	-	0	100	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus viscidiflorus stenophyllus</b>										
94	80	25	75	-	-	75	0	0	-/-	
98	0	0	0	-	-	0	0	0	8/22	
03	80	0	100	-	-	0	0	0	8/8	
08	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	5/7	
<b>Eriogonum microthecum</b>										
94	500	4	96	-	-	0	84	0	3/5	
98	240	25	75	-	-	25	0	0	4/7	
03	220	0	100	-	-	18	73	0	4/6	
08	140	0	100	-	-	0	0	0	4/4	
13	160	25	75	-	-	0	13	0	4/5	
<b>Gutierrezia sarothrae</b>										
94	280	14	79	7	-	0	0	0	5/4	
98	120	0	100	0	40	17	0	0	10/8	
03	340	0	94	6	-	0	0	0	7/7	
08	280	0	100	0	-	0	0	0	8/8	
13	200	10	90	0	-	0	0	0	8/16	
<b>Leptodactylon pungens</b>										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Opuntia sp.</b>										
94	40	50	50	-	-	0	0	0	3/11	
98	0	0	0	-	40	0	0	0	-/-	
03	400	0	100	-	-	0	0	5	2/4	
08	320	25	75	-	120	0	0	6	3/9	
13	1320	26	74	-	-	0	0	2	3/6	
<b>Tetradymia canescens</b>										
94	800	33	58	10	20	28	33	13	4/5	
98	820	34	56	10	60	41	32	2	5/8	
03	880	16	77	7	-	23	18	2	7/8	
08	1240	29	68	3	100	5	0	2	5/6	
13	460	30	70	0	20	22	43	17	5/7	

HAPPY VALLEY - TREND STUDY NO. 25C-3



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Grover; Township 30S, Range 5E, Section 36  
NAD 83, UTM Zone 12, 471802 East 4224454 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

7066  
170° magnetic  
400ft  
Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Belt 2: 1ft, Belt 5: 1ft

**Directions to Site**

From the entrance to Singletree Campground on SR 12, drive 0.85 miles north to the turnoff to Happy Valley. Turn east and go 1.6 miles staying on the main road until a minor fork. Turn left onto a faint two-track road and go 0.05 miles to a ponderosa pine and a rebar witness stake located 15 feet off the left side of the road. The baseline starts 75 feet west of the witness post and then runs south. The 0-foot baseline stake is marked with browse tag #7066.

**Site Information**

Land Ownership USFS  
 Allotment Pleasant Creek  
 Elevation 7,920ft (2,414m)  
 Aspect East  
 Slope 15-34%  
 Sample Dates 09/02/1985, 08/26/1991, 07/15/1994, 07/21/1998, 08/28/2003, 08/21/2008, 08/15/2013

**DISTURBANCE HISTORY--**

Management unit 25C, Study no: 3

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Fire	-	-	June 1984	-
Seeding	-	-	1984	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter, Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 25C, Study no: 3

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>
1985-2013	Ponderosa Pine/Bitterbrush

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

A wildfire prior to site establishment in 1985 likely killed many of the small to medium sized ponderosa pine (*Pinus ponderosa*) trees, but many of the larger trees survived the fire. The U.S. Forest Service within the surrounding area, following the fire, planted ponderosa pine seedlings. A guzzler pipe transverses line 3 and runs east.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Ponderosa Pine)  
 NRCS Ecological Site # R047XB433UT

**SOIL ANALYSIS DATA--**

Management unit 25C, Study no: 3

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Clay Loam	56.0	21.4	22.6	6.5	0.7	3.3	21.4	153.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Prior to site establishment in 1985, the study was likely occupied by a mix, moderately dense stand of ponderosa pine and Utah juniper (*Juniperus osteosperma*) trees. Following the wildfire, the ponderosa pine population decreased significantly in cover and density leaving antelope bitterbrush (*Purshia tridentata*) as the dominant browse species. Since 1994, ponderosa pine has increased in cover and density, and is considered to be co-dominant species on the site. Perennial grasses and forbs have been diverse and common over the duration of the study (Table - Browse Trends, Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25C, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	6.2	14.4	1.0	22.7	0.0	10.0	0.0	<b>54.2</b>	Fair
1998	7.5	15.0	4.0	30.0	-0.2	10.0	0.0	<b>66.3</b>	Fair-Good
2003	13.6	13.0	2.1	24.7	0.0	8.3	0.0	<b>61.7</b>	Fair
2008	13.1	13.4	3.8	23.8	0.0	4.9	0.0	<b>59.0</b>	Fair
2013	14.4	14.6	9.1	25.9	0.0	6.2	0.0	<b>70.3</b>	Good

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 3

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	Agropyron cristatum	a5	a15	a13	ab27	b42	.21	.42	.19	.30	.64
G	Agropyron intermedium	6	6	10	5	2	.04	.03	.02	.01	.00
G	Bouteloua gracilis	a68	ab113	bc136	c172	c170	2.81	4.43	5.85	6.31	5.96
G	Bromus inermis	-	-	-	5	-	-	-	-	.38	-
G	Bromus tectorum (a)	1	17	1	-	-	.00	.33	.01	-	-
G	Carex sp.	72	76	71	68	54	.96	1.41	.83	.68	.38
G	Oryzopsis hymenoides	ab30	b47	a19	ab24	ab20	2.22	1.81	.22	.39	.46
G	Poa fendleriana	a103	bc162	c172	ab114	abc132	2.85	5.18	4.18	2.73	2.68
G	Sitanion hystrix	a64	b114	a59	ab87	a53	.57	2.12	.42	.83	.83
G	Sporobolus cryptandrus	b31	ab21	b36	a4	b24	.77	.42	.58	.15	.53
G	Stipa comata	b38	ab18	a9	a9	b30	.87	.55	.05	.09	1.47
Total for Annual Grasses		1	17	1	0	0	0.00	0.33	0.01	0	0
Total for Perennial Grasses		417	572	525	515	527	11.33	16.39	12.37	11.91	12.97
Total for Grasses		418	589	526	515	527	11.33	16.72	12.38	11.91	12.97
F	Allium sp.	a1	ab10	ab14	ab6	b19	.00	.10	.05	.04	.08
F	Alyssum alyssoides (a)	-	-	2	-	-	-	-	.03	-	-
F	Antennaria parvifolia	3	3	4	5	4	.15	.04	.06	.18	.06
F	Arabis demissa	-	3	-	-	-	-	.00	-	-	-
F	Artemesia carruthii	a122	b163	a116	ab120	a112	3.82	4.50	2.05	1.42	1.62
F	Artemesia dracunculul	-	-	1	-	5	-	-	.00	-	.03
F	Aster chilensis	-	-	-	3	-	-	-	-	.03	-
F	Astragalus sp.	9	-	1	5	-	.09	-	.03	.01	-
F	Chenopodium album (a)	5	-	10	-	-	.01	-	.04	-	-
F	Cirsium sp.	-	3	-	-	-	-	.00	-	-	-
F	Cryptantha sp.	6	-	2	1	1	.02	-	.00	.00	.00
F	Cymopterus sp.	-	2	-	-	-	-	.03	-	-	-
F	Descurainia pinnata (a)	-	5	2	-	-	-	.04	.01	-	-
F	Erigeron divergens	-	-	-	3	-	-	-	-	.03	-
F	Erigeron eatonii	6	6	1	7	1	.01	.04	.00	.05	.00
F	Erigeron flagellaris	-	-	5	-	-	-	-	.15	-	-

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
F	<i>Erigeron pumilus</i>	3	9	2	-	3	.00	.01	.03	-	.01
F	<i>Eriogonum alatum</i>	3	7	1	-	2	.03	.03	.00	-	.00
F	<i>Eriogonum cernuum</i> (a)	2	-	-	3	-	.00	-	-	.00	-
F	<i>Eriogonum racemosum</i>	ab <sup>64</sup>	b <sup>90</sup>	ab <sup>77</sup>	a <sup>43</sup>	ab <sup>71</sup>	.35	1.52	.68	.20	.57
F	<i>Eriogonum umbellatum</i>	-	-	-	2	-	-	-	-	.03	-
F	<i>Gilia</i> sp. (a)	-	3	-	-	-	-	.03	-	-	-
F	<i>Hedysarum boreale</i>	3	5	1	1	5	.06	.33	.03	.03	.31
F	<i>Hymenoxys acaulis</i>	-	1	-	-	-	-	.03	-	-	-
F	<i>Hymenoxys richardsonii</i>	18	9	11	7	16	.67	.25	.27	.21	.13
F	<i>Lappula occidentalis</i> (a)	a <sup>7</sup>	b <sup>19</sup>	ab <sup>10</sup>	a <sup>-</sup>	a <sup>-</sup>	.01	.04	.07	-	-
F	<i>Lepidium</i> sp. (a)	a <sup>-</sup>	b <sup>14</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>2</sup>	-	.03	-	-	.00
F	<i>Linum kingii</i>	-	-	-	2	-	-	-	-	.00	-
F	<i>Lithospermum ruderales</i>	-	-	1	-	2	-	-	.00	-	.03
F	<i>Lotus utahensis</i>	-	2	-	-	5	-	.00	-	-	.00
F	<i>Lupinus argenteus</i>	ab <sup>7</sup>	ab <sup>2</sup>	a <sup>-</sup>	b <sup>11</sup>	a <sup>-</sup>	.04	.03	-	.07	-
F	<i>Lygodesmia spinosa</i>	ab <sup>10</sup>	ab <sup>6</sup>	b <sup>18</sup>	a <sup>2</sup>	a <sup>3</sup>	.48	.16	.66	.03	.00
F	<i>Machaeranthera grindelioides</i>	-	2	-	-	-	-	.15	-	-	-
F	<i>Penstemon comarrhenus</i>	a <sup>-</sup>	a <sup>-</sup>	ab <sup>2</sup>	b <sup>10</sup>	ab <sup>2</sup>	-	-	.01	.05	.03
F	<i>Phlox longifolia</i>	-	3	2	-	-	-	.00	.00	-	-
F	<i>Polygonum douglasii</i> (a)	-	3	1	-	4	-	.01	.00	-	.01
F	<i>Potentilla gracilis</i>	ab <sup>5</sup>	ab <sup>2</sup>	b <sup>11</sup>	a <sup>-</sup>	b <sup>16</sup>	.01	.03	.05	-	.08
F	<i>Sphaeralcea coccinea</i>	8	16	4	3	3	.02	.29	.04	.03	.09
F	<i>Tragopogon dubius</i> (a)	-	1	-	-	-	-	.00	-	-	-
Total for Annual Forbs		14	45	25	3	6	0.03	0.17	0.16	0.00	0.01
Total for Perennial Forbs		268	344	274	231	270	5.80	7.59	4.17	2.44	3.10
Total for Forbs		282	389	299	234	276	5.83	7.76	4.33	2.45	3.12

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 3

Type	Species	Quadrat Cover %					Line Intercept Cover%		
		'94	'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia nova</i>	.03	.00	.18	.16	.44	.21	.26	.68
B	<i>Artemisia tridentata vaseyana</i>	-	.15	-	-	-	-	-	-
B	<i>Cercocarpus montanus</i>	-	.03	-	-	-	-	-	-
B	<i>Chrysothamnus depressus</i>	-	.34	.06	.03	-	-	-	-
B	<i>Chrysothamnus nauseosus</i>	.73	.82	2.72	1.91	.78	2.33	2.28	.46
B	<i>Chrysothamnus parryi</i>	.15	.21	.24	-	.09	.05	.03	.10
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	1.57	1.44	.64	.21	.03	.36	.45	.11
B	<i>Gutierrezia sarothrae</i>	1.87	1.45	.70	.63	1.62	1.85	1.28	2.95
B	<i>Opuntia</i> sp.	.00	.03	-	-	-	-	-	-
B	<i>Pediocactus simpsonii</i>	-	-	.00	.03	-	-	.06	-



Type	Species	Quadrat Cover %					Line Intercept Cover%		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Pinus edulis	.01	-	-	-	-	-	-	-
B	Pinus ponderosa	1.48	3.84	3.73	2.52	3.64	13.48	17.31	19.23
B	Purshia tridentata	4.10	4.51	8.85	8.52	9.10	7.20	9.28	10.33
B	Ribes sp.	-	.03	-	-	.15	-	-	-
B	Sambucus racemosa	-	.03	-	.03	-	.25	.15	-
B	Tetradymia canescens	.15	.33	.38	-	.06	.06	.06	.01
B	Yucca harrimaniae	2.90	2.58	3.66	2.91	3.34	3.20	3.03	3.20
Total for Browse		13.01	15.82	21.19	16.98	19.28	28.99	34.19	37.07

POINT-QUARTER TREE DATA--  
Management unit 25C, Study no: 3

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osterosperma	20	<18	<18	22	1.4	-	-	2.3
Pinus ponderosa	140	140	141	155	4.7	5.8	9.6	7.4
Pseudotsuga menziesii	<18	<18	<18	20	-	-	-	4.1
Pinus edulis	<18	<18	<18	20	-	-	-	1.8

BASIC COVER--  
Management unit 25C, Study no: 3

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	25.82	39.38	35.17	36.28	42.03
Rock	23.07	30.29	26.31	28.25	22.58
Pavement	1.36	8.41	5.92	5.53	2.56
Litter	30.79	39.39	39.93	34.53	38.95
Cryptogams	0	.29	0	0	.03
Bare Ground	13.10	15.55	8.84	7.16	8.89

PELLET GROUP DATA--  
Management unit 25C, Study no: 3

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	4	4	9	36	1	-	-	-	-
Elk	2	4	1	4	-	1 (2)	5 (12)	4 (10)	3 (7)
Deer	14	16	37	32	10	11 (27)	61 (150)	34 (83)	9 (23)
Cattle	-	4	6	6	-	15 (37)	14 (34)	11 (27)	10 (25)

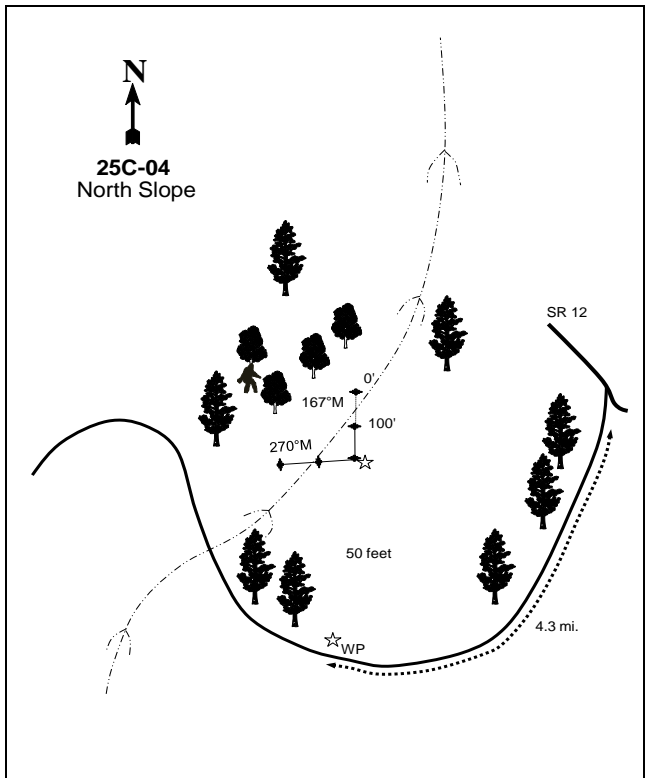
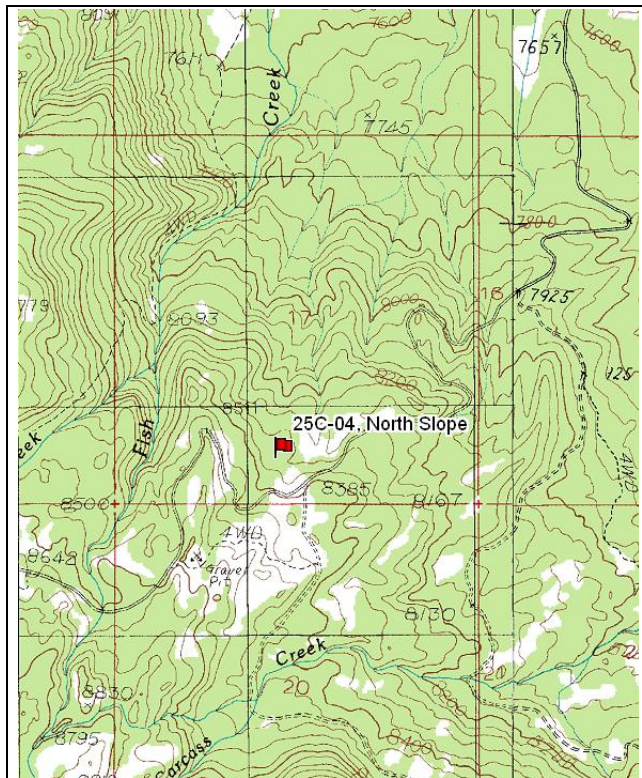
BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 3

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia nova</i>										
94	80	0	100	0	-	0	0	0	11/18	
98	60	0	100	0	-	0	0	0	15/22	
03	160	13	88	0	-	0	0	0	8/25	
08	240	33	50	17	80	58	8	8	7/17	
13	240	50	42	8	240	8	0	8	10/30	
<i>Artemisia tridentata vaseyana</i>										
94	0	0	0	-	-	0	0	0	8/8	
98	0	0	0	-	-	0	0	0	11/9	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Cercocarpus montanus</i>										
94	0	0	0	-	-	0	0	0	12/15	
98	20	0	100	-	-	100	0	0	13/24	
03	0	0	0	-	-	0	0	0	10/17	
08	0	0	0	-	-	0	0	0	9/22	
13	0	0	0	-	-	0	0	0	34/33	
<i>Chrysothamnus depressus</i>										
94	0	0	0	0	-	0	0	0	-/-	
98	140	14	86	0	-	57	0	0	7/14	
03	100	0	100	0	-	40	60	0	2/7	
08	80	25	25	50	40	25	50	25	2/6	
13	20	0	100	0	-	0	0	100	-/-	
<i>Chrysothamnus nauseosus</i>										
94	860	5	93	2	20	0	0	0	16/17	
98	600	7	90	3	-	0	0	3	29/31	
03	300	0	67	33	-	13	7	0	25/25	
08	400	5	75	20	40	15	0	10	34/30	
13	140	14	14	71	-	29	0	57	33/35	
<i>Chrysothamnus parryi</i>										
94	180	0	100	0	-	44	44	0	4/11	
98	220	18	82	0	-	0	0	0	9/15	
03	440	5	68	27	-	68	14	0	8/11	
08	420	19	76	5	-	14	14	19	7/7	
13	180	33	67	0	-	11	0	0	11/12	

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>Chrysothamnus viscidiflorus stenophyllus</i>									
94	<b>940</b>	2	94	4	-	13	0	0	12/27
98	<b>760</b>	0	97	3	-	0	0	0	15/18
03	<b>800</b>	15	80	5	20	38	18	0	12/17
08	<b>400</b>	0	15	85	-	10	80	65	15/18
13	<b>120</b>	50	50	0	-	33	0	0	12/14
<i>Gutierrezia sarothrae</i>									
94	<b>7280</b>	27	69	4	460	0	0	1	6/6
98	<b>3700</b>	6	94	0	440	0	0	0	9/8
03	<b>3340</b>	6	93	1	-	0	0	0	7/7
08	<b>2720</b>	19	76	4	180	0	0	4	7/7
13	<b>2740</b>	7	91	1	-	.72	0	1	8/10
<i>Opuntia sp.</i>									
94	<b>320</b>	6	94	-	-	0	0	0	2/7
98	<b>20</b>	0	100	-	-	0	0	0	2/4
03	<b>20</b>	0	100	-	-	0	0	0	2/7
08	<b>0</b>	0	0	-	-	0	0	0	2/5
13	<b>0</b>	0	0	-	-	0	0	0	2/4
<i>Pediocactus simpsonii</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	0	100	-	-	0	0	0	2/2
08	<b>20</b>	0	100	-	-	0	0	0	2/4
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Pinus ponderosa</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>200</b>	90	10	-	40	0	0	0	-/-
03	<b>200</b>	70	30	-	-	0	0	0	-/-
08	<b>200</b>	30	70	-	-	0	0	0	-/-
13	<b>220</b>	45	55	-	-	0	0	27	-/-
<i>Purshia tridentata</i>									
94	<b>940</b>	2	96	2	-	32	11	2	14/41
98	<b>760</b>	8	92	0	40	45	37	0	17/49
03	<b>1100</b>	4	89	7	-	20	80	2	17/47
08	<b>1520</b>	7	88	5	20	51	30	1	14/38
13	<b>1900</b>	17	82	1	120	26	61	1	14/46
<i>Quercus gambelii</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	40/75
03	<b>0</b>	0	0	-	-	0	0	0	27/15
08	<b>0</b>	0	0	-	-	0	0	0	28/22
13	<b>0</b>	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Ribes</i> sp.										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Sambucus racemosa</i>										
94	140	0	100	-	-	0	0	0	23/22	
98	20	0	100	-	-	0	0	0	25/32	
03	40	50	50	-	-	0	50	0	20/30	
08	40	50	50	-	-	0	50	0	19/24	
13	20	0	100	-	-	0	0	0	13/18	
<i>Tetradymia canescens</i>										
94	120	17	83	0	-	33	0	0	7/13	
98	200	10	90	0	20	30	0	0	9/14	
03	260	15	69	15	-	38	38	8	7/11	
08	80	0	50	50	-	0	50	0	5/7	
13	200	50	50	0	-	30	0	0	9/15	
<i>Yucca harrimaniae</i>										
94	1580	3	97	0	-	0	0	0	13/22	
98	1520	16	82	3	-	0	0	1	14/23	
03	1400	44	54	1	-	0	0	1	14/20	
08	1860	23	71	6	-	0	0	1	10/16	
13	1700	34	66	0	300	0	0	0	13/19	

NORTH SLOPE - TREND STUDY NO. 25C-4



**Location Information**

USGS 7.5 min Map Info      Blind Lake; Township 30S, Range 5E, Section 17  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 466142 East 4227918 North

**Transect Information**

Browse Tag # (0' Stake)      7077  
 Transect Bearing              167° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (95ft), Line 4 (59ft)  
 Belt Marker Placement        Belt 2: 3ft, Belt 5: 1ft

**Directions to Site**

From Grover, Utah, go 1.5 miles northwest on SR 12 to the North Slope Road. Turn up this road staying left on the main road and continue for 4.3 miles. Stop before you get to a bend in the road near the head of a draw. Look for a witness post at the base of a Ponderosa Pine 10 feet below the road. The witness post is a 2.5 foot steel rebar tagged #7181. The 200-foot stake is a full-high post 50 feet from the witness post. The 0-foot baseline stake is marked by browse tag #7077.

### Site Information

Land Ownership USFS  
 Allotment North Slope C&H  
 Elevation 8,330ft (2,539m)  
 Aspect North  
 Slope 10-15%  
 Sample Dates 09/02/1985, 08/27/1991, 07/22/1998, 08/28/2003, 08/21/2008, 08/12/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer

#### VEGETATION HISTORY--

Management unit 25C, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
*1998	Bitterbrush	Phase I
2003-2013	Bitterbrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

\*Site was moved in 1998

### Site Notes

In 1998, The site was moved to better sample the area of interest. The new baseline is located entirely within a more open area where the key browse and herbaceous communities are more representative.

### Site Potential

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Ponderosa Pine)  
 NRCS Ecological Site # R047XB433UT

#### SOIL ANALYSIS DATA--

Management unit 25C, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	64.0	19.4	16.6	5.9	0.5	2.8	12.0	137.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

#### States and Transitions

No state and transition model is available for the above ecological site.

Since the reestablishment of the site in 1998, the population of antelope bitterbrush (*Purshia tridentata*) has generally decreased in cover, but has maintained a stable density. The tree community has also maintained stable populations (Table - Browse Trends, Table - Point-Quarter Tree Data). Additionally, since 1998, the perennial grass and forb communities have maintained stable, diverse populations (Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25C, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	24.2	14.1	6.9	30.0	0.0	10.0	0.0	<b>85.2</b>	Excellent
2003	26.0	11.2	1.9	26.4	0.0	7.9	0.0	<b>73.3</b>	Good
2008	17.2	5.2	6.5	30.0	0.0	7.4	0.0	<b>66.3</b>	Fair-Good
2013	16.9	12.6	7.4	30.0	0.0	7.5	0.0	<b>74.3</b>	Good

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 4

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron spicatum	b16	a-	ab3	ab2	.35	-	.01	.03
G	Bouteloua gracilis	a229	a231	b259	b280	8.07	6.58	11.87	11.52
G	Bromus anomalus	-	-	-	5	-	-	-	.03
G	Carex sp.	ab53	a35	b99	b66	1.17	.41	2.61	1.05
G	Oryzopsis hymenoides	-	1	3	1	-	.00	.03	.00
G	Poa fendleriana	c223	bc199	a93	b158	11.08	5.26	2.78	5.97
G	Sitanion hystrix	c111	b58	a29	ab42	2.24	.53	.50	.73
G	Stipa columbiana	-	-	-	3	-	-	-	.03
G	Stipa comata	24	20	46	22	.41	.40	1.26	.52
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		656	544	532	579	23.33	13.20	19.08	19.90
Total for Grasses		656	544	532	579	23.33	13.20	19.08	19.90
F	Allium sp.	1	-	-	-	.00	-	-	-
F	Alyssum alyssoides (a)	a-	b16	a-	a-	-	.23	-	-
F	Androsace septentrionalis (a)	c100	b27	a-	ab3	.93	.08	-	.15
F	Antennaria parvifolia	35	28	38	41	1.69	.20	1.08	.70
F	Arabis demissa	10	5	6	12	.07	.04	.01	.04
F	Artemesia carruthii	b126	a56	a74	a56	3.14	.86	.63	1.33
F	Artemisia dracunculus	c25	b10	a-	b15	.91	.14	-	.34
F	Astragalus sp.	-	-	9	-	-	-	.09	-
F	Chaenactis douglasii	6	-	-	-	.01	-	-	-
F	Chenopodium album (a)	a-	b57	a-	a-	-	.28	-	-
F	Chenopodium leptophyllum(a)	a-	b46	a-	ab2	-	.16	-	.00
F	Cirsium sp.	2	-	1	-	.00	-	.15	-
F	Cryptantha sp.	-	-	3	3	-	-	.03	.00
F	Descurainia pinnata (a)	b8	ab3	a-	a-	.02	.03	-	-
F	Draba sp. (a)	-	1	-	-	-	.00	-	-
F	Erigeron eatonii	17	4	11	14	.34	.06	.04	.07
F	Erigeron flagellaris	11	10	4	9	.25	.06	.07	.09
F	Erigeron pumilus	10	12	13	8	.24	.15	.18	.07

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Eriogonum alatum	-	-	-	3	-	.00	-	.06
F	Eriogonum racemosum	32	27	23	25	.30	.22	.08	.16
F	Eriogonum sp.	2	-	-	-	.03	-	-	-
F	Gayophytum ramosissimum(a)	-	6	-	-	-	.01	-	-
F	Gilia sp. (a)	2	-	-	-	.01	-	-	-
F	Holosteum umbellatum (a)	-	3	-	-	-	.00	-	-
F	Hymenoxys richardsonii	3	1	2	-	.03	.03	.00	-
F	Lappula occidentalis (a)	b9	b9	a-	a-	.02	.07	-	-
F	Lepidium sp. (a)	b33	ab8	a-	a-	.11	.02	-	-
F	Lupinus argenteus	c85	b50	b36	a4	5.08	1.26	.63	.04
F	Lychnis drummondii	-	-	1	-	-	-	.03	-
F	Lygodesmia spinosa	17	6	7	11	.44	.25	.22	.31
F	Penstemon comarrhenus	ab8	a3	b20	b20	.18	.03	.10	.07
F	Petradoria pumila	1	5	4	5	.15	.15	.15	.03
F	Polygonum douglasii (a)	5	-	-	-	.01	-	-	-
F	Potentilla gracilis	a14	a6	a1	b35	.12	.05	.03	.32
F	Potentilla hippiana	a-	ab1	b15	a-	-	.03	.12	-
F	Pteridium aquilinum	-	-	-	1	-	-	-	.00
F	Sphaeralcea coccinea	11	7	5	7	.07	.21	.04	.06
F	Taraxacum officinale	1	-	-	-	.00	-	-	-
F	Tragopogon dubius (a)	4	-	-	-	.01	-	-	-
F	Unknown forb-perennial	ab1	b7	a-	a-	.00	.15	-	-
Total for Annual Forbs		161	176	0	5	1.12	0.91	0	0.15
Total for Perennial Forbs		418	238	273	269	13.11	3.94	3.71	3.73
Total for Forbs		579	414	273	274	14.24	4.85	3.71	3.89

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 4

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	1.84	1.52	.98	3.00	1.80	1.78	2.26
B	Artemisia tridentata vaseyana	.30	.33	.89	.33	.18	.05	.35
B	Chrysothamnus depressus	.19	-	-	.06	-	-	.15
B	Chrysothamnus parryi	.81	.82	.45	.09	.75	.45	.10
B	Chrysothamnus viscidiflorus lanceolatus	7.83	8.01	2.47	4.06	6.03	3.35	4.40
B	Gutierrezia sarothrae	.80	.36	.48	.05	.40	.55	-
B	Juniperus scopulorum	1.48	1.48	1.03	1.39	2.11	2.65	2.75
B	Pediocactus simpsonii	.09	.06	.03	.03	-	-	-
B	Pinus edulis	.78	1.75	2.08	1.18	1.93	2.13	2.88
B	Pinus ponderosa	.00	-	-	-	-	1.10	-
B	Potentilla fruticosa	-	.00	-	-	-	-	-



Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Purshia tridentata	14.16	15.80	9.93	8.42	17.85	19.03	11.76
B	Tetradymia canescens	.15	.03	.03	.06	.05	.03	.20
B	Yucca sp.	-	-	-	.15	-	-	-
Total for Browse		28.47	30.18	18.39	18.85	31.1	31.12	24.85

POINT-QUARTER TREE DATA--

Management unit 25C, Study no: 4

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma/ scopulorum	10	30	31	30	4.6	6.6	7.5	8.6
Pinus edulis	17	42	44	46	4.4	4.2	5.2	4.9
Pinus ponderosa	8	<18	25	23	15.1	-	9.3	4.9

BASIC COVER--

Management unit 25C, Study no: 4

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	54.93	45.06	46.80	45.92
Rock	14.31	17.25	15.19	12.03
Pavement	8.15	7.00	10.06	5.62
Litter	49.14	39.53	29.68	39.96
Cryptogams	4.07	.19	.36	1.35
Bare Ground	9.62	10.79	12.03	12.46

PELLET GROUP DATA--

Management unit 25C, Study no: 4

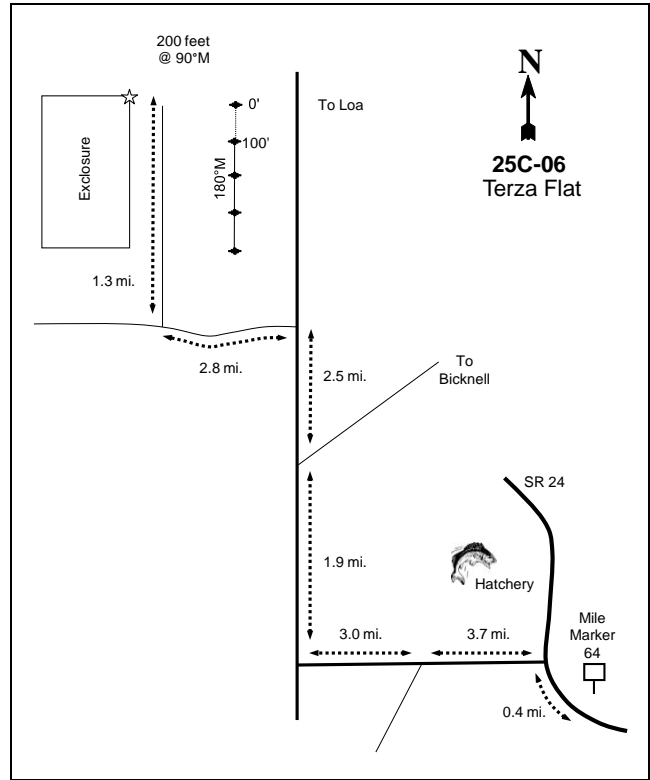
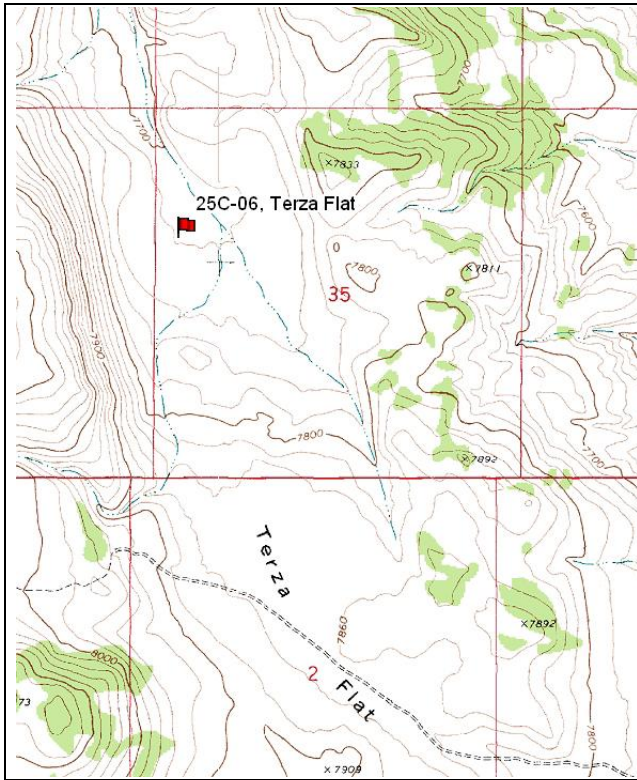
Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	25	24	63	11	-	-	-	-
Horse	-	-	-	1	-	-	-	-
Elk	4	4	7	1	3 (7)	1 (2)	3 (8)	-
Deer	30	37	29	26	50 (124)	66 (164)	45 (111)	22 (55)
Cattle	12	5	6	13	36 (89)	15 (36)	2 (4)	17 (43)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 4

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia nova</i>										
98	1000	50	48	2	40	2	0	2	12/19	
03	820	0	76	24	-	17	0	20	10/14	
08	1720	45	47	8	240	34	3	1	8/18	
13	1420	35	62	3	600	14	1	6	12/20	
<i>Artemisia tridentata vaseyana</i>										
98	220	27	73	0	-	0	0	0	19/27	
03	300	7	93	0	-	47	7	0	22/25	
08	540	33	56	11	20	63	0	7	13/21	
13	140	57	43	0	-	86	0	29	20/25	
<i>Chrysothamnus depressus</i>										
98	260	0	92	8	-	0	0	0	8/11	
03	0	0	0	0	-	0	0	0	-/-	
08	0	0	0	0	-	0	0	0	-/-	
13	100	0	100	0	-	0	0	0	7/9	
<i>Chrysothamnus parryi</i>										
98	940	6	77	17	-	0	0	0	10/10	
03	820	10	90	0	-	49	7	0	8/10	
08	480	13	83	4	-	4	0	0	7/8	
13	180	0	89	11	-	11	0	11	8/11	
<i>Chrysothamnus viscidiflorus lanceolatus</i>										
98	4060	7	81	11	-	2	0	.98	18/20	
03	4300	7	81	11	40	7	0	.46	16/20	
08	2820	1	33	66	-	21	9	46	14/18	
13	2620	5	75	21	-	35	16	25	15/21	
<i>Gutierrezia sarothrae</i>										
98	1400	4	90	6	-	0	0	3	9/11	
03	900	16	84	0	-	0	0	0	7/6	
08	1480	8	89	3	40	14	0	3	6/8	
13	720	28	72	0	-	0	0	0	7/9	
<i>Juniperus scopulorum</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	20	100	0	-	-	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	-/-	
<i>Pediocactus simpsonii</i>										
98	80	0	100	-	20	0	0	0	1/4	
03	80	0	100	-	-	0	0	0	1/4	
08	100	0	100	-	-	0	0	0	2/3	
13	100	0	100	-	-	0	0	0	2/4	

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>Pinus edulis</i>									
98	<b>40</b>	50	50	-	20	0	0	0	-/-
03	<b>20</b>	100	0	-	20	0	0	0	-/-
08	<b>40</b>	50	50	-	-	0	0	0	-/-
13	<b>60</b>	67	33	-	-	0	0	0	-/-
<i>Potentilla fruticosa</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	20	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	6/6
<i>Purshia tridentata</i>									
98	<b>2000</b>	9	88	3	120	77	1	0	21/45
03	<b>1540</b>	4	84	12	-	31	62	0	25/52
08	<b>1580</b>	8	56	37	20	47	16	6	19/40
13	<b>1740</b>	6	84	10	160	45	34	22	22/43
<i>Sclerocactus sp.</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	4/9
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Tetradymia canescens</i>									
98	<b>80</b>	0	75	25	-	0	0	0	12/15
03	<b>120</b>	0	67	33	-	0	17	17	8/12
08	<b>160</b>	13	38	50	-	0	0	50	9/15
13	<b>100</b>	20	80	0	-	60	0	0	12/16

TERZA FLAT - TREND STUDY NO. 25C-6



**Location Information**

USGS 7.5 min Map Info Moroni Peak; Township 28S, Range 2E, Section 35  
 GPS (0' Stake) NAD 83, UTM Zone 12, 441498 East 4243112 North

**Transect Information**

Browse Tag # (0' Stake) 7178  
 Transect Bearing 180° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement Standard

**Directions to Site**

South of Bicknell, turn on the road (east) towards Bicknell Fish Hactery. This road is 0.4 miles north of mile marker 64. Travel east for 3.7 miles to a fork, stay right at the fork (sign says left is toward King’s Ranch). Continue 3.0 miles to an intersection. Turn right (north) and go 1.9 miles to a fork, stay left (straight) for another 2.5 miles to a road going left (west). Drive 2.8 miles to a road going left (north). Take this road for 1.3 miles to an enclosure. Drive to the northeast corner of the enclosure. The 0-foot end of the baseline is 200 feet east of the corner in line with the fence. The 0-foot stake is a fencepost marked by browse tag #7178. The other stakes are marked by rebar.

**Site Information**

Land Ownership BLM  
 Allotment Loa Winter  
 Elevation 7,710ft (2,350m)  
 Aspect Northeast  
 Slope 3%  
 Sample Dates 09/15/1985, 08/27/1991, 07/21/1994, 07/22/1998, 08/21/2003, 08/20/2008, 08/12/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Crucial Winter; Sage-Grouse, Habitat Not Winter

VEGETATION HISTORY--

Management unit 25C, Study no: 6

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Low Rabbitbrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

There appears to have been some sort of disturbance, prior to site establishment in 1985. Pronghorn can be found in the area year-round. Due to the difficulty in distinguishing between pronghorn and deer pellet groups, pellet groups for these species have been combined.

**Site Potential**

1981-2010 Average Annual Precipitation 11 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

SOIL ANALYSIS DATA--

Management unit 25C, Study no: 6

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	50.0	25.4	24.6	7.2	0.6	1.4	7.7	128.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since the establishment of the site in 1985, narrowleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *stenophyllus*) has maintained a stable population over the duration of the study. A diverse number of introduced weedy annual forb species have persisted over the same period. The invasive forb species Halogeton (*Halogeton glomeratus*) has maintained a dominant presence within the understory, but has had some variance in average cover since 1994 (Table - Browse Trends, Table - Herbaceous Trends). This site will likely need rehabilitation to improve the sparse herbaceous understory.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25C, study no: 6

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	2.5	0.0	0.0	0.9	0.0	0.0	0.0	<b>3.4</b>	Very Poor
1998	5.3	12.4	6.9	0.8	0.0	0.0	0.0	<b>25.3</b>	Poor-Fair
2003	3.3	0.0	0.0	0.0	0.0	0.0	0.0	<b>3.3</b>	Very Poor
2008	3.4	0.4	0.0	0.0	0.0	0.0	0.0	<b>3.8</b>	Very Poor
2013	2.8	0.0	0.0	0.1	0.0	0.0	0.0	<b>2.9</b>	Very Poor

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 6

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	Oryzopsis hymenoides	-	2	-	-	-	-	.00	-	-	-
G	Sitanion hystrix	<sub>b</sub> 44	<sub>b</sub> 38	<sub>a</sub> -	<sub>a</sub> -	<sub>ab</sub> 3	.44	.39	-	.00	.03
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	
Total for Perennial Grasses		44	40	0	0	3	0.44	0.39	0	0.00	0.03
Total for Grasses		44	40	0	0	3	0.44	0.39	0	0.00	0.03
F	Astragalus sp.	4	-	-	4	-	.01	-	-	.01	-
F	Chenopodium fremontii (a)	8	-	9	-	-	.02	-	.09	-	-
F	Chenopodium leptophyllum(a)	-	-	2	-	-	-	-	.01	-	-
F	Descurainia sp. (a)	-	1	-	-	-	-	.01	-	-	-
F	Draba sp. (a)	4	-	-	-	-	.01	-	-	-	-
F	Eriogonum cernuum (a)	-	-	-	-	-	-	-	.00	-	-
F	Halogeton glomeratus (a)	<sub>ab</sub> 118	<sub>a</sub> 89	<sub>b</sub> 139	<sub>b</sub> 152	<sub>a</sub> 100	2.83	1.65	7.03	9.55	3.07
F	Lappula occidentalis (a)	-	7	-	-	-	-	.01	-	-	-
F	Polygonum douglasii (a)	5	-	-	-	-	.00	-	-	-	-
F	Ranunculus testiculatus (a)	-	-	-	5	-	-	-	-	.00	-
F	Salsola iberica (a)	<sub>c</sub> 67	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 26	1.02	-	-	-	.22
F	Sphaeralcea grossulariifolia	-	-	-	-	1	-	-	-	-	.00
Total for Annual Forbs		202	97	150	157	126	3.89	1.68	7.14	9.55	3.30
Total for Perennial Forbs		4	0	0	4	1	0.00	0	0	0.01	0.00
Total for Forbs		206	97	150	161	127	3.90	1.68	7.14	9.57	3.30

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

BROWSE TRENDS--

Management unit 25C, Study no: 6

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Artemisia frigida	.56	.78	.06	.06	-	-	.06	.11
B	Artemisia nova	.36	.96	.03	.15	.00	.03	-	-
B	Artemisia tridentata wyomingensis	1.05	2.27	2.37	2.41	2.18	2.61	3.66	4.73
B	Ceratoides lanata	.15	.37	.22	.09	.09	.28	.11	-
B	Chrysothamnus viscidiflorus stenophyllus	7.21	10.93	6.34	5.80	8.46	8.75	11.36	13.98
B	Gutierrezia sarothrae	.23	.09	.33	.42	.06	.23	.21	-
Total for Browse		9.57	15.42	9.36	8.95	10.81	11.9	15.4	18.82

BASIC COVER--

Management unit 25C, Study no: 6

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	13.80	17.43	16.77	19.13	13.82
Rock	6.61	6.39	9.92	6.07	5.42
Pavement	25.41	30.49	34.85	53.68	33.15
Litter	16.29	12.10	6.94	13.36	6.45
Cryptogams	.01	.20	.04	.21	.06
Bare Ground	33.95	43.60	38.86	23.03	45.48

PELLET GROUP DATA--

Management unit 25C, Study no: 6

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	74	64	39	85	10	-	-	-	-
Elk	4	6	-	2	-	9 (22)	1 (2)	-	-
Deer/ Pronghorn	20	51	6	21	3	56 (138)	11 (26)	24 (60)	11 (28)
Cattle	-	1	-	1	-	3 (7)	1 (2)	-	1 (2)

BROWSE CHARACTERISTICS--

Management unit 25C, Study no: 6

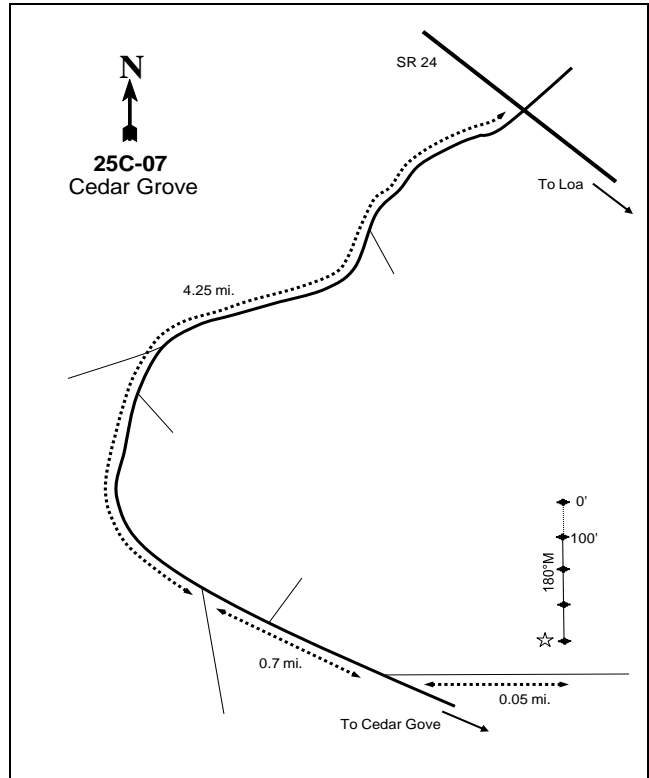
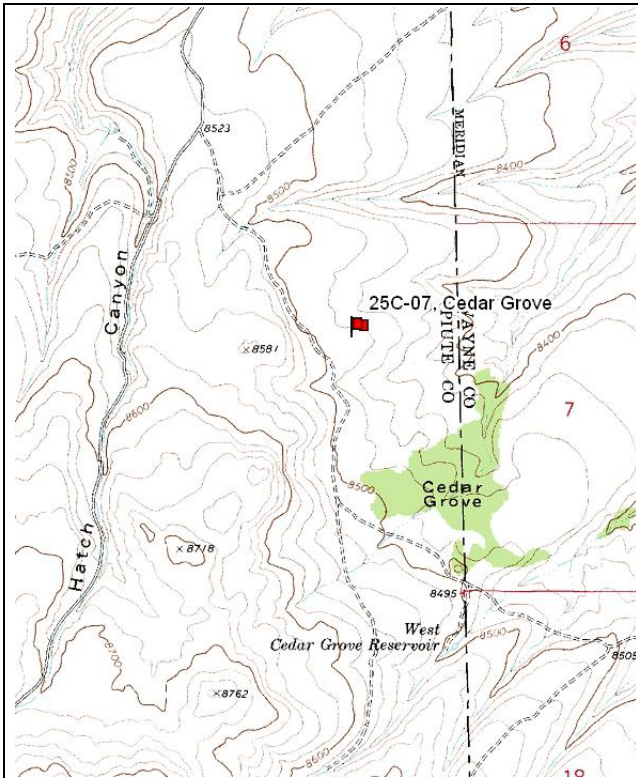
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Artemisia frigida									
94	<b>4260</b>	4	70	26	-	0	0	18	2/4
98	<b>1320</b>	23	76	2	4240	20	5	0	4/6
03	<b>140</b>	0	100	0	-	0	14	0	4/5
08	<b>700</b>	11	86	3	20	40	23	0	3/6
13	<b>60</b>	0	100	0	-	0	0	0	3/8

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 nova</i>									
94	460	0	100	0	-	0	0	0	12/21
98	360	11	83	6	-	39	0	0	11/18
03	60	0	33	67	-	33	0	0	15/24
08	20	0	100	0	-	0	0	0	10/24
13	140	14	86	0	-	57	29	0	15/24
<i>Artemisia tridentata wyomingensis</i>									
94	440	0	100	0	-	9	0	0	11/20
98	520	12	73	15	-	19	4	0	17/29
03	640	3	66	31	-	9	3	19	21/36
08	720	8	72	19	40	19	47	8	17/28
13	680	21	74	6	-	32	15	0	16/30
<i>Atriplex canescens</i>									
94	200	0	100	-	-	10	40	0	6/6
98	80	100	0	-	-	25	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	100	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Ceratoides lanata</i>									
94	1120	0	77	23	-	36	0	9	4/5
98	1380	12	87	1	60	48	20	1	3/5
03	460	0	96	4	-	0	91	4	6/8
08	440	14	73	14	60	9	86	0	3/5
13	140	0	100	0	-	0	100	0	2/4
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
94	11140	13	80	7	660	0	0	3	6/14
98	10920	26	61	13	720	.73	0	3	8/14
03	9200	3	90	8	-	0	1	4	8/13
08	11360	8	77	15	20	39	18	5	7/14
13	9660	34	66	0	1840	.82	0	.20	8/15
<i>Gutierrezia sarothrae</i>									
94	1300	2	82	17	40	0	0	8	5/6
98	120	0	100	0	580	0	0	0	5/6
03	720	0	100	0	-	0	0	0	6/9
08	720	0	100	0	-	0	0	0	5/7
13	140	0	100	0	60	0	0	0	5/6
<i>Opuntia sp.</i>									
94	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	6/12
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	5/10
13	0	0	0	-	-	0	0	0	-/-



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Rosa woodsii										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	6/16	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	

CEDAR GROVE - TREND STUDY NO. 25C-7



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Abes Knoll; Township 28S, Range 1W, Section 12  
NAD 83, UTM Zone 12, 425461 East 4249782 North

**Transect Information**

Browse Tag # (0' Stake)	*7178
Transect Bearing	180° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)
Belt Marker Placement	Standard

**Directions to Site**

Head northwest out of Loa on SR 24 for about 11 miles to the summit (marked by a sign, "elevation 8410 ft"). Turn left on a gravel road (Cedar Grove Road) and go 4.25 miles to a fork (West Cedar Grove Road). Turn left and continue 0.75 miles to a faint road to the left. Turn onto this road and go down 0.05 miles (about 55 paces) to a rebar 50 feet to the north of the road. This rebar is tagged #7179 and marks the 400-foot stake. The other stakes are marked by short (1-foot) rebar. The 0-foot baseline stake is 390 feet true north of the 400-foot stake. \*The 100-foot stake has a red browse tag #7178 attached.

**Site Information**

Land Ownership SITLA  
 Allotment Not Applicable  
 Elevation 8,480ft (2,585m)  
 Aspect Southeast  
 Slope 5-7%  
 Sample Dates 09/14/1985, 06/17/1991, 08/19/1998, 08/25/2003, 08/20/2008, 08/08/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Crucial Year-Long; Sage-Grouse, Habitat Not Winter, Nesting and Brood-Rearing

VEGETATION HISTORY--

Management unit 25C, Study no: 7

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Mountain Big Sagebrush/Black Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Pronghorn may be present in the area year-round. Due to the similarities of pronghorn and deer pellet groups, the two species' pellet groups have been combined. Elk pellet groups were common in 1998 and 2003, but infrequent to absent the following years. Thermal and escape cover for wildlife is minimal in the area, but can be found in a small stand of Utah juniper (*Juniperus osteosperma*) a third of a mile away from the study area. Cattle were present on the site in 1985 and 1991.

**Site Potential**

1981-2010 Average Annual Precipitation 21 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Shallow Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R047XB322UT

SOIL ANALYSIS DATA--

Management unit 25C, Study no: 7

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	48.0	29.4	22.6	6.1	0.4	2.4	16.9	195.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since the establishment of the site in 1985, the site has maintained a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and black sagebrush (*Artemisia nova*) (Table - Browse Trends). Additionally, the understory has maintained a diverse compilation of perennial grasses and forbs. The perennial grass species mutton bluegrass (*Poa fendleriana*) has maintained dominance within the understory since 1991 (Table - Herbaceous Trends, Appendix - Pre-1992).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25C, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	18.9	6.1	2.0	20.0	0.0	3.0	0.0	<b>50.0</b>	Poor-Fair
2003	26.8	2.6	0.2	17.7	0.0	1.9	0.0	<b>49.1</b>	Poor-Fair
2008	20.7	-0.6	2.1	19.7	0.0	2.4	0.0	<b>44.2</b>	Poor
2013	20.6	8.9	5.4	22.0	0.0	2.9	0.0	<b>59.7</b>	Fair

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 7

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron smithii	1	2	2	4	.03	.00	.01	.04
G	Agropyron spicatum	a5	a4	b26	a9	.05	.18	.72	.39
G	Bouteloua gracilis	14	17	15	23	.28	.52	.40	.32
G	Carex sp.	a33	a12	b53	b61	.18	.01	.29	.52
G	Poa fendleriana	252	244	233	231	9.03	7.77	7.84	9.21
G	Sitanion hystrix	51	40	26	24	.44	.32	.34	.42
G	Stipa lettermani	a-	ab3	b17	ab12	-	.04	.22	.09
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		356	322	372	364	10.02	8.85	9.83	10.99
Total for Grasses		356	322	372	364	10.02	8.85	9.83	10.99
F	Androsace septentrionalis (a)	b63	a21	a20	a23	.39	.07	.08	.05
F	Antennaria sp.	2	1	5	4	.00	.00	.00	.03
F	Arabis demissa	b11	a-	b10	b8	.03	-	.03	.02
F	Astragalus convallarius	-	1	4	-	-	.03	.04	-
F	Astragalus sp.	15	3	12	6	.09	.00	.06	.03
F	Calochortus nuttallii	-	2	-	-	-	.00	-	-
F	Chaenactis douglasii	3	-	-	-	.00	-	-	-
F	Collinsia parviflora (a)	-	-	-	4	-	-	-	.01
F	Cruciferae	-	7	-	-	-	.01	-	-
F	Cryptantha sp.	ab4	a-	b16	b10	.01	-	.11	.08
F	Cymopterus sp.	1	-	-	2	.00	-	-	.00
F	Descurainia pinnata (a)	-	3	-	-	-	.00	-	-
F	Erigeron eatonii	b33	a1	a13	a5	.14	.00	.04	.01
F	Erigeron pumilus	b30	a9	a11	a8	.25	.01	.05	.10
F	Holosteum umbellatum (a)	-	2	-	-	-	.00	-	-
F	Hymenoxys richardsonii	-	-	-	1	-	-	-	.00
F	Lappula occidentalis (a)	-	3	-	-	-	.00	-	-
F	Lomatium triternatum	a-	b9	ab1	a-	-	.02	.00	-
F	Lotus utahensis	1	-	4	5	.00	-	.03	.01
F	Lygodesmia spinosa	20	21	14	19	.36	.50	.40	.61

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Machaeranthera grindelioides</i>	-	-	2	5	-	-	.00	.01
F	<i>Microsteris gracilis</i> (a)	-	3	-	-	-	.03	-	-
F	<i>Phlox austromontana</i>	21	15	32	21	.42	.23	.22	.45
F	<i>Phlox longifolia</i>	<sub>b</sub> 55	<sub>a</sub> 20	<sub>b</sub> 43	<sub>ab</sub> 26	.16	.08	.14	.05
F	<i>Polygonum douglasii</i> (a)	1	-	-	-	.00	-	-	-
F	<i>Senecio multilobatus</i>	3	-	3	3	.01	-	.00	.00
F	<i>Trifolium</i> sp.	<sub>a</sub> -	<sub>a</sub> 3	<sub>b</sub> 7	<sub>ab</sub> 1	.00	.01	.05	.00
Total for Annual Forbs		64	32	20	27	0.39	0.12	0.08	0.06
Total for Perennial Forbs		199	92	177	124	1.50	0.93	1.21	1.45
Total for Forbs		263	124	197	151	1.90	1.05	1.29	1.51

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 7

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia nova</i>	7.40	11.75	7.88	9.53	13.20	13.36	12.78
B	<i>Artemisia tridentata vaseyana</i>	7.71	9.66	8.63	6.92	7.36	9.93	9.03
B	<i>Chrysothamnus viscidiflorus stenophyllus</i>	-	.07	.00	-	-	.08	-
B	<i>Eriogonum microthecum</i>	.01	.01	.01	.03	.01	.01	-
B	<i>Gutierrezia sarothrae</i>	.04	.00	.18	-	-	.03	-
B	<i>Pediocactus simpsonii</i>	-	.00	.03	.03	-	-	-
B	<i>Opuntia</i> sp.	-	-	-	-	-	-	.01
Total for Browse		15.17	21.50	16.75	16.52	20.57	23.41	21.82

#### BASIC COVER--

Management unit 25C, Study no: 7

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	32.63	28.45	26.41	30.66
Rock	9.01	12.55	9.96	9.46
Pavement	24.20	23.00	32.46	23.77
Litter	27.92	21.27	22.72	21.52
Cryptogams	.39	.93	.67	.87
Bare Ground	16.36	22.84	25.36	22.01

PELLET GROUP DATA--

Management unit 25C, Study no: 7

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	31	58	74	22	-	-	-	-
Elk	9	11	2	-	25 (62)	25 (61)	6 (15)	-
Deer/ Pronhorn	7	8-	6	7	2 (5)	8 (20)	13 (33)	3 (7)
Cattle	-	1	3	2	4 (10)	8 (20)	2 (5)	4 (11)

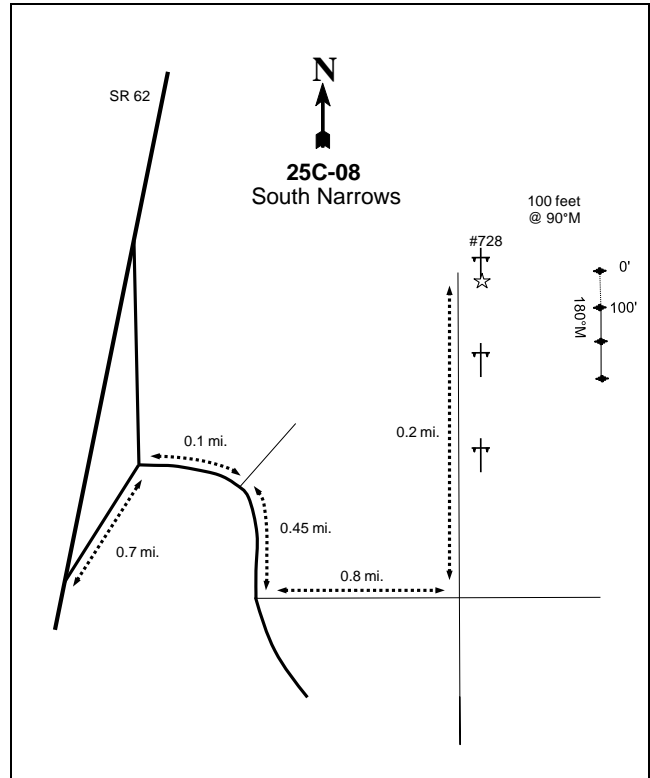
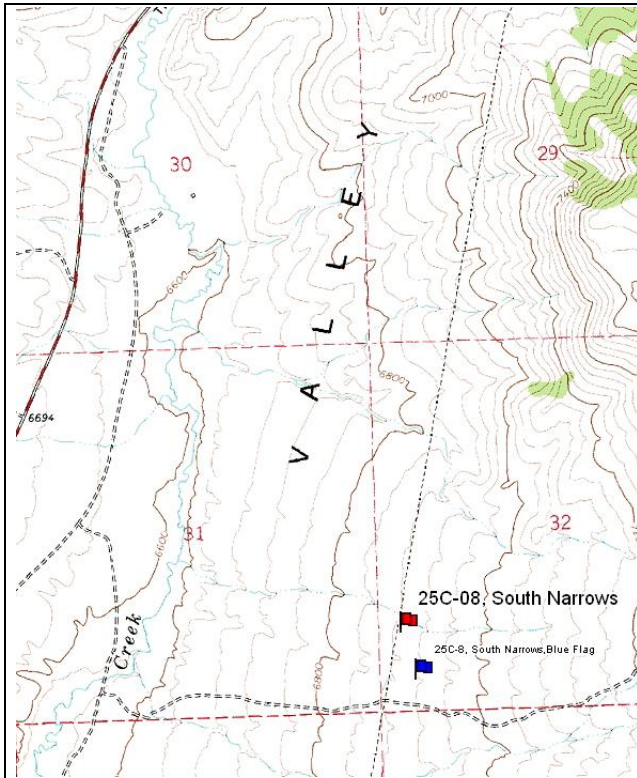
BROWSE CHARACTERISTICS--

Management unit 25C, Study no: 7

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia frigida</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>80</b>	0	100	-	-	0	0	0	-/-
<i>Artemisia nova</i>									
98	<b>4120</b>	6	79	16	80	12	12	5	12/22
03	<b>4000</b>	0	69	32	-	6	.50	18	12/23
08	<b>4440</b>	0	50	49	1460	14	25	30	10/23
13	<b>3680</b>	12	73	15	140	21	0	16	11/24
<i>Artemisia tridentata vaseyana</i>									
98	<b>2440</b>	2	56	43	40	37	20	15	17/26
03	<b>2780</b>	1	45	53	-	13	4	27	20/30
08	<b>2600</b>	8	38	55	1180	30	52	39	18/31
13	<b>2320</b>	9	62	28	-	46	8	24	21/33
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
98	<b>60</b>	0	100	0	-	0	0	0	8/9
03	<b>440</b>	18	82	0	20	0	0	0	6/5
08	<b>60</b>	0	67	33	-	0	67	0	7/8
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Eriogonum microthecum</i>									
98	<b>260</b>	15	85	0	-	0	0	0	6/8
03	<b>280</b>	0	100	0	-	50	36	0	5/6
08	<b>240</b>	0	83	17	20	25	58	17	5/6
13	<b>140</b>	43	57	0	-	14	0	0	5/6
<i>Gutierrezia sarothrae</i>									
98	<b>220</b>	0	100	-	-	0	0	0	9/8
03	<b>240</b>	25	75	-	-	0	0	0	4/5
08	<b>540</b>	0	100	-	40	7	15	0	6/6
13	<b>20</b>	0	100	-	-	0	0	0	7/9

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Leptodactylon pungens</b>										
98	0	0	0	0	-	0	0	0	-/-	
03	20	0	100	0	-	0	0	0	6/4	
08	20	0	0	100	-	0	0	0	8/14	
13	0	0	0	0	-	0	0	0	-/-	
<b>Opuntia sp.</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	20	0	100	-	-	0	0	0	3/4	
13	20	100	0	-	-	0	0	0	2/5	
<b>Pediocactus simpsonii</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	60	0	100	-	-	0	0	0	1/1	
08	40	50	50	-	-	0	0	0	2/2	
13	40	0	100	-	-	0	0	0	1/3	
<b>Purshia tridentata</b>										
98	0	0	0	-	-	0	0	0	30/89	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Symphoricarpos oreophilus</b>										
98	0	0	0	-	-	0	0	0	19/49	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	10/28	
<b>Tetradymia canescens</b>										
98	20	0	100	-	-	100	0	0	4/5	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	

SOUTH NARROWS - TREND STUDY NO. 25C-8



**Location Information**

USGS 7.5 min Map Info Parker Knoll; Township 28S, Range 1W, Section 32  
 GPS (0' Stake) NAD 83, UTM Zone 12, 418168 East 4242552North

**Transect Information**

Browse Tag # (0' Stake) 7120  
 Transect Bearing 180° magnetic  
 Length 300ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft & 95ft), Line 3 (59ft)  
 Belt Marker Placement Belt 4: 2ft

**Directions to Site**

Proceed south of Koosharem on SR 62. Turn left (east) at mile marker 24. Go northeast 0.7 miles and turn right. Go east 0.1 miles to another fork and turn right. Go 0.45 miles and turn left just across the creek (Otter Creek). Go 0.8 miles east and turn left. Drive parallel to the powerline (north) for 0.2 miles to pole #728. The frequency baseline begins 100 feet east of this powerpole. The 0-foot baseline stake is tagged #7120. All stakes are rebar.



**Site Information**

Land Ownership SITLA  
 Allotment South Narrows  
 Elevation 6,900ft (2,103m)  
 Aspect Southwest  
 Slope 4%  
 Sample Dates 09/16/1985, 07/11/1991, 07/27/1994, 08/07/1998, 08/27/2003, 08/14/2008, 06/24/2009, 08/05/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Pronghorn, Crucial Year-Long; Sage-Grouse, Habitat Not Winter

VEGETATION HISTORY--

Management unit 25C, Study no: 8

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Water for wildlife can be found a half mile away at Otter Creek. Deer pellet groups were very abundant in 2008, and a deer carcass was found south of the site in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 9 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R047XB222UT

SOIL ANALYSIS DATA--

Management unit 25C, Study no: 8

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	54.0	31.4	14.6	6.3	0.5	1.5	13.5	105.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since the establishment of the site in 1985, Wyoming big sagebrush (*Atrémisia tridentata* ssp. *wyomingensis*) has remained the dominant browse species, while blue grama (*Bouteloua gracilis*) has been the dominant perennial grass species. Utah juniper (*Juniperus osteosperma*) has maintained a sparse population (Table - Browse Trends, Table - Herbaceous Trends). The invasive annual grass species cheatgrass (*Bromus tectorum*) has been observed on the site since 1994. Additionally, fire could alter the community by causing both broomsnakeweed (*Gutierrezia sarothrae*) and cheatgrass to increase in cover and frequency, increasing their likelihood of becoming dominant on the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25C, study no: 8

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	13.9	4.5	2.0	30.0	0.0	0.2	0.0	<b>50.7</b>	Good
1998	12.5	5.4	7.0	27.1	0.0	0.2	0.0	<b>52.2</b>	Good
2003	17.7	-1.8	0.5	27.1	0.0	0.0	0.0	<b>43.5</b>	Fair-Good
2008	13.1	-4.8	1.0	30.0	0.0	0.0	0.0	<b>39.3</b>	Fair
2013	15.4	5.7	1.0	30.0	0.0	0.2	0.0	<b>52.3</b>	Good

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 8

Type	Species	Nested Frequency						Average Cover %					
		'94	'98	'03	'08	'09	'13	'94	'98	'03	'08	'09	'13
G	<i>Bouteloua gracilis</i>	b351	ab328	ab312	a294	ab317	a285	12.30	9.30	10.01	10.74	11.03	9.18
G	<i>Bromus tectorum</i> (a)	ab1	b14	a-	a-	a-	a-	.00	.06	-	-	-	-
G	<i>Oryzopsis hymenoides</i>	bc52	ab27	a8	a12	a15	c86	1.80	.36	.21	.32	.54	2.87
G	<i>Phleum pratense</i>	-	-	-	-	-	5	-	-	-	-	-	.15
G	<i>Sitanion hystrix</i>	b61	b63	a22	a20	a18	a12	.88	.36	.12	.25	.10	.06
G	<i>Sporobolus cryptandrus</i>	b8	ab3	ab1	a-	a-	a-	.10	.03	.03	-	-	-
G	<i>Stipa comata</i>	a114	b185	b178	b217	b225	b171	2.96	3.48	3.16	6.58	5.47	7.40
Total for Annual Grasses		1	14	0	0	0	0	0.00	0.06	0	0	0	0
Total for Perennial Grasses		586	606	521	543	575	559	18.05	13.55	13.54	17.90	17.15	19.67
Total for Grasses		587	620	521	543	575	559	18.05	13.61	13.54	17.90	17.15	19.67
F	<i>Alyssum alyssoides</i> (a)	-	-	-	-	1	-	-	-	-	-	.00	-
F	<i>Astragalus</i> sp.	6	3	-	-	-	-	.04	.04	-	-	-	-
F	<i>Chenopodium album</i> (a)	-	-	-	-	1	-	-	-	-	-	.00	-
F	<i>Descurainia pinnata</i> (a)	b20	ab2	b17	a-	a-	a-	.05	.00	.15	-	-	-
F	<i>Draba</i> sp. (a)	b12	ab9	a-	a-	a-	a-	.03	.01	-	-	-	-
F	<i>Erigeron pumilus</i>	ab10	ab9	a-	ab1	ab2	b23	.07	.06	-	.00	.00	.10
F	<i>Eriogonum</i> sp.	-	-	-	-	2	-	-	-	-	-	.00	-
F	<i>Lappula occidentalis</i> (a)	c65	ab3	b28	a-	ab6	a-	.15	.01	.18	-	.02	-
F	<i>Lepidium</i> sp. (a)	b21	a-	a-	a-	a-	a-	.05	-	-	-	-	-
F	<i>Phlox hoodii</i>	-	-	1	-	-	-	-	-	.00	-	-	-
F	<i>Phlox longifolia</i>	3	-	-	-	-	-	.00	-	-	-	-	-
F	<i>Sphaeralcea coccinea</i>	-	-	3	-	2	-	-	-	.00	-	.00	-
Total for Annual Forbs		118	14	45	0	8	0	0.28	0.03	0.33	0	0.03	0
Total for Perennial Forbs		19	12	4	1	6	23	0.12	0.10	0.00	0.00	0.01	0.10
Total for Forbs		137	26	49	1	14	23	0.40	0.13	0.34	0.00	0.04	0.10

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

BROWSE TRENDS--

Management unit 25C, Study no: 8

Type	Species	Quadrat Cover %						Line Intercept Cover%			
		'94	'98	'03	'08	'09	'13	'03	'08	'09	'13
B	Artemisia tridentata wyomingensis	11.14	10.00	14.18	10.44	16.02	12.33	12.88	15.83	13.38	16.90
B	Chrysothamnus nauseosus	-	-	-	.03	-	-	-	.05	-	-
B	Chrysothamnus viscidiflorus	-	-	-	-	-	.03	-	-	-	.01
B	Echinocereus sp.	.00	-	-	-	-	-	-	-	-	-
B	Gutierrezia sarothrae	-	-	.03	-	-	-	-	-	-	-
B	Juniperus osteosperma	.15	.03	-	-	-	-	-	-	-	-
B	Opuntia sp.	.00	.00	.36	.24	.19	.33	.01	.05	.03	.01
B	Pediocactus simpsonii	-	.07	.01	-	-	-	-	-	-	.03
B	Tetradymia canescens	-	-	-	-	.00	-	-	-	.06	-
Total for Browse		11.30	10.10	14.58	10.71	16.21	12.70	12.89	15.93	13.47	16.95

BASIC COVER--

Management unit 25C, Study no: 8

Cover Type	Average Cover %					
	'94	'98	'03	'08	'09	'13
Vegetation	27.00	27.67	28.39	32.65	28.66	34.50
Rock	25.76	25.91	25.40	24.92	23.82	22.74
Pavement	3.57	15.20	15.48	17.00	11.90	13.77
Litter	17.28	26.57	20.56	30.34	23.00	24.38
Cryptogams	.33	.92	.51	.53	.42	.11
Bare Ground	16.27	20.51	17.73	6.91	15.42	11.22

PELLET GROUP DATA--

Management unit 25C, Study no: 8

Type	Quadrat Frequency					
	'94	'98	'03	'08	'09	'13
Rabbit	17	18	23	56	27	12
Elk	7	11	5	4	5	-
Deer	24	37	23	42	28	18
Cattle	3	1	2	4	1	1

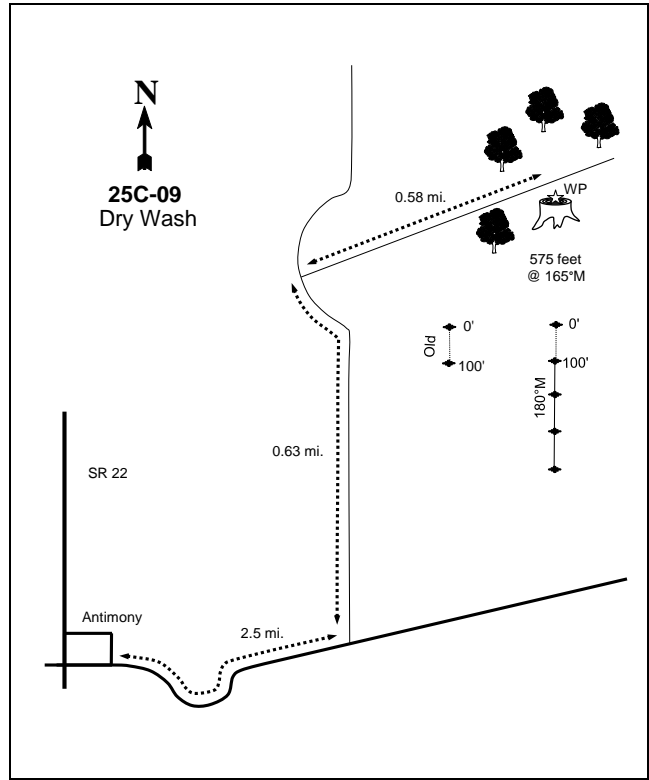
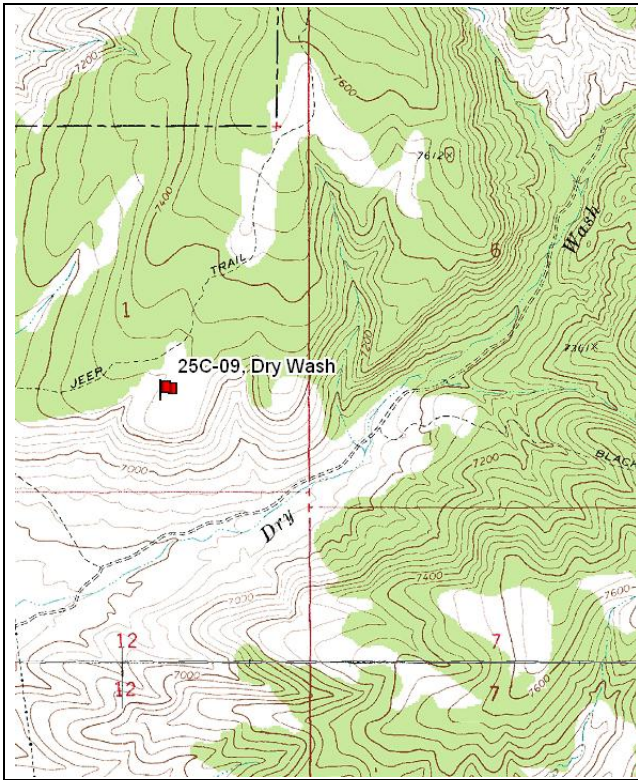
Days use per acre (ha)				
'98	'03	'08	'09	'13
-	-	-	-	-
16 (40)	17 (41)	17 (43)	-	2 (5)
30 (74)	29 (73)	70 (174)	-	15 (36)
3 (7)	9 (23)	9 (22)	-	4 (11)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 8

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
94	<b>4340</b>	4	61	35	40	34	2	17	17/29	
98	<b>3900</b>	14	54	32	20	38	10	14	18/30	
03	<b>4440</b>	1	43	56	-	17	0	31	18/29	
08	<b>3980</b>	2	32	66	-	45	22	65	16/28	
09	<b>0</b>	0	0	0	-	0	0	0	17/32	
13	<b>3720</b>	2	67	31	300	58	28	29	19/33	
<i>Ceratoides lanata</i>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>20</b>	0	100	-	-	0	0	0	9/6	
03	<b>20</b>	0	100	-	-	0	0	0	6/10	
08	<b>20</b>	0	100	-	-	0	0	0	7/7	
09	<b>0</b>	0	0	-	-	0	0	0	5/6	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus nauseosus</i>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>20</b>	0	100	-	-	100	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>20</b>	0	100	-	-	0	0	0	6/11	
09	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus viscidiflorus</i>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
09	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	-	0	0	0	6/11	
<i>Gutierrezia sarothrae</i>										
94	<b>0</b>	0	0	0	-	0	0	0	-/-	
98	<b>0</b>	0	0	0	-	0	0	0	7/11	
03	<b>20</b>	0	0	100	-	0	0	0	-/-	
08	<b>0</b>	0	0	0	-	0	0	0	-/-	
09	<b>0</b>	0	0	0	-	0	0	0	-/-	
13	<b>0</b>	0	0	0	-	0	0	0	-/-	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Juniperus osteosperma</b>									
94	0	0	0	-	-	0	0	0	-/-
98	20	0	100	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Opuntia sp.</b>									
94	60	0	100	0	20	0	0	0	2/3
98	100	40	60	0	-	0	0	0	4/6
03	260	0	100	0	-	0	0	8	4/10
08	140	29	57	14	20	14	0	14	3/10
09	0	0	0	0	-	0	0	0	3/9
13	140	14	71	14	-	14	0	29	3/8
<b>Pediocactus simpsonii</b>									
94	0	0	0	-	-	0	0	0	-/-
98	140	29	71	-	20	0	0	0	1/2
03	40	0	100	-	-	0	0	0	2/3
08	0	0	0	-	-	0	0	0	2/3
09	0	0	0	-	-	0	0	0	1/2
13	20	0	100	-	-	0	0	0	1/4
<b>Pinus edulis</b>									
94	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	20	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Tetradymia canescens</b>									
94	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
09	0	0	0	-	-	0	0	0	4/10
13	0	0	0	-	-	0	0	0	-/-

DRY WASH - TREND STUDY NO. 25C-9



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Angle; Township 31S, Range 2W, Section 01  
NAD 83, UTM Zone 12, 416120 East 4221253 North

**Transect Information**

Browse Tag # (0' Stake) 7177  
Transect Bearing 180° magnetic  
Length 400ft  
Belt Placement Line 1 (95ft), Line 2 (11ft & 71ft), Line 3 (34ft), Line 4 (59ft)  
Belt Marker Placement Standard

**Directions to Site**

From the town of Antimony, go east on the dump road (off Main between the Antimony school and Antimony mercantile) 2.5 miles up Dry Wash Canyon then turn left. Go up the hill 0.63 miles to the top of the ridge and turn right. Go 0.58 miles to a small stump on the right side with tagged rebar #7176. The baseline stake is 575 feet away at 165 degrees magnetic. The 0-foot baseline stake is tagged #7177. Due to rocks, the 100-foot end of the baseline is marked by a rebar that is 101 feet away.

**Site Information**

Land Ownership BLM  
 Allotment Dry Wash  
 Elevation 7,300ft (2,225m)  
 Aspect North  
 Slope 10%  
 Sample Dates 09/16/1985, 08/20/1991, 07/27/1994, 08/06/1998, 08/01/2003, 08/06/2008, 07/16/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter; Sage-Grouse, Not Winter Habitat

VEGETATION HISTORY--

Management unit 25C, Study no: 9

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-1998	Wyoming Big Sagebrush	Phase I
2003-2013	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

In 1994, the old baseline was abandoned as the transect and the new baseline was incorporated into the density plot transect 100 feet to the east. Additionally, both transects were read in 1994, but only the new transect’s data was reported. Elk and deer pellet groups have been abundant since 1998 (Table - Pellet Group Data). It has been noted that the site has had a history of heavy grazing pressures.

**Site Potential**

1981-2010 Average Annual Precipitation 9 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Aridic Argiborolls  
 NRCS Ecological Site [Upland Stony Loam \(Mountain Big Sagebrush\)/Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB336UT/R047XB308UT

SOIL ANALYSIS DATA--

Management unit 25C, Study no: 9

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	48.0	29.4	22.6	7.2	0.5	3.5	9.7	179.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1985, the site was comprised mainly of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and a moderately diverse community of perennial grasses within the understory (Table - Browse Trends, Table - Herbaceous Trends). There was also scattered pinyon pine (*Pinus edulis*) trees. Over the duration of the study, cover of pinyon pine has increased while densities have remained similar from year to year (Table - Browse Trends), which likely suggests that encroachment of pinyon has progressed since 1994. The invasive annual grass cheatgrass (*Bromus tectorum*) has likely been found on the site since establishment, but cheatgrass presence was first recorded in 1994. Cheatgrass has varied widely in frequency and cover since 1994. It is predicted that pinyon pine will likely continue to increase on the site, and without disturbance, is expected to become dominant on the study site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25C, study no: 9

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	15.8	12.0	9.6	12.2	0.0	0.2	0.0	<b>49.7</b>	Good
1998	13.6	12.7	12.0	13.4	-0.9	0.2	0.0	<b>51.0</b>	Good
2003	15.4	5.0	2.8	10.4	-2.9	0.1	0.0	<b>30.7</b>	Fair
2008	10.4	1.5	0.8	13.7	-0.1	0.0	0.0	<b>26.4</b>	Poor-Fair
2013	11.3	10.1	2.4	16.4	0.0	0.0	0.0	<b>40.1</b>	Fair

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 9

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	<i>Bouteloua gracilis</i>	bc113	a61	abc102	ab84	c129	3.13	2.19	2.37	2.34	3.94
G	<i>Bromus tectorum</i> (a)	ab19	c181	c167	b39	a3	.06	1.20	3.86	.08	.03
G	<i>Oryzopsis hymenoides</i>	b117	b111	a49	a41	a44	1.21	1.03	.74	.95	.52
G	<i>Sitanion hystrix</i>	bc81	c103	a34	b59	bc77	.85	1.06	.31	.75	1.40
G	<i>Sporobolus cryptandrus</i>	ab3	ab5	a-	b40	ab3	.03	.18	-	1.22	.03
G	<i>Stipa comata</i>	84	108	120	122	99	.85	2.24	1.75	1.60	2.30
Total for Annual Grasses		19	181	167	39	3	0.06	1.20	3.86	0.08	0.03
Total for Perennial Grasses		398	388	305	346	352	6.08	6.72	5.19	6.87	8.20
Total for Grasses		417	569	472	385	355	6.15	7.92	9.05	6.95	8.23
F	<i>Arabis demissa</i>	-	-	-	-	2	-	-	-	-	.00
F	<i>Astragalus purshii</i>	3	5	-	-	3	.03	.01	-	-	.00
F	<i>Castilleja</i> sp.	-	1	-	-	-	-	.00	-	-	-
F	<i>Chenopodium album</i> (a)	b24	a-	a-	ab1	ab3	.08	-	-	.00	.00
F	<i>Cryptantha</i> sp.	4	5	-	-	-	.01	.02	-	-	-
F	<i>Descurainia pinnata</i> (a)	b88	a-	b95	a-	a-	.17	-	.60	-	-
F	<i>Erigeron pumilus</i>	b14	b18	ab1	a-	ab2	.05	.06	.03	-	.00
F	<i>Lappula occidentalis</i> (a)	c68	b15	c63	a-	a-	.11	.03	.30	-	-
F	<i>Salsola iberica</i> (a)	-	-	-	-	6	-	-	-	-	.01
Total for Annual Forbs		180	15	158	1	9	0.36	0.03	0.90	0.00	0.01
Total for Perennial Forbs		21	29	1	0	7	0.09	0.10	0.03	0	0.01
Total for Forbs		201	44	159	1	16	0.45	0.13	0.93	0.00	0.03

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



BROWSE TRENDS--

Management unit 25C, Study no: 9

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	8.25	5.24	9.92	7.28	8.44	7.58	8.58	12.05
B	Atriplex canescens	2.02	.98	1.58	.76	.34	.96	.78	.40
B	Ceratoides lanata	2.40	4.69	.78	.24	.24	.41	.40	.40
B	Chrysothamnus viscidiflorus stenophyllus	1.63	2.69	.67	.42	1.07	1.70	.76	1.56
B	Gutierrezia sarothrae	.51	.97	1.05	3.45	1.83	.40	3.61	2.43
B	Juniperus osteosperma	-	.15	-	-	-	-	-	-
B	Opuntia sp.	-	-	-	-	-	.08	.15	-
B	Pediocactus simpsonii	-	.03	-	-	.01	-	-	.15
B	Pinus edulis	1.00	2.11	3.06	3.54	4.35	6.95	6.48	7.90
B	Symphoricarpos oreophilus	-	-	-	-	.15	-	-	-
Total for Browse		15.82	16.87	17.09	15.70	16.45	18.08	20.76	24.89

POINT-QUARTER TREE DATA--

Management unit 25C, Study no: 9

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Pinus edulis	40	-	40	39	3.5	-	5.9	5.6

BASIC COVER--

Management unit 25C, Study no: 9

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	23.49	25.57	27.10	21.81	22.93
Rock	29.15	29.29	35.18	29.46	41.95
Pavement	11.21	20.95	21.31	20.69	9.42
Litter	27.62	23.70	24.66	30.24	28.82
Cryptogams	.00	0	.66	.57	.43
Bare Ground	11.69	17.37	4.47	7.47	10.86

PELLET GROUP DATA--

Management unit 25C, Study no: 9

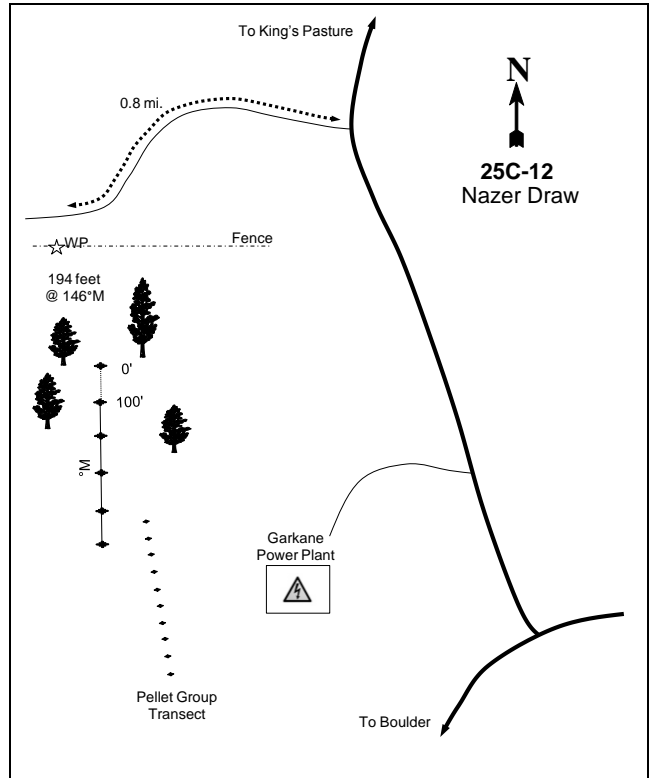
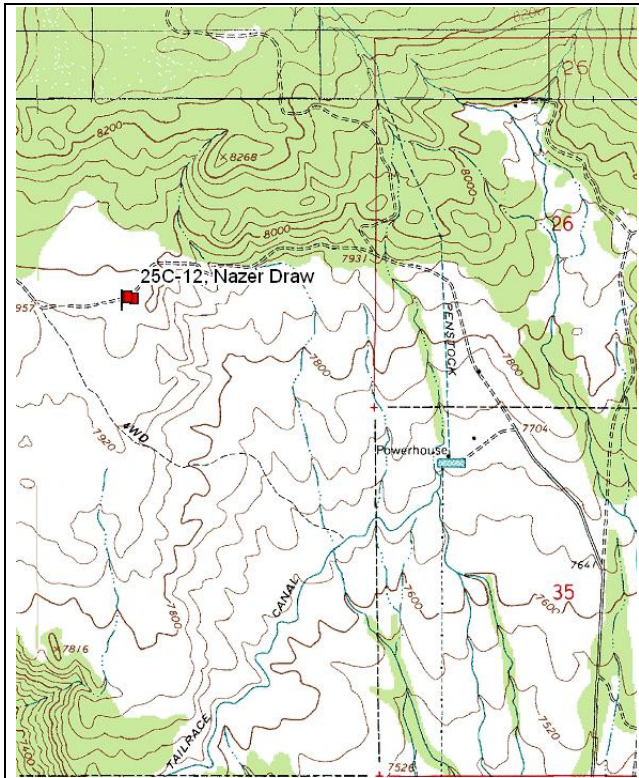
Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	33	38	8	83	23	-	-	-	-
Horse	-	1	-	-	-	-	-	-	-
Elk	30	37	26	57	17	54 (133)	78 (193)	69 (170)	57 (141)
Deer	33	37	23	32	31	40 (99)	66 (164)	22 (55)	52 (127)
Cattle	-	4	1	-	1	4 (10)	3 (7)	-	4 (9)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 9

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>									
94	<b>4440</b>	24	64	12	240	10	11	7	16/27
98	<b>2660</b>	26	59	14	240	32	.75	9	13/21
03	<b>4660</b>	6	57	37	-	35	22	12	13/22
08	<b>4080</b>	1	55	43	-	47	46	21	12/22
13	<b>4080</b>	4	79	17	140	51	36	9	12/24
<i>Atriplex canescens</i>									
94	<b>460</b>	9	78	13	-	22	4	9	22/28
98	<b>340</b>	18	71	12	-	65	12	6	20/27
03	<b>360</b>	6	67	28	-	44	33	6	22/27
08	<b>480</b>	8	25	67	20	58	21	17	29/39
13	<b>400</b>	25	60	15	-	5	85	0	20/27
<i>Ceratoides lanata</i>									
94	<b>18520</b>	11	89	0	-	17	11	0	5/6
98	<b>11900</b>	23	77	0	-	62	29	0	4/5
03	<b>4760</b>	1	98	0	-	21	71	0	5/5
08	<b>2880</b>	1	67	31	-	28	69	19	4/5
13	<b>2620</b>	4	95	1	20	24	55	2	4/5
<i>Chrysothamnus nauseosus</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>60</b>	100	0	-	-	0	0	0	-/-
03	<b>60</b>	67	33	-	-	67	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
94	<b>1260</b>	44	56	0	60	5	5	0	9/16
98	<b>2820</b>	17	83	0	-	0	0	0	9/13
03	<b>1480</b>	0	92	8	-	0	0	0	7/12
08	<b>1240</b>	0	44	56	-	2	0	21	6/11
13	<b>1100</b>	9	91	0	-	38	4	38	7/13
<i>Echinocereus sp.</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>20</b>	0	100	-	-	0	0	0	3/4

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>Gutierrezia sarothrae</i>									
94	<b>1360</b>	22	76	1	-	0	0	0	7/9
98	<b>1320</b>	20	79	2	20	0	0	2	9/10
03	<b>4040</b>	46	51	3	160	2	0	1	6/7
08	<b>5940</b>	0	71	29	20	0	0	11	7/9
13	<b>9560</b>	41	59	0	60	0	0	0	5/6
<i>Opuntia sp.</i>									
94	<b>60</b>	0	100	-	-	0	0	0	4/11
98	<b>40</b>	0	100	-	-	0	0	0	5/11
03	<b>60</b>	0	100	-	-	0	0	0	3/11
08	<b>20</b>	0	100	-	-	0	0	0	4/10
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Pediocactus simpsonii</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>20</b>	0	100	-	-	0	0	0	1/4
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	2/3
13	<b>100</b>	20	80	-	20	0	0	0	1/3
<i>Pinus edulis</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>20</b>	100	0	-	-	0	0	0	-/-
03	<b>160</b>	13	88	-	-	0	0	0	-/-
08	<b>140</b>	0	100	-	-	0	0	0	-/-
13	<b>120</b>	33	67	-	20	0	0	0	-/-
<i>Yucca sp.</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	7/10
13	<b>0</b>	0	0	-	-	0	0	0	-/-

NAZER DRAW - TREND STUDY NO. 25C-12



**Location Information**

USGS 7.5 min Map Info      Boulder Town; Township 32S, Range 4E, Section 27  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 460065 East 4204984 North

**Transect Information**

Browse Tag # (0' Stake)      7131  
 Transect Bearing              161° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      No Rebar

**Directions to Site**

Travel north from Boulder on SR 12 for approximately 5.0 miles to the Garkane Power Plant Road. Turn left (west) onto this road. Go 0.95 miles to a cattleguard. Continue 0.2 miles to a minor fork. Bear left onto a rough road and go 0.8 miles. This road is now closed so you now have to walk the 0.8 miles to the site. Stop along the fence by an orange fence post, which serves as a witness post for the range trend study and adjacent pellet group transect. The transect starts 195 feet south of the fence. The 0-foot baseline stake is a 1 1/2-foot tall fence post marked with browse tag #7131.

### Site Information

Land Ownership USFS  
Allotment Boulder  
Elevation 7,980ft (2,432m)  
Aspect Flat  
Slope 3-5%  
Sample Dates 07/22/1987, 09/17/1991, 08/03/1994, 07/30/1998, 08/26/2003, 08/20/2008, 08/07/2013

### DISTURBANCE HISTORY--

Management unit 25C, Study no: 12

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Seeding	-	-	1955	1,200

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Winter

### VEGETATION HISTORY--

Management unit 25C, Study no: 12

Year	Vegetation Type <sup>1</sup>	Woodland Succession
1985-2013	Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Deer pellet groups were found in moderate abundance in 1991 and 1994 (Jense, et al., 1991; Shields, et al., 1994). Since 1998, deer pellet groups have also been sampled in moderate abundance (Table - Pellet Group Data).

### Site Potential

1981-2010 Average Annual Precipitation 16 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site Mountain Shallow Loam (Ponderosa Pine)  
NRCS Ecological Site # R047XB450UT

### SOIL ANALYSIS DATA--

Management unit 25C, Study no: 12

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	60.0	21.8	18.2	5.6	0.4	2.4	10.3	112.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

When established in 1985, black sagebrush (*Artemisia nova*) was the dominant browse component on the site with a diverse community of perennial grasses and forbs within the understory (Table - Browse Trends, Table - Herbaceous Trends). Ponderosa pine (*Pinus ponderosa*) was also present on the site as a small, scattered population of saplings. Over the duration of the study, the black sagebrush population has remained dominant with nearly the same composition of grasses and forbs (Table - Browse Trends; Table - Herbaceous Trends); however, ponderosa pine has steadily increased in cover, while maintaining nearly the same density since 1998

(Table - Browse Trends; Table - Point-Quarter Tree Data). The invasive annual grass cheatgrass (*Bromus tectorum*) was first observed on the site in 2003, and has maintained low frequency and cover.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 25C, study no: 12

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	30.0	10.0	6.4	16.6	0.0	6.8	0.0	<b>69.7</b>	Good
1998	30.0	11.5	15.0	27.9	0.0	10.0	0.0	<b>94.4</b>	Excellent
2003	30.0	8.3	9.5	12.2	0.0	4.0	0.0	<b>64.0</b>	Fair-Good
2008	30.0	7.8	8.1	14.9	0.0	8.1	0.0	<b>61.8</b>	Fair
2013	30.0	12.2	5.5	15.0	0.0	5.5	0.0	<b>68.2</b>	Good

#### HERBACEOUS TRENDS--

Management unit 25C, Study no: 12

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	Agropyron cristatum	b121	a50	a81	a75	a55	1.55	.98	.86	1.58	.81
G	Agropyron intermedium	a19	b57	ab30	ab39	ab34	.25	1.27	.42	.22	.24
G	Bouteloua gracilis	173	212	195	182	173	5.54	9.67	4.21	4.40	4.97
G	Bromus inermis	5	5	-	7	11	.03	.15	-	.04	.04
G	Bromus tectorum (a)	-	-	1	1	-	-	-	.03	.00	-
G	Carex sp.	ab1	ab6	a-	b12	b19	.00	.44	-	.22	.58
G	Oryzopsis hymenoides	2	-	-	-	-	.03	-	-	-	-
G	Sitanion hystrix	a15	b81	b64	b70	a35	.88	1.44	.55	.87	.44
G	Stipa comata	-	-	3	5	8	-	-	.03	.07	.39
Total for Annual Grasses		0	0	1	1	0	0	0	0.03	0.00	0
Total for Perennial Grasses		336	411	373	390	335	8.30	13.95	6.08	7.43	7.48
Total for Grasses		336	411	374	391	335	8.30	13.95	6.11	7.44	7.48
F	Agoseris glauca	-	3	-	-	-	-	.00	-	-	-
F	Antennaria parvifolia	-	5	-	-	-	-	.15	-	-	-
F	Arabis sp.	-	5	-	4	6	-	.01	-	.01	.07
F	Artemesia carruthii	ab22	b39	a9	a14	a12	.20	.91	.25	.08	.05
F	Astragalus newberryi	-	6	-	1	1	-	.06	-	.00	.00
F	Calochortus nuttallii	-	-	3	-	3	-	-	.03	-	.01
F	Castilleja chromosa	ab4	b19	ab1	ab3	a-	.01	.37	.00	.03	-
F	Castilleja linariaefolia	ab3	b15	a-	a-	ab3	.01	.21	-	-	.03
F	Collinsia parviflora (a)	-	-	-	-	2	-	-	-	-	.03
F	Comandra pallida	ab8	b22	a-	ab7	ab4	.04	.49	.00	.01	.03
F	Cordylanthus sp. (a)	a-	a-	a-	a-	b14	-	-	-	-	.09
F	Crepis acuminata	1	3	5	-	-	.03	.09	.01	-	-
F	Cryptantha sp.	b25	ab10	a-	ab3	ab2	.09	.09	-	.01	.01
F	Descurainia pinnata (a)	-	-	6	-	-	-	-	.01	-	-
F	Draba sp. (a)	-	-	1	-	-	-	-	.00	-	-

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
F	<i>Erigeron divergens</i>	ab3	b41	a-	a-	ab4	.01	.35	-	-	.01
F	<i>Eriogonum alatum</i>	ab18	b26	a5	ab9	a3	.15	.35	.06	.51	.09
F	<i>Eriogonum racemosum</i>	90	100	63	68	75	.72	.96	.60	.46	.51
F	<i>Eriogonum umbellatum</i>	ab57	ab56	a39	ab58	b75	.82	.88	.57	.73	.89
F	<i>Gayophytum ramosissimum</i> (a)	b14	a-	a-	a-	a-	.03	-	-	-	-
F	<i>Hymenopappus filifolius</i>	-	-	-	4	-	-	-	-	.00	-
F	<i>Hymenoxys acaulis</i>	ab3	b13	a-	a-	ab3	.03	.09	-	-	.03
F	<i>Hymenoxys cooperi</i>	1	2	-	-	2	.00	.15	-	-	.00
F	<i>Lepidium densiflorum</i> (a)	ab3	b40	ab3	ab2	a-	.00	.10	.03	.01	-
F	<i>Linum lewisii</i>	5	6	7	6	4	.06	.05	.02	.25	.01
F	<i>Lomatium</i> sp.	-	3	5	3	-	-	.00	.01	.03	-
F	<i>Lotus utahensis</i>	c59	bc30	a-	bc37	b24	.43	.75	-	1.02	.43
F	<i>Lupinus kingii</i> (a)	ab1	b10	a-	ab4	a-	.00	.31	-	.01	.15
F	<i>Lychnis drummondii</i>	3	2	-	-	-	.00	.00	-	-	-
F	<i>Lygodesmia spinosa</i>	14	8	2	6	9	.20	.04	.03	.06	.13
F	<i>Oenothera pallida</i>	b15	ab6	a-	ab8	ab2	.05	.03	-	.15	.03
F	<i>Orthocarpus purpureo-albus</i> (a)	a-	b48	b36	ab11	a-	-	1.12	.52	.13	-
F	<i>Penstemon comarrhenus</i>	ab14	b42	a6	ab17	a3	.08	.34	.05	.16	.00
F	<i>Penstemon</i> sp.	b16	a-	ab6	a-	ab3	.06	-	.01	-	.06
F	<i>Phlox longifolia</i>	52	36	42	53	52	.14	.15	.24	.28	.28
F	<i>Physaria</i> sp.	-	-	-	-	1	-	-	-	-	.00
F	<i>Polygonum douglasii</i> (a)	-	8	-	1	1	-	.07	-	.00	.00
F	<i>Senecio douglasii</i>	a-	a-	a-	ab2	b9	-	-	-	.03	.05
F	<i>Sphaeralcea coccinea</i>	b11	a-	b11	ab9	ab2	.19	-	.10	.18	.01
F	<i>Taraxacum officinale</i>	4	-	-	-	-	.03	-	-	-	-
F	<i>Townsendia incana</i>	1	3	-	-	-	.00	.00	-	-	-
Total for Annual Forbs		18	106	46	18	17	0.04	1.60	0.57	0.15	0.27
Total for Perennial Forbs		429	501	204	312	302	3.39	6.60	2.02	4.06	2.77
Total for Forbs		447	607	250	330	319	3.43	8.20	2.59	4.22	3.04

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 12

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'98	'03	'08	'13	'03	'08	'13
B	<i>Amelanchier utahensis</i>	.30	.45	.53	.30	.53	.18	.13	.53
B	<i>Artemisia nova</i>	17.12	17.41	25.88	16.39	21.99	25.63	19.36	26.11
B	<i>Artemisia tridentata tridentata</i>	-	-	-	.38	-	-	-	-
B	<i>Chrysothamnus depressus</i>	.06	.48	.09	.10	.33	-	-	-
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	.36	1.11	.72	.28	.19	.68	.61	.41
B	<i>Eriogonum microthecum</i>	.13	.80	.25	.16	.13	.16	.05	.25
B	<i>Gutierrezia sarothrae</i>	.06	.42	.21	.03	.00	.15	-	-

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Pediocactus simpsonii	-	.03	.03	.06	.01	.05	.05	-
B	Pinus edulis	-	-	-	.15	1.01	.03	1.53	1.95
B	Pinus ponderosa	.18	.31	.30	.30	-	.55	-	-
B	Purshia tridentata	7.43	5.48	7.10	5.16	9.90	6.06	8.85	12.75
B	Quercus gambelii	2.47	5.37	3.19	3.45	5.00	4.08	.66	8.13
Total for Browse		28.14	31.87	38.32	26.77	39.12	37.57	31.24	50.13

POINT-QUARTER TREE DATA--

Management unit 25C, Study no: 12

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Pinus edulis	20	20	21	21	3.5	3.5	3.9	3.3
Pinus ponderosa	33	32	33	35	6.0	7.9	4.0	9.1
Pseudotsuga menziesii	<18	<18	<18	18	-	-	-	18.5

BASIC COVER--

Management unit 25C, Study no: 12

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	33.47	49.48	42.52	37.54	49.44
Rock	14.85	15.41	14.18	14.01	10.20
Pavement	4.99	12.05	6.05	11.26	5.95
Litter	34.91	54.52	42.09	40.19	51.78
Cryptogams	.00	0	.38	0	1.06
Bare Ground	12.34	10.12	10.93	8.87	5.28

PELLET GROUP DATA--

Management unit 25C, Study no: 12

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	23	10	12	35	7	-	-	-	-
Elk	5	12	6	1	5	9 (22)	11 (26)	15 (36)	11 (28)
Deer	35	24	38	43	35	27 (67)	63 (155)	24 (60)	47 (116)
Cattle	-	2	4	1	-	6 (15)	5 (13)	1 (2)	2 (5)



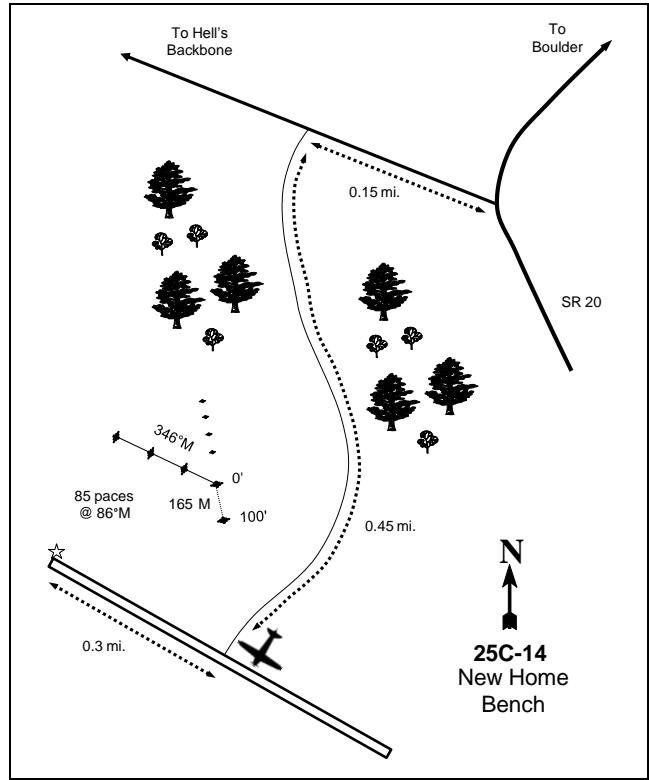
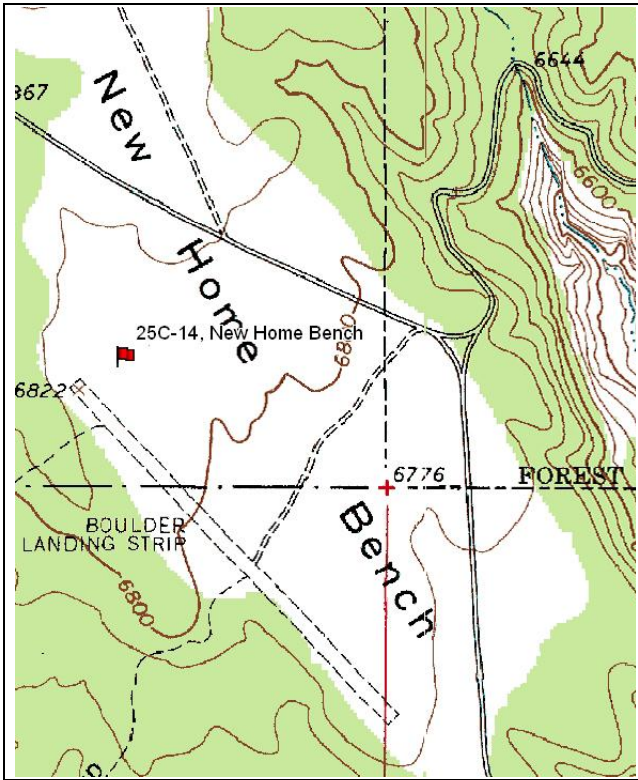
BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 12

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
94	<b>40</b>	0	100	0	-	0	50	0	18/20	
98	<b>100</b>	40	60	0	-	20	0	0	22/30	
03	<b>80</b>	25	50	25	-	25	50	25	20/19	
08	<b>200</b>	70	30	0	-	10	10	0	26/30	
13	<b>140</b>	57	43	0	-	29	43	14	17/18	
<i>Artemisia nova</i>										
94	<b>8820</b>	19	59	22	14640	22	0	4	13/21	
98	<b>11080</b>	42	40	18	2000	15	.36	2	15/26	
03	<b>19540</b>	23	60	18	180	0	0	9	12/18	
08	<b>18400</b>	17	52	31	820	18	4	12	11/17	
13	<b>10060</b>	10	74	16	-	25	25	15	12/23	
<i>Artemisia tridentata tridentata</i>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	19/33	
<i>Cercocarpus montanus</i>										
94	<b>20</b>	0	100	-	-	0	0	0	19/16	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	20/20	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	21/33	
<i>Chrysothamnus depressus</i>										
94	<b>280</b>	0	93	7	-	14	0	0	4/8	
98	<b>180</b>	0	100	0	-	0	0	0	3/8	
03	<b>100</b>	0	60	40	-	40	60	0	4/8	
08	<b>260</b>	8	69	23	-	15	46	8	4/7	
13	<b>160</b>	25	75	0	-	0	0	0	5/8	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
94	<b>360</b>	0	100	0	-	0	0	0	7/12	
98	<b>540</b>	33	63	4	-	0	0	4	26/34	
03	<b>400</b>	0	85	15	-	5	0	10	8/11	
08	<b>280</b>	7	71	21	20	0	7	7	12/14	
13	<b>400</b>	20	80	0	-	0	5	35	9/13	

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>Eriogonum microthecum</i>									
94	<b>640</b>	19	81	0	-	6	0	0	4/5
98	<b>800</b>	35	65	0	60	3	0	0	6/7
03	<b>840</b>	7	93	0	-	43	7	0	6/6
08	<b>680</b>	3	94	3	-	3	6	0	5/7
13	<b>400</b>	0	100	0	20	5	10	0	7/9
<i>Gutierrezia sarothrae</i>									
94	<b>60</b>	0	67	33	-	0	0	0	8/6
98	<b>660</b>	12	88	0	100	0	0	0	9/8
03	<b>220</b>	0	100	0	-	0	0	9	8/7
08	<b>220</b>	0	100	0	-	0	0	0	8/8
13	<b>60</b>	100	0	0	-	0	0	0	7/7
<i>Opuntia sp.</i>									
94	<b>40</b>	0	100	-	-	0	0	0	2/3
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Pediocactus simpsonii</i>									
94	<b>0</b>	0	0	0	-	0	0	0	-/-
98	<b>200</b>	20	80	0	-	0	0	0	3/5
03	<b>200</b>	20	70	10	-	0	0	10	2/3
08	<b>260</b>	15	85	0	-	0	0	0	2/3
13	<b>80</b>	0	100	0	20	0	0	0	3/5
<i>Pinus edulis</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>20</b>	100	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Pinus ponderosa</i>									
94	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>80</b>	100	0	-	-	0	0	0	-/-
03	<b>40</b>	100	0	-	-	0	0	0	-/-
08	<b>40</b>	100	0	-	20	0	0	0	-/-
13	<b>20</b>	100	0	-	-	0	0	100	-/-
<i>Purshia tridentata</i>									
94	<b>1500</b>	3	87	11	20	60	16	0	12/37
98	<b>540</b>	22	74	4	-	19	26	0	21/52
03	<b>1440</b>	1	53	46	-	3	97	32	16/41
08	<b>1720</b>	2	83	15	-	60	28	2	18/36
13	<b>1480</b>	0	100	0	180	11	82	31	20/40

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Quercus gambelii</i>										
94	<b>0</b>	0	0	0	-	0	0	0	-/-	
98	<b>1680</b>	24	74	2	520	0	0	1	52/47	
03	<b>1500</b>	28	67	5	-	0	0	5	29/17	
08	<b>1480</b>	31	59	9	100	0	0	4	52/26	
13	<b>960</b>	31	69	0	160	4	0	0	20/17	
<i>Sclerocactus sp.</i>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>140</b>	71	29	-	-	0	0	0	3/4	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>60</b>	0	100	-	-	0	0	0	2/3	
13	<b>0</b>	0	0	-	-	0	0	0	2/5	
<i>Tetradymia canescens</i>										
94	<b>0</b>	0	0	0	-	0	0	0	6/7	
98	<b>20</b>	0	100	0	-	0	0	0	6/7	
03	<b>40</b>	50	0	50	-	0	0	0	7/6	
08	<b>20</b>	0	100	0	-	0	0	0	6/4	
13	<b>20</b>	100	0	0	-	0	0	0	-/-	

NEW HOME BENCH - TREND STUDY NO. 25C-14



**Location Information**

USGS 7.5 min Map Info      Boulder Town; Township 33S, Range 4E, Section 33  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 458949 East 4193601 North

**Transect Information**

Browse Tag # (0' Stake)      7145  
 Transect Bearing              165° magnetic, Lines 2-4: 346° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement        Standard

**Directions to Site**

Take SR 12 southwest out of Boulder for approximately 3 miles to the top of the bench above Dry Hollow. Turn onto the Hells Backbone-Salt Gulch Road. Travel 0.15 miles northwest to a road turning off to the left. Go 0.45 miles on this road to the Boulder airstrip. Turn right and drive down the airstrip 0.3 miles. The transect starts approximately 85 paces from the end of the airstrip, bearing 86 degrees magnetic. The 0-foot baseline stake is marked by browse tag #7145.

### Site Information

Land Ownership USFS  
Allotment Boulder  
Elevation 6,830ft (2,082m)  
Aspect South  
Slope 2-5%  
Sample Dates 07/14/1987, 09/05/1991, 07/28/1998, 09/09/2003, 08/19/2008, 08/13/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer; Elk, Crucial Winter

#### VEGETATION HISTORY--

Management unit 25C, Study no: 14

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Deer pellet groups have been consistently sampled in high abundance each sample year since 1998 (Table - Pellet Group Data). There is another transect near by that is not associated with the study.

### Site Potential

1981-2010 Average Annual Precipitation 11 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site [Semidesert Sandy Loam \(Wyoming Big Sagebrush\)](#)  
NRCS Ecological Site # R035XY216UT

#### SOIL ANALYSIS DATA--

Management unit 25C, Study no: 14

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	69.4	12.0	18.6	6.8	0.5	1.0	12.4	112.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

Since the establishment of the study in 1985, the dominant species on the site has remained Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with blue grama (*Bouteloua gracilis*) as the dominant perennial grass species (Appendix B -Pre-1992 Data). Additionally, pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have been found interspersed throughout the site. The annual and perennial forb communities have remained limited since 1998 (Table - Herbaceous Trends). The annual invasive grass species cheatgrass was first observed in 2008, and again in 2013 with low frequency and cover (Table - Herbaceous Trends). Although trends within the pinyon-juniper community remain stable, it is possible that tree cover and density may increase on the site, and without disturbance may become the dominant species over time.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 25C, study no: 14

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	23.4	4.5	6.6	13.8	-6.5	0.0	0.0	<b>41.8</b>	Fair
2003	21.7	-12.3	0.0	5.1	0.0	0.0	0.0	<b>14.5</b>	Poor
2008	16.2	-6.3	7.5	3.1	0.0	0.0	0.0	<b>20.5</b>	Poor
2013	17.4	1.5	4.5	9.8	0.0	0.0	0.0	<b>33.2</b>	Fair

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 14

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Bouteloua gracilis</i>	<sub>b</sub> 105	<sub>ab</sub> 90	<sub>a</sub> 59	<sub>a</sub> 68	4.32	2.29	1.17	3.15
G	<i>Bromus tectorum</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>ab</sub> 2	<sub>b</sub> 6	-	-	.01	.04
G	<i>Oryzopsis hymenoides</i>	<sub>b</sub> 6	<sub>a</sub> -	<sub>b</sub> 15	<sub>a</sub> -	.05	-	.13	-
G	<i>Sitanion hystrix</i>	<sub>b</sub> 62	<sub>a</sub> 10	<sub>a</sub> 6	<sub>a</sub> 12	1.23	.08	.07	.28
G	<i>Stipa comata</i>	<sub>c</sub> 51	<sub>a</sub> 3	<sub>ab</sub> 22	<sub>a</sub> 49	1.28	.15	.19	1.49
G	<i>Vulpia octoflora</i> (a)	<sub>c</sub> 243	<sub>a</sub> -	<sub>ab</sub> 12	<sub>a</sub> 2	8.66	-	.02	.01
Total for Annual Grasses		243	0	14	8	8.66	0	0.03	0.04
Total for Perennial Grasses		224	103	102	129	6.89	2.53	1.57	4.92
Total for Grasses		467	103	116	137	15.55	2.53	1.60	4.97
F	<i>Astragalus</i> sp.	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 11	-	-	-	.66
F	<i>Cryptantha fulvocanescens</i>	-	-	-	2	-	-	-	.00
F	<i>Descurainia pinnata</i> (a)	<sub>ab</sub> 6	<sub>b</sub> 18	<sub>b</sub> 16	<sub>a</sub> -	.01	.11	.07	-
F	<i>Erigeron pumilus</i>	2	-	-	-	.00	-	-	-
F	<i>Eriogonum cernuum</i> (a)	<sub>a</sub> -	<sub>a</sub> 3	<sub>ab</sub> 7	<sub>a</sub> -	-	.00	.06	-
F	<i>Eriogonum</i> sp.	<sub>ab</sub> 8	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.06	-	-	-
F	<i>Lappula occidentalis</i> (a)	-	-	3	-	-	-	.00	-
F	<i>Penstemon</i> sp.	-	-	-	3	-	-	-	.03
F	<i>Phlox longifolia</i>	-	2	-	-	-	.00	-	-
F	<i>Senecio multilobatus</i>	-	1	-	-	-	.03	-	-
F	<i>Sisymbrium altissimum</i> (a)	-	1	-	-	-	.00	-	-
F	<i>Sphaeralcea coccinea</i>	<sub>a</sub> -	<sub>ab</sub> 1	<sub>ab</sub> 2	<sub>ab</sub> 9	-	.03	.01	.21
Total for Annual Forbs		6	22	26	0	0.01	0.13	0.14	0
Total for Perennial Forbs		10	4	2	25	0.06	0.06	0.01	0.91
Total for Forbs		16	26	28	25	0.07	0.19	0.15	0.91

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

BROWSE TRENDS--

Management unit 25C, Study no: 14

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	18.72	17.33	12.89	13.91	9.48	14.85	16.68
B	Chrysothamnus viscidiflorus viscidiflorus	-	-	-	.15	.03	.06	.15
B	Ephedra torreyana	-	.15	.03	-	-	-	-
B	Eriogonum microthecum	.03	.03	.03	-	-	-	.01
B	Gutierrezia sarothrae	.95	.43	.03	.63	.33	.10	.75
B	Juniperus osteosperma	.38	.38	1.26	.76	.45	.55	.50
B	Pinus edulis	-	.85	.85	1.01	1.06	1.70	2.20
Total for Browse		20.08	19.18	15.09	16.47	11.35	17.26	20.29

POINT-QUARTER TREE DATA--

Management unit 25C, Study no: 14

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniper osteosperma	26	28	30	29	3.7	3.4	3.6	4.6
Pinus edulis	28	28	26	28	3.4	3.5	4.3	5.2

BASIC COVER--

Management unit 25C, Study no: 14

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	31.96	20.92	16.76	22.24
Rock	.22	.24	.10	.05
Pavement	2.54	2.38	3.02	1.40
Litter	29.29	29.80	39.96	28.57
Cryptogams	12.32	6.17	4.41	3.55
Bare Ground	51.56	51.27	49.05	52.42

PELLET GROUP DATA--

Management unit 25C, Study no: 14

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	38	28	64	5	-	-	-	-
Elk	-	3	1	-	-	7 (17)	5 (12)	1 (2)
Deer	38	51	49	48	66 (163)	95 (235)	148 (366)	74 (184)
Cattle	-	-	1	2	2 (5)	-	4 (9)	1 (2)

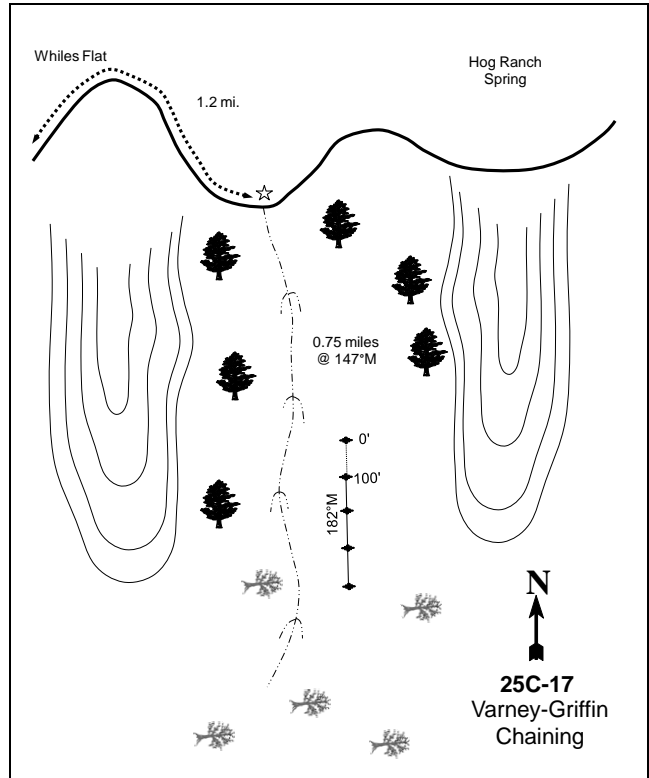
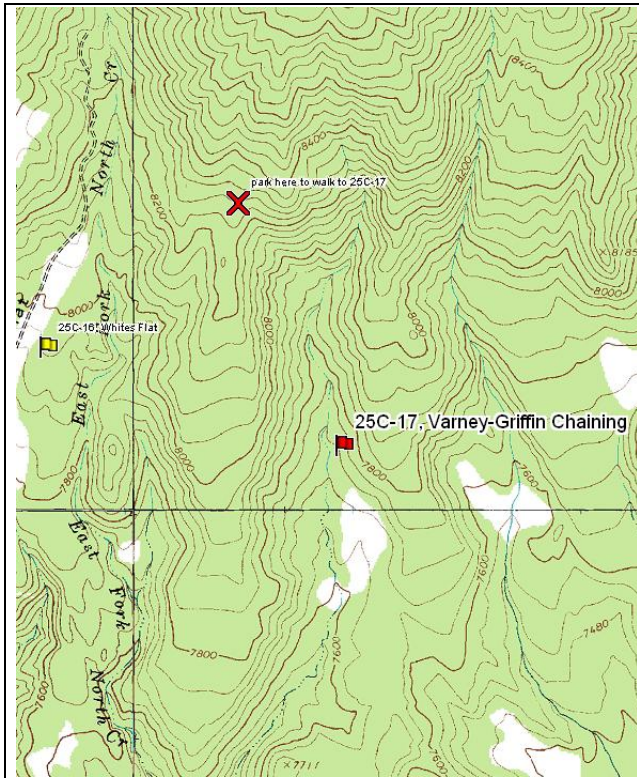
BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 14

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>									
98	4120	13	52	35	200	39	10	6	22/32
03	4100	0	8	91	-	52	8	70	25/36
08	3940	15	15	71	1680	29	17	55	24/36
13	3320	9	46	45	40	50	23	40	26/43
<i>Ceratoides lanata</i>									
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	100	0	11/5
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
98	0	0	0	0	-	0	0	0	-/-
03	120	33	50	17	-	0	0	0	11/10
08	40	50	50	0	-	0	0	0	17/15
13	280	0	100	0	40	0	7	0	12/17
<i>Ephedra torreyana</i>									
98	180	22	78	0	-	44	56	0	11/12
03	60	0	67	33	-	0	33	0	16/17
08	100	100	0	0	-	0	100	100	24/49
13	20	0	100	0	-	0	0	0	15/15
<i>Eriogonum microthecum</i>									
98	40	100	0	-	-	0	0	0	-/-
03	40	0	100	-	-	0	0	0	9/10
08	40	0	100	-	-	0	50	0	6/6
13	20	0	100	-	-	0	100	0	3/5
<i>Gutierrezia sarothrae</i>									
98	2720	29	70	1	360	0	0	0	8/9
03	1180	27	66	7	-	0	0	2	9/11
08	320	19	75	6	60	0	0	6	7/7
13	1800	18	81	1	60	0	0	1	8/10
<i>Juniperus osteosperma</i>									
98	20	100	0	-	60	0	0	0	-/-
03	60	67	33	-	-	0	0	0	-/-
08	60	67	33	-	-	0	0	0	-/-
13	20	100	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
98	80	0	100	-	-	0	0	0	2/7
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	3/23



		Age class distribution						Utilization	
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Pinus edulis									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>40</b>	50	50	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	40	0	0	0	-/-
13	<b>20</b>	0	100	-	-	0	0	0	-/-

VARNEY-GRIFFIN CHAINING - TREND STUDY NO. 25C-17



**Location Information**

USGS 7.5 min Map Info      Posy Lake; Township 34S, Range 1E, Section 01  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 434869 East 4192437 North

**Transect Information**

Browse Tag # (0' Stake)      7146  
 Transect Bearing              182° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement        Standard

**Directions to Site**

North Creek Road begins at mile marker 55 off of SR 12. From North Creek Reservoir, continue north on the main road for 2 miles to a fork. Turn right, go 2 miles to Whites Flat. Continue towards Hog Ranch Spring for 1.2 miles. Stop where the road curves across a large ridgetop. Walk along the east edge of this flat-topped ridge to where you can see the chaining in the drainage below. Hike down the side of the ridge toward the chaining. The study area is in the north end of this chained drainage. The study is marked by browse tag #7146.

**Site Information**

Land Ownership USFS  
 Allotment North Creek  
 Elevation 7,720ft (2,353m)  
 Aspect Southwest  
 Slope 8-10%  
 Sample Dates 07/27/1987, 09/08/1991, 08/18/1998, 08/06/2003, 08/19/2008, 08/13/2013

**DISTURBANCE HISTORY--**

Management unit 25C, Study no: 17

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1981	1,100
Seeding	-	-	1981	1,100
Bullhog	-	-	2003-2008	1,100

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter

**VEGETATION HISTORY--**

Management unit 25C, Study no: 17

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1998	Perennial Grass	Phase I
2003	Perennial Grass/Mountain Big Sagebrush	Phase I transitioning to Phase II
2008-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The site has had a variety of treatments, which has left the area well maintained for wildlife. Elk pellet groups have consistently been found in high abundance since 1998 (Table - Pellet Groups).

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

**SOIL ANALYSIS DATA--**

Management unit 25C, Study no: 17

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	73.1	12.4	14.6	6.1	0.3	1.4	12.7	134.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1987, the site was dominated by introduced perennial grass species, mainly crested wheatgrass (*Agropyron cristatum*), that were seeded following a chaining that occurred prior to study establishment. Perennial forbs were also found to be diverse and abundant (Appendix - Pre-1992). There

were sparse, young Utah juniper (*Juniperus osteosperma*), pinyon pine (*Pinus edulis*), and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) early on in the sample years. Introduced perennial grass species have decreased, but remained a major component of the site. As a result of continued tree reduction treatments, mountain big sagebrush has been reestablished and became the dominant species on the site (Table - Browse Trends).

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25C, study no: 17

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	10.4	13.0	10.9	30.0	0.0	10.0	0.0	<b>74.2</b>	Good
1998	15.5	11.6	2.7	10.8	0.0	9.8	0.0	<b>50.4</b>	Poor-Fair
2003	8.9	8.8	15.0	20.5	0.0	4.7	0.0	<b>57.9</b>	Fair
2008	13.7	14.8	15.0	17.0	0.0	1.2	0.0	<b>61.8</b>	Fair
2013	24.4	1.7	7.6	2.3	0.0	1.6	0.0	<b>37.6</b>	Poor

HERBACEOUS TRENDS--  
Management unit 25C, Study no: 17

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	c268	a136	a105	b204	13.38	3.07	2.67	3.77
G	Agropyron intermedium	b72	a14	a28	a20	1.15	.10	.38	.16
G	Bouteloua gracilis	a45	ab54	b69	ab43	.82	.97	2.25	.95
G	Bromus inermis	b211	a30	a42	a34	6.52	.34	.87	.15
G	Carex sp.	ab32	a3	b34	ab44	.46	.03	.42	2.46
G	Elymus salina	ab5	a-	b33	ab6	.15	-	.66	.22
G	Oryzopsis hymenoides	3	-	-	2	.00	-	-	.00
G	Poa fendleriana	ab26	a15	b45	a7	.78	.51	.89	.06
G	Sitanion hystrix	4	-	4	2	.00	-	.03	.00
G	Sporobolus cryptandrus	ab2	a-	b27	ab9	.00	-	.64	.07
G	Stipa comata	31	26	40	37	.43	.36	1.44	.64
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		699	278	427	408	23.74	5.41	10.27	8.52
Total for Grasses		699	278	427	408	23.74	5.41	10.27	8.52
F	Alyssum alyssoides (a)	b27	a-	a-	a-	.06	-	-	-
F	Androsace septentrionalis (a)	10	-	-	1	.04	-	-	.00
F	Arabis sp.	-	-	3	3	-	-	.00	.00
F	Artemisia ludoviciana	2	-	-	-	.15	-	-	-
F	Astragalus sp.	6	2	10	-	.04	.00	.05	-
F	Chaenactis douglasii	1	-	-	-	.00	-	-	-
F	Chenopodium fremontii (a)	-	2	3	-	-	.00	.00	-
F	Chenopodium leptophyllum(a)	a-	b15	ab3	a-	-	.53	.00	-
F	Comandra pallida	46	32	27	24	1.08	.21	.48	.14
F	Cryptantha sp.	b7	a-	a-	a-	.02	-	-	-

T y p e	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Dalea sp.	-	1	-	-	-	.00	-	-
F	Descurainia pinnata (a)	1	-	-	1	.00	-	-	.00
F	Erigeron sp.	9	-	2	3	.04	-	.00	.00
F	Eriogonum alatum	-	-	-	1	-	-	-	.00
F	Eriogonum racemosum	b10	b12	ab7	a-	.08	.05	.09	-
F	Eriogonum umbellatum	5	2	5	8	.04	.03	.03	.09
F	Ipomopsis aggregata	6	-	1	1	.16	-	.00	.00
F	Lappula occidentalis (a)	ab1	b11	a-	ab6	.00	.36	-	.01
F	Lesquerella rectipes	b8	a-	a-	ab1	.04	-	-	.00
F	Lotus utahensis	1	-	-	4	.15	-	-	.00
F	Lupinus argenteus	b68	a35	b69	a18	2.91	1.07	1.08	.16
F	Lychnis drummondii	2	-	3	-	.03	-	.03	-
F	Machaeranthera canescens	5	-	-	-	.00	-	-	-
F	Medicago sativa	-	-	-	1	.00	-	-	.00
F	Oenothera pallida	b14	ab12	b9	a-	.05	.19	.19	-
F	Oenothera sp.	7	-	-	-	.01	-	-	-
F	Penstemon comarrhenus	a-	a-	b29	ab6	-	-	.20	.01
F	Penstemon pachyphyllus	-	-	4	-	-	-	.06	-
F	Penstemon sp.	b7	ab1	a-	a-	.04	.03	-	-
F	Phlox longifolia	6	1	8	2	.01	.00	.02	.00
F	Polygonum douglasii (a)	6	-	-	2	.01	-	-	.00
F	Senecio multilobatus	a13	b142	a12	a22	.08	3.24	.08	.15
F	Sphaeralcea coccinea	3	7	-	4	.01	.03	-	.01
Total for Annual Forbs		45	28	6	10	0.12	0.90	0.01	0.02
Total for Perennial Forbs		226	247	189	98	5.00	4.88	2.35	0.62
Total for Forbs		271	275	195	108	5.12	5.79	2.36	0.64

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 17

T y p e	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia frigida	-	.21	.03	.41	.23	.05	.28
B	Artemisia tridentata vaseyana	5.81	8.66	5.33	7.22	9.56	6.05	11.03
B	Chrysothamnus nauseosus	-	-	-	-	-	-	.28
B	Chrysothamnus viscidiflorus viscidiflorus	.38	.82	.00	.06	.41	-	.61
B	Gutierrezia sarothrae	1.21	1.22	.05	.92	1.38	.06	.11
B	Juniperus osteosperma	1.12	1.92	.30	.78	1.43	.45	1.00
B	Opuntia sp.	-	-	-	.00	-	-	-
B	Pinus edulis	1.80	2.71	.15	-	4.33	.31	.53
B	Purshia tridentata	.38	.68	.41	.53	1.21	1.01	1.51
B	Quercus gambelii	2.52	3.47	1.64	3.47	2.90	2.46	3.60

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Symphoricarpos oreophilus</i>	.85	.98	.63	.63	.25	-	.60
B	<i>Tetradymia canescens</i>	.00	.03	.00	-	.08	.03	.23
Total for Browse		14.09	20.70	8.55	14.03	21.78	10.42	19.78

POINT-QUARTER TREE DATA--  
Management unit 25C, Study no: 17

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
<i>Juniperus osteosperma</i>	22	30	24	22	4.9	3.5	4.5	2.6
<i>Pinus edulis</i>	54	104	114	96	2.9	2.0	1.3	1.4

BASIC COVER--  
Management unit 25C, Study no: 17

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	48.51	29.84	24.14	27.36
Rock	.16	.23	.79	.28
Pavement	1.11	2.62	4.00	.64
Litter	68.40	55.40	48.08	54.49
Cryptogams	.92	0	.03	.00
Bare Ground	10.81	30.42	35.77	32.14

PELLET GROUP DATA--  
Management unit 25C, Study no: 17

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	52	20	67	18	-	-	-	-
Elk	13	41	28	36	41 (101)	71 (175)	39 (96)	42 (103)
Deer	9	9	10	13	26 (64)	1 (2)	1 (2)	13 (33)
Cattle	6	3	4	1	23 (57)	2 (5)	5 (13)	7 (16)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 17

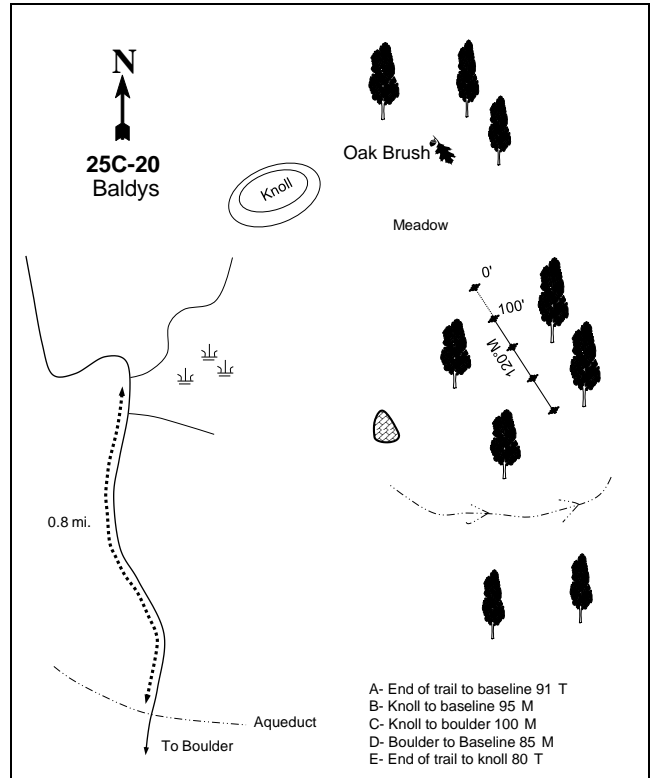
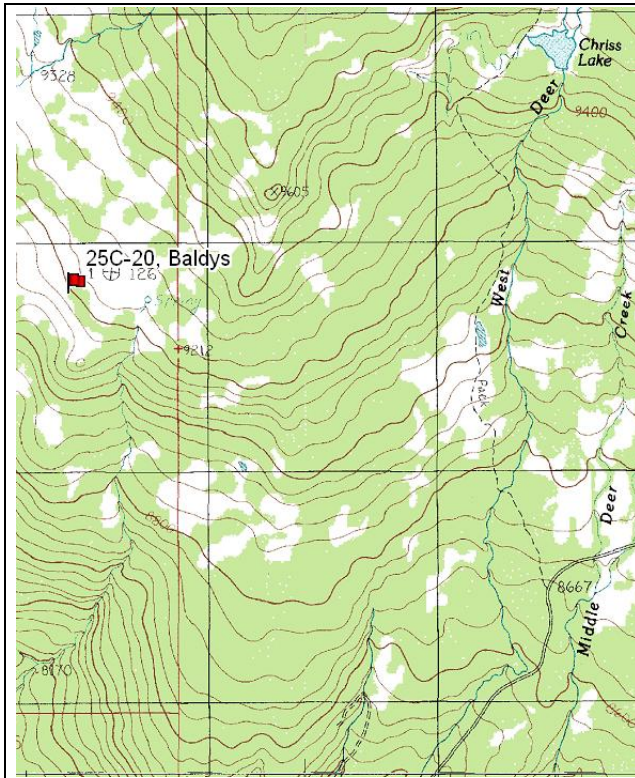
		Age class distribution			Utilization				
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
		<i>Amelanchier utahensis</i>							
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	52/54
08	0	0	0	-	-	0	0	0	74/65
13	0	0	0	-	-	0	0	0	41/51

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia frigida</i>									
98	0	0	0	-	-	0	0	0	-/-
03	140	0	100	-	-	0	0	0	14/13
08	120	0	100	-	-	17	0	0	7/8
13	200	10	90	-	-	20	0	0	8/14
<i>Artemisia tridentata vaseyana</i>									
98	820	27	71	2	80	5	0	0	29/40
03	780	8	77	15	-	28	5	0	31/44
08	1420	32	41	27	140	8	3	14	28/40
13	10640	88	11	1	420	1	.37	5	28/42
<i>Chrysothamnus nauseosus</i>									
98	0	0	0	0	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	46/57
08	20	0	0	100	-	100	0	0	45/61
13	100	0	80	20	-	60	20	20	34/43
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
98	180	11	89	0	40	0	0	0	21/21
03	1740	10	86	3	-	2	0	1	17/19
08	140	43	14	43	-	14	43	29	15/23
13	160	0	88	13	-	0	13	13	19/25
<i>Gutierrezia sarothrae</i>									
98	1400	47	53	0	520	0	0	0	12/13
03	2720	10	88	2	-	0	0	.73	9/8
08	380	21	79	0	160	0	0	0	7/7
13	860	2	81	16	-	0	5	21	9/14
<i>Juniperus osteosperma</i>									
98	40	100	0	-	-	0	0	0	-/-
03	60	0	100	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	20	100	0	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
98	120	83	17	0	20	0	0	0	-/-
03	180	56	44	0	-	0	0	0	-/-
08	100	40	20	40	-	0	0	40	-/-
13	40	100	0	0	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Purshia tridentata</i>									
98	<b>40</b>	0	100	0	-	0	0	0	33/51
03	<b>80</b>	0	75	25	-	25	25	25	36/57
08	<b>160</b>	38	38	25	-	13	38	13	24/43
13	<b>140</b>	14	86	0	-	29	71	43	30/52
<i>Quercus gambelii</i>									
98	<b>320</b>	13	69	19	-	0	0	6	62/38
03	<b>480</b>	0	100	0	-	0	0	0	43/32
08	<b>380</b>	37	63	0	-	0	0	0	46/27
13	<b>280</b>	100	0	0	-	0	0	0	41/55
<i>Symphoricarpos oreophilus</i>									
98	<b>20</b>	0	100	-	-	0	0	0	26/109
03	<b>20</b>	0	100	-	-	0	0	0	35/58
08	<b>20</b>	0	100	-	-	0	0	0	24/58
13	<b>40</b>	0	100	-	-	100	0	0	22/39
<i>Tetradymia canescens</i>									
98	<b>20</b>	0	100	0	-	0	0	0	20/28
03	<b>40</b>	0	100	0	-	0	0	0	18/29
08	<b>40</b>	0	0	100	-	0	0	100	13/14
13	<b>40</b>	0	100	0	-	0	50	0	11/23



BALDYS - TREND STUDY NO. 25C-20



**Location Information**

USGS 7.5 min Map Info      Deer Creek Lake; Township 32S, Range 4E, Section 14  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 462324 East 4207990 North

**Transect Information**

Browse Tag # (0' Stake)      7172  
 Transect Bearing              120° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

From SR 12 north of Boulder, turn onto the Garkane Power Plant road. Travel 1.8 miles to a fork, and go right toward Kings Pasture. Proceed 1.2 miles to a cattleguard and pipeline crossing. Continue 0.8 miles to a fork at a sharp curve in the road. Be sure to take the second fork (150-200 feet before the correct fork is another minor fork). Go 0.2 miles up a rocky road. Park at the creek, then walk across the creek and marshy area and follow the old road up the hill to the northeast. At the end of the road/trail where it tops out on the hill, take bearings to the clump of aspens where the study is located. The rocky knoll, shown on the map, is a small knoll. The aspen stand contains a spruce along line 2 and there are no other conifers around. From the knoll to the site is approximately 600 feet. It is marked by short fenceposts. The 0-foot baseline stake is marked by browse tag #7172.

**Site Information**

Land Ownership USFS  
 Allotment Boulder  
 Elevation 9,220ft (2,810m)  
 Aspect Southwest  
 Slope 10-20%  
 Sample Dates 07/23/1987, 09/10/1991, 08/01/1994, 07/29/1998, 08/26/2003, 08/20/2008, 08/14/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substainial Summer; Elk, Substainial Summer

## VEGETATION HISTORY--

Management unit 25C, Study no: 20

Year	Vegetation Type <sup>1</sup>
1987-2013	Quaking Aspen

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

Since 1998, elk presences on the site has been moderate to high (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 23 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site High Mountain Loam (Aspen)  
 NRCS Ecological Site # R047XB508UT

## SOIL ANALYSIS DATA--

Management unit 25C, Study no: 20

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	62.7	16.7	20.6	6.1	0.6	6.1	28.4	329.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has maintained a mature stand of quaking aspen (*Populus tremuloides*) as the dominant species with mountain snowberry (*Symphoricarpos oreophilus*), perennial grasses, and forbs occupying the majority of the understory (Appendix - Pre-1992) (Table - Browse Trends; Table - Herbaceous Trends).

## Trend Summary

HERBACEOUS TRENDS--  
Management unit 25C, Study no: 20

T y p e	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	Agropyron trachycaulum	b36	a8	a8	a14	a7	.19	.19	.07	.16	.12
G	Bouteloua gracilis	1	-	1	3	-	.00	-	.00	.03	-
G	Bromus anomalus	b17	ab4	ab2	a-	ab1	.63	.00	.03	-	.03
G	Bromus carinatus	-	-	3	1	7	-	.03	.18	.01	.10
G	Carex obtusata	ab120	ab82	a58	c140	bc109	.98	1.43	1.04	3.08	1.65
G	Dactylis glomerata	1	-	-	1	12	.00	-	-	.00	.31
G	Festuca ovina	44	50	42	57	35	.37	1.31	.53	.52	.58
G	Festuca thurberi	4	-	-	4	-	.07	-	-	.16	-
G	Juncus balticus	c39	a-	ab6	b23	b15	.59	-	.04	.14	.16
G	Koeleria cristata	5	-	-	1	5	.00	-	-	.00	.01
G	Muhlenbergia richardsonis	-	15	1	5	6	-	.48	.00	.09	.03
G	Poa fendleriana	111	96	76	77	79	3.09	2.12	2.50	1.45	1.02
G	Poa pratensis	a156	ab169	b190	ab173	c310	2.33	7.86	5.70	5.46	8.38
G	Sitanion hystrix	b48	a6	b73	b52	b68	.61	.12	2.34	1.06	1.21
G	Stipa columbiana	a-	b19	ab6	b16	c22	-	.13	.03	.35	.23
G	Stipa comata	-	-	-	3	-	-	-	-	.03	-
G	Stipa lettermani	c46	b15	ab9	a-	bc28	.76	.12	.16	-	.63
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		628	464	475	570	704	9.66	13.81	12.66	12.59	14.48
Total for Grasses		628	464	475	570	704	9.66	13.81	12.66	12.59	14.48
F	Achillea millefolium	a104	b143	a98	a84	a63	1.80	3.59	1.49	1.18	.66
F	Agoseris glauca	a-	ab5	b19	a-	a-	-	.03	.72	-	-
F	Allium cernuum	22	15	12	26	21	.20	.10	.33	.07	.16
F	Androsace septentrionalis (a)	3	10	-	3	6	.01	.16	-	.01	.01
F	Antennaria parvifolia	22	34	24	19	25	.11	.58	.29	.34	.57
F	Arabis drummondii	a-	a-	a-	b13	ab6	-	-	-	.05	.02
F	Artemesia carruthii	-	-	-	-	4	-	-	-	-	.06
F	Artemisia dracunculus	-	6	6	-	-	-	.01	.04	-	-
F	Artemisia ludoviciana	-	-	-	5	-	-	-	-	.04	-
F	Aster chilensis	5	19	14	11	15	.04	.06	.08	.19	.08
F	Astragalus convallarius	-	5	-	-	2	-	.18	-	-	.00
F	Castilleja linariaefolia	-	-	3	1	3	-	-	.03	.06	.01
F	Chenopodium album (a)	4	14	1	-	2	.01	.07	.00	-	.03
F	Cirsium vulgare	3	4	3	1	8	.06	.03	.04	.03	.18
F	Collomia linearis (a)	-	2	-	-	-	-	.00	-	-	-
F	Cymopterus lemmonii	ab15	a1	ab25	b23	b31	.09	.01	.39	.28	.12
F	Descurainia sp. (a)	-	5	-	-	-	-	.03	-	-	-
F	Erigeron eatonii	-	-	2	4	-	-	-	.00	.01	-
F	Erigeron flagellaris	30	29	36	19	23	.21	1.06	.26	.12	.26
F	Erigeron sp.	-	3	5	-	-	-	.00	.03	-	-
F	Eriogonum racemosum	-	-	-	3	-	-	-	-	.00	-

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
F	Geranium richardsonii	b <sup>48</sup>	ab <sup>32</sup>	ab <sup>17</sup>	ab <sup>20</sup>	a <sup>18</sup>	.57	.28	.29	.30	.20
F	Helenium hoopesii	42	43	38	44	44	.85	2.52	1.20	1.13	1.60
F	Ipomopsis aggregata	-	-	4	4	-	-	-	.03	.03	-
F	Iris missouriensis	ab <sup>16</sup>	b <sup>25</sup>	a <sup>5</sup>	a <sup>4</sup>	ab <sup>8</sup>	.42	.42	.15	.03	.10
F	Lappula occidentalis (a)	-	-	-	-	1	-	-	-	-	.00
F	Lathyrus lanszwertii	a <sup>23</sup>	b <sup>67</sup>	ab <sup>28</sup>	c <sup>85</sup>	a <sup>5</sup>	1.14	3.83	1.41	4.14	.21
F	Lomatium sp.	-	4	-	-	-	-	.15	-	-	-
F	Lupinus argenteus	ab <sup>33</sup>	b <sup>39</sup>	a <sup>19</sup>	ab <sup>29</sup>	ab <sup>47</sup>	1.66	2.33	.85	2.96	3.36
F	Lychnis drummondii	-	2	-	5	3	-	.00	-	.02	.03
F	Osmorhiza occidentalis	-	7	-	-	-	-	.01	-	-	-
F	Penstemon sp.	b <sup>10</sup>	a <sup>-</sup>	ab <sup>4</sup>	ab <sup>3</sup>	a <sup>-</sup>	.03	-	.00	.00	-
F	Phacelia heterophylla	-	-	2	-	5	-	-	.03	.03	.00
F	Phlox austromontana	ab <sup>35</sup>	a <sup>15</sup>	ab <sup>30</sup>	b <sup>41</sup>	ab <sup>37</sup>	.76	.60	.93	.80	.47
F	Phlox longifolia	-	-	-	1	7	-	-	-	.00	.33
F	Polygonum douglasii (a)	a <sup>9</sup>	ab <sup>13</sup>	a <sup>6</sup>	b <sup>30</sup>	a <sup>5</sup>	.02	.16	.02	.08	.02
F	Potentilla gracilis	b <sup>13</sup>	ab <sup>5</sup>	a <sup>-</sup>	ab <sup>1</sup>	ab <sup>3</sup>	.48	.06	-	.01	.06
F	Potentilla hippiana	6	1	3	1	1	.03	.03	.06	.00	.00
F	Senecio eremophilus	13	14	11	16	14	.08	.07	.14	.13	.25
F	Taraxacum officinale	a <sup>174</sup>	c <sup>227</sup>	ab <sup>169</sup>	bc <sup>220</sup>	ab <sup>175</sup>	1.29	8.17	3.08	6.14	2.40
F	Tragopogon dubius (a)	-	-	2	5	-	-	-	.03	.09	-
F	Trifolium gymnocarpon	-	-	-	-	5	-	-	-	-	.06
F	Unknown forb-perennial	-	-	5	-	-	-	-	.07	-	-
F	Vicia americana	b <sup>59</sup>	c <sup>105</sup>	ab <sup>53</sup>	a <sup>22</sup>	c <sup>134</sup>	.32	1.62	.91	.53	2.63
F	Viola sp.	a <sup>-</sup>	ab <sup>4</sup>	ab <sup>7</sup>	ab <sup>1</sup>	b <sup>7</sup>	-	.03	.24	.03	.16
Total for Annual Forbs		16	44	9	38	14	0.04	0.43	0.05	0.19	0.07
Total for Perennial Forbs		673	854	642	706	714	10.18	25.84	13.17	18.72	14.07
Total for Forbs		689	898	651	744	728	10.23	26.28	13.23	18.91	14.14

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 20

Type	Species	Quadrat Cover %					Line Intercept Cover%		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	.44	-	.33	.33	.18	.71	.43	.01
B	Populus tremuloides	.91	1.82	11.03	3.24	2.38	72.19	73.56	46.93
B	Ribes montigenum	.00	-	-	-	.01	.43	.06	.15
B	Rosa woodsii	.71	1.15	1.20	.61	.28	.65	1.36	.60
B	Symphoricarpos oreophilus	11.68	13.44	13.39	10.16	12.63	12.35	21.34	19.53
Total for Browse		13.75	16.42	25.96	14.35	15.50	86.33	96.75	67.22

POINT-QUARTER TREE DATA--  
Management unit 25C, Study no: 20

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Populus tremuloides	428	-	1,122	2,081	9.2	-	6.2	4.4

BASIC COVER--  
Management unit 25C, Study no: 20

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	29.06	49.69	42.98	47.62	43.98
Rock	9.58	5.89	7.72	8.57	5.59
Pavement	.45	1.04	.57	.83	.02
Litter	60.19	81.25	65.61	52.88	63.15
Cryptogams	0	.03	.15	.01	0
Bare Ground	4.38	4.92	1.15	4.02	3.22

PELLET GROUP DATA--  
Management unit 25C, Study no: 20

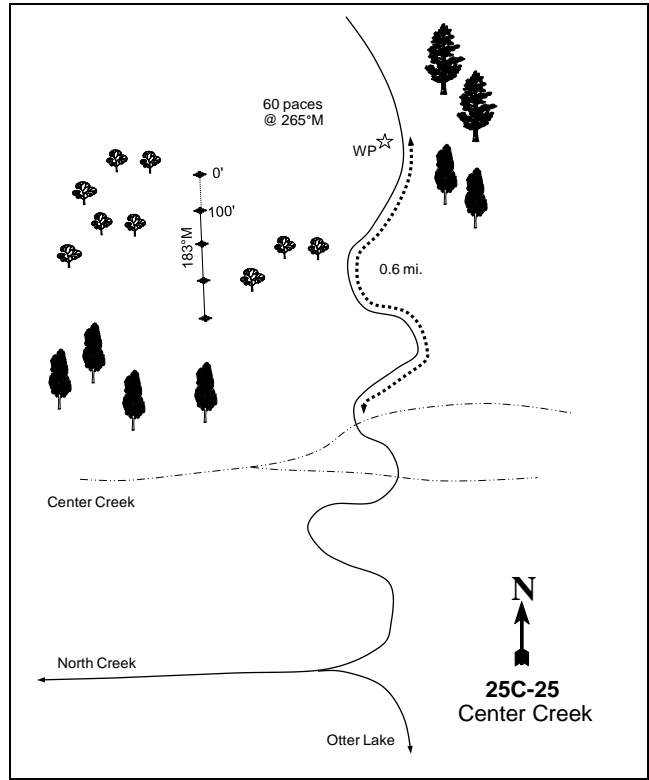
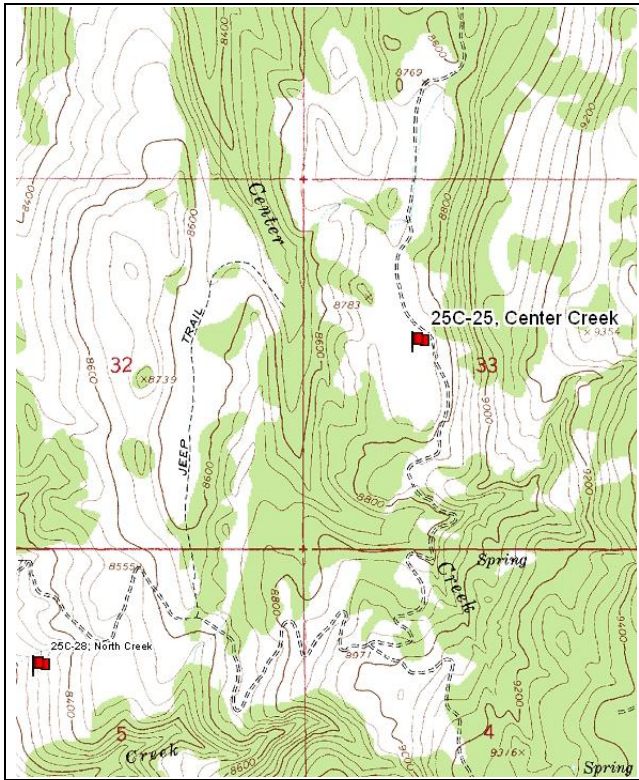
Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	1	-	1	3	1	-	-	-	-
Elk	3	12	18	18	12	32 (79)	32 (79)	45 (111)	18 (45)
Deer	1	5	2	5	3	7 (17)	12 (30)	20 (50)	5 (13)
Cattle	4	5	4	4	1	14 (35)	7 (16)	25 (63)	2 (5)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 20

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Amelanchier utahensis</b>										
94	<b>420</b>	0	100	0	-	71	0	0	10/6	
98	<b>0</b>	0	0	0	-	0	0	0	-/-	
03	<b>740</b>	62	19	19	-	22	16	5	19/9	
08	<b>640</b>	25	50	25	60	13	0	9	13/9	
13	<b>160</b>	75	25	0	-	13	0	0	18/19	
<b>Chrysothamnus nauseosus hololeucus</b>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>20</b>	100	0	-	-	0	0	0	10/9	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus viscidiflorus lanceolatus</b>										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	17/28	
08	0	0	0	-	-	0	0	0	14/20	
13	0	0	0	-	-	0	0	0	-/-	
<b>Populus tremuloides</b>										
94	0	0	0	0	-	0	0	0	-/-	
98	1000	48	48	4	-	10	0	4	-/-	
03	1180	53	46	2	-	15	0	0	-/-	
08	1100	44	51	5	140	15	13	16	-/-	
13	1140	60	39	2	120	7	0	2	-/-	
<b>Quercus gambelii</b>										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	20/17	
<b>Ribes montigenum</b>										
94	60	0	100	-	-	0	0	0	19/63	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	100	40	60	-	-	0	0	0	21/34	
13	60	33	67	-	-	0	0	0	28/37	
<b>Rosa woodsii</b>										
94	1340	30	69	1	20	0	0	0	14/11	
98	1540	36	61	3	240	1	0	0	20/15	
03	2440	0	98	2	-	0	0	.81	13/8	
08	2020	21	78	1	-	0	0	.99	16/8	
13	960	52	48	0	-	0	0	0	17/13	
<b>Symphoricarpos oreophilus</b>										
94	5780	7	93	0	20	3	0	0	16/24	
98	5080	24	75	0	120	2	.39	0	20/29	
03	6600	16	82	2	-	0	0	0	16/27	
08	7720	11	83	6	120	4	2	3	17/26	
13	6080	20	80	0	80	8	0	0	18/28	

CENTER CREEK - TREND STUDY NO. 25C-25



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Grass Lakes; Township 32S, Range 1W, Section 33  
NAD 83, UTM Zone 12, 420274 East 4204061 North

**Transect Information**

Browse Tag # (0' Stake)	Red
Transect Bearing	183° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)
Belt Marker Placement	Standard

**Directions to Site**

From the intersection of SR 12 and Rt. 1660 (to 22) turn left onto Johns Flat Road. Go 17.2 miles to the Grass Lake Road (USFS sign) and turn east. Travel 1.2 miles on this road to a fork by some fields. Turn right and continue 0.4 miles to the Horse Creek Fork. Turn left and go 1.15 miles to a fork with a sign. Stay left and continue 0.25 miles on the main road. Past the buildings at Birch Creek, take the right fork and go 0.6 miles. Stay left at the fork and go 0.75 miles to a cattleguard. Continue 0.75 miles to a fork. Stay left and go 1.65 miles to a USFS enclosure. Continue 2.55 miles to a cattleguard. Continue 0.5 miles to North Creek. Go 2.6 miles, past the North Creek transect, to the Center Creek-Otter Lake intersection. Bear left and go 1.25 miles to a witness post on the left side of the road. Walk 60 paces west at 265 degrees to the 0-foot baseline stake, a short fencepost marked with a red browse tag.

**Site Information**

Land Ownership USFS  
 Allotment Coyote Hollow  
 Elevation 8,750ft (2,667m)  
 Aspect Southwest  
 Slope 3%  
 Sample Dates 08/06/1987, 08/12/1991, 07/28/1994, 08/05/1998, 08/18/2003, 08/12/2008, 07/17/2013

**DISTURBANCE HISTORY--**

Management unit 25C, Study no: 25

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	-	-	1984	-
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Crucial Winter

**VEGETATION HISTORY--**

Management unit 25C, Study no: 25

Year	Vegetation Type <sup>1</sup>
1985-1998	Perennial Grass/Low Rabbitbrush
2003-2013	Low Rabbitbrush/Mountain Big Sagebrush

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

Deer pellet groups were moderately abundant in 1991 (Jense, et al., Utah Big Game Annual Report, 1991). Elk, deer, and cattle pellet groups have varied from low abundance to moderate abundance since 1994 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 21 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

**SOIL ANALYSIS DATA--**

Management unit 25C, Study no: 25

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	48.4	31.1	20.6	6.1	0.4	2.7	15.3	249.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When the site was established in 1987, the site was comprised mainly of mountain low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *lanceolatus*) and a diverse community of introduced and native perennial grasses and forbs (Appendix - Pre-1992). Since 1998, the site has transitioned from a community dominated by low rabbitbrush and perennial grasses to one that is dominated by mountain big sagebrush (*Artemisia*



*tridentata* ssp. *vaseyana*) and low rabbitbrush. Perennial grasses and forbs have decreased slightly over the sample years. (Table - Browse Trends; Table - Herbaceous Trends). Without disturbance, sagebrush will likely continue to increase on the site and remain the dominant species on the site.

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 25C, Study no: 25

T y P e	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	<i>Agropyron cristatum</i>	<sub>b</sub> 145	<sub>b</sub> 182	<sub>b</sub> 135	<sub>b</sub> 164	<sub>a</sub> 21	3.22	5.21	2.17	2.30	.29
G	<i>Agropyron intermedium</i>	<sub>a</sub> 5	<sub>b</sub> 29	<sub>a</sub> 6	<sub>a</sub> 10	<sub>a</sub> 3	.03	.29	.06	.09	.00
G	<i>Agropyron spicatum</i>	<sub>ab</sub> 5	<sub>b</sub> 13	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.03	.24	-	-	-
G	<i>Bouteloua gracilis</i>	<sub>ab</sub> 29	<sub>a</sub> 17	<sub>b</sub> 52	<sub>ab</sub> 24	<sub>ab</sub> 19	1.58	.48	1.41	.63	.52
G	<i>Bromus anomalus</i>	-	-	-	-	4	-	-	-	-	.38
G	<i>Bromus inermis</i>	<sub>a</sub> 135	<sub>b</sub> 198	<sub>bc</sub> 236	<sub>c</sub> 255	<sub>bc</sub> 230	2.25	6.44	5.12	4.29	4.02
G	<i>Bromus japonicus</i> (a)	-	1	-	-	-	-	.03	-	-	-
G	<i>Carex</i> sp.	2	4	2	9	10	.03	.03	.00	.04	.19
G	<i>Festuca ovina</i>	6	8	-	-	-	.03	.09	-	-	-
G	<i>Koeleria cristata</i>	-	-	-	-	-	-	.03	-	-	-
G	<i>Poa fendleriana</i>	<sub>a</sub> 20	<sub>bc</sub> 142	<sub>b</sub> 113	<sub>c</sub> 162	<sub>b</sub> 111	.43	3.45	3.48	2.93	2.76
G	<i>Poa pratensis</i>	<sub>a</sub> 4	<sub>a</sub> 4	<sub>a</sub> 7	<sub>b</sub> 91	<sub>b</sub> 108	.15	.38	.30	1.44	2.97
G	<i>Poa secunda</i>	-	1	9	8	11	-	.03	.06	.04	.33
G	<i>Sitanion hystrix</i>	<sub>b</sub> 90	<sub>c</sub> 148	<sub>ab</sub> 73	<sub>a</sub> 44	<sub>ab</sub> 56	.56	3.11	1.02	.51	.40
G	<i>Stipa columbiana</i>	-	-	-	4	4	-	-	-	.03	.03
G	<i>Stipa comata</i>	<sub>a</sub> -	<sub>b</sub> 29	<sub>b</sub> 27	<sub>b</sub> 21	<sub>c</sub> 85	-	.38	.37	.22	1.87
G	<i>Stipa pinetorum</i>	<sub>b</sub> 318	<sub>a</sub> 191	<sub>a</sub> 174	<sub>a</sub> 178	<sub>a</sub> 140	11.32	4.17	2.74	2.80	3.17
Total for Annual Grasses		0	1	0	0	0	0	0.03	0	0	0
Total for Perennial Grasses		759	966	834	970	802	19.66	24.35	16.77	15.36	16.97
Total for Grasses		759	967	834	970	802	19.66	24.38	16.77	15.36	16.97
F	<i>Agoseris glauca</i>	-	3	1	-	-	-	.01	.03	-	-
F	<i>Alyssum alyssoides</i> (a)	-	1	-	-	-	-	.00	-	-	-
F	<i>Androsace septentrionalis</i> (a)	<sub>a</sub> 20	<sub>b</sub> 79	<sub>a</sub> 4	<sub>a</sub> 4	<sub>a</sub> 4	.07	.35	.01	.01	.01
F	<i>Antennaria parvifolia</i>	4	7	4	5	11	.03	.33	.07	.04	.22
F	<i>Arabis</i> sp.	-	3	2	2	7	-	.00	.00	.00	.02
F	<i>Astragalus convallarius</i>	<sub>ab</sub> 6	<sub>b</sub> 16	<sub>a</sub> -	<sub>ab</sub> 11	<sub>a</sub> -	.01	.22	-	.04	-
F	<i>Astragalus</i> sp.	-	1	-	-	-	-	.03	-	-	-
F	<i>Calochortus nuttallii</i>	4	-	3	-	-	.00	-	.00	-	-
F	<i>Castilleja linariaefolia</i>	2	14	7	7	12	.00	.10	.33	.07	.02
F	<i>Chaenactis douglasii</i>	<sub>b</sub> 23	<sub>b</sub> 19	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.05	.09	-	-	-
F	<i>Chenopodium album</i> (a)	5	3	3	3	1	.01	.03	.15	.00	.00
F	<i>Chenopodium leptophyllum</i> (a)	-	-	4	3	4	-	-	.01	.00	.01
F	<i>Collomia linearis</i> (a)	-	2	-	2	-	-	.00	-	.03	-
F	<i>Crepis acuminata</i>	-	4	-	-	-	-	.01	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	3	3	-	-	-	.00	.00	-	-
F	<i>Dracocephalum parviflorum</i>	-	-	2	-	-	-	-	.00	-	-
F	<i>Erigeron eatonii</i>	<sub>a</sub> -	<sub>b</sub> 29	<sub>b</sub> 15	<sub>c</sub> 48	<sub>b</sub> 26	-	.15	.08	.31	.13

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
F	<i>Erigeron flagellaris</i>	a-	ab10	a-	b8	ab9	-	.05	-	.05	.04
F	<i>Erigeron pumilus</i>	a39	a8	a32	b62	a24	.26	.09	.39	.37	.10
F	<i>Eriogonum cernuum</i> (a)	-	2	-	3	1	-	.01	-	.03	.00
F	<i>Eriogonum hookeri</i> (a)	b23	a-	a-	a-	a-	.09	-	-	-	-
F	<i>Eriogonum racemosum</i>	a92	ab118	ab112	b122	ab117	.77	2.04	1.76	1.20	.85
F	<i>Eriogonum umbellatum</i>	-	-	6	3	-	-	-	.01	.00	-
F	<i>Erodium cicutarium</i> (a)	1	-	-	-	-	.00	-	-	-	-
F	<i>Holosteum umbellatum</i> (a)	-	1	-	-	-	-	.00	-	-	-
F	<i>Ipomopsis aggregata</i>	6	6	-	1	-	.01	.18	-	.00	-
F	<i>Lappula occidentalis</i> (a)	-	2	6	1	5	-	.00	.01	.00	.00
F	<i>Lotus utahensis</i>	b102	b119	a43	b92	a47	.40	2.66	.36	.79	.19
F	<i>Lupinus sericeus</i>	ab32	b60	a18	ab26	ab35	1.29	5.44	2.32	1.36	.99
F	<i>Lychnis drummondii</i>	-	-	1	-	-	-	-	.00	-	-
F	<i>Machaeranthera canescens</i>	4	2	14	5	3	.03	.03	.19	.00	.00
F	<i>Microsteris gracilis</i> (a)	-	-	2	-	-	-	-	.01	-	-
F	<i>Oenothera</i> sp.	-	-	-	-	1	-	-	-	-	.00
F	<i>Orthocarpus</i> sp. (a)	-	-	-	3	-	-	-	-	.03	-
F	<i>Penstemon comarrhenus</i>	ab17	a5	b29	b31	b28	.09	.01	.48	.49	.17
F	<i>Phlox longifolia</i>	b35	a5	a2	b41	ab28	.08	.03	.01	.18	.07
F	<i>Polygonum douglasii</i> (a)	ab7	a-	ab3	b33	ab8	.01	-	.00	.08	.02
F	<i>Potentilla hippiana</i>	-	-	1	2	3	-	.00	.00	.00	.01
F	<i>Senecio multilobatus</i>	b22	a2	a7	ab10	a7	.05	.01	.04	.13	.01
F	<i>Taraxacum officinale</i>	b42	c77	a3	ab26	ab20	.07	.41	.15	.23	.10
F	<i>Tragopogon dubius</i> (a)	a-	ab7	b8	ab7	a-	-	.01	.02	.07	-
Total for Annual Forbs		56	100	33	59	23	0.19	0.42	0.23	0.26	0.05
Total for Perennial Forbs		430	508	302	502	378	3.20	11.96	6.30	5.31	2.97
Total for Forbs		486	608	335	561	401	3.39	12.39	6.53	5.57	3.03

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 25

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'94	'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata vaseyana</i>	1.42	1.50	7.36	6.05	9.80	12.33	12.64	12.63
B	<i>Chrysothamnus nauseosus</i>	.33	-	.24	.09	.03	.81	.80	.45
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	14.60	14.51	13.74	12.07	8.34	17.60	16.93	8.39
B	<i>Eriogonum microthecum</i>	-	-	-	-	.15	-	-	-
B	<i>Symphoricarpos oreophilus</i>	.41	.76	.15	.18	.18	.15	-	-
B	<i>Tetradymia canescens</i>	1.01	.69	.18	.06	.03	.61	.55	.10
Total for Browse		17.79	17.47	21.68	18.46	18.54	31.5	30.92	21.57

**BASIC COVER--**

Management unit 25C, Study no: 25

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	36.82	54.06	43.32	48.18	39.34
Rock	1.92	.29	1.07	.45	.20
Pavement	24.34	32.76	44.06	31.81	26.45
Litter	29.96	41.45	20.54	27.86	36.67
Cryptogams	0	.01	.04	.10	.03
Bare Ground	8.61	4.53	3.86	4.83	17.26

**PELLET GROUP DATA--**

Management unit 25C, Study no: 25

Type	Quadrat Frequency					Days use per acre (ha)			
	'94	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	12	14	12	50	2	-	-	-	-
Elk	12	5	6	31	19	6 (15)	12 (30)	32 (79)	28 (69)
Deer	29	25	8	33	10	36 (89)	25 (61)	19 (48)	15 (36)
Cattle	1	8	17	17	7	33 (82)	27 (66)	17 (41)	21 (52)

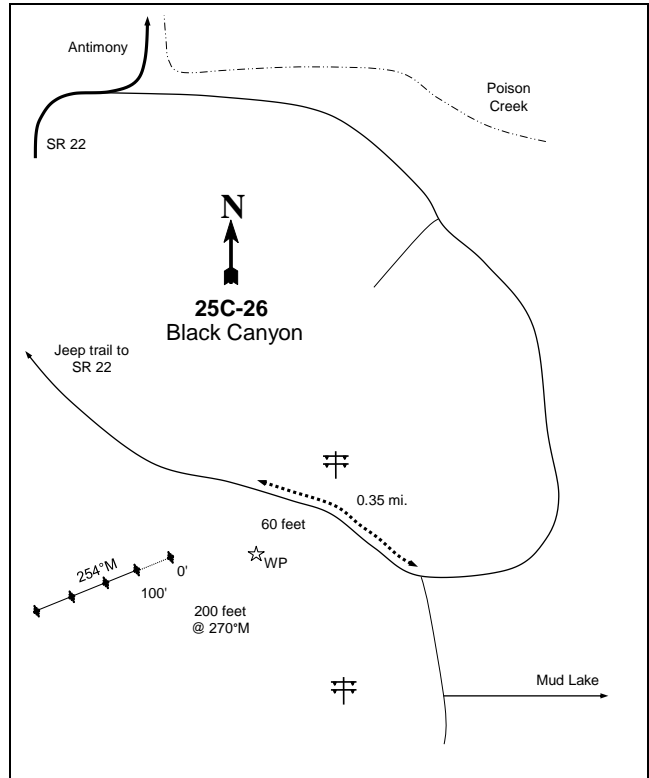
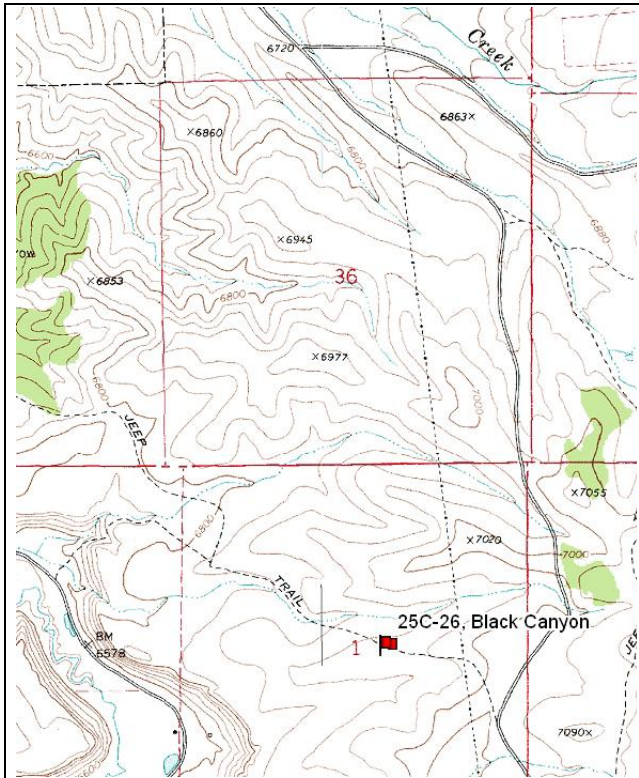
**BROWSE CHARACTERISTICS--**

Management unit 25C, Study no: 25

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia tridentata vaseyana</b>									
94	<b>1380</b>	17	80	3	540	9	0	0	33/45
98	<b>1420</b>	32	66	1	240	13	0	0	19/29
03	<b>2620</b>	16	80	4	-	11	0	.76	18/27
08	<b>5980</b>	62	30	8	4160	19	2	1	19/34
13	<b>6840</b>	51	46	3	980	35	15	6	16/29
<b>Chrysothamnus nauseosus</b>									
94	<b>740</b>	41	54	5	20	8	0	3	50/47
98	<b>180</b>	22	67	11	-	0	0	11	30/22
03	<b>340</b>	6	76	18	-	24	0	0	29/26
08	<b>320</b>	0	56	44	-	6	0	31	23/26
13	<b>120</b>	0	83	17	-	17	0	17	28/29
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
94	<b>25460</b>	77	18	5	480	.23	1	.31	49/55
98	<b>12360</b>	48	49	3	860	.32	.97	5	20/24
03	<b>18080</b>	21	75	3	20	1	0	.33	12/15
08	<b>22300</b>	20	51	30	820	13	0	4	11/15
13	<b>13240</b>	27	73	0	220	28	9	10	9/12

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Leptodactylon pungens</b>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	15/17	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<b>Symphoricarpos oreophilus</b>										
94	<b>60</b>	33	67	-	-	0	0	0	17/43	
98	<b>60</b>	33	67	-	-	0	0	0	22/74	
03	<b>40</b>	50	50	-	-	0	0	0	22/70	
08	<b>40</b>	100	0	-	-	0	0	0	16/37	
13	<b>100</b>	0	100	-	-	80	0	80	13/45	
<b>Tetradymia canescens</b>										
94	<b>640</b>	28	69	3	-	6	6	0	34/41	
98	<b>400</b>	5	80	15	-	20	0	5	16/22	
03	<b>340</b>	0	71	29	-	0	0	12	11/15	
08	<b>280</b>	14	36	50	-	14	0	21	11/15	
13	<b>120</b>	0	100	0	-	50	17	17	11/14	

BLACK CANYON - TREND STUDY NO. 25C-26



**Location Information**

USGS 7.5 min Map Info      Antimony; Township 32S, Range 2W, Section 01  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 416109 East 4211914 North

**Transect Information**

Browse Tag # (0' Stake)      Not Available  
 Transect Bearing              254° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement      Standard

**Directions to Site**

From Antimony, travel south on SR 22 to the turnoff to Mud Lake road. Turn east, go along Poison Creek for 1.2 miles to a fork, stay right. Continue southeast for 2.2 miles to another major fork. At this point there is a faint jeep trail heading back to the north. Follow this jeep trail 0.35 miles, under the powerlines and up on the ridge to a green fence post (witness post) about 20 yards off the south side (left) of the road. The transect starts 200 feet west of the witness post. It is marked by 1.5 foot tall fenceposts.

**Site Information**

Land Ownership BLM  
 Allotment Poison Creek  
 Elevation 6,960ft (2,121m)  
 Aspect West  
 Slope 5%  
 Sample Dates 08/04/1987, 08/24/1991, 08/19/1998, 07/31/2003, 08/13/2008, 07/16/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter; Pronghorn, Crucial Winter; Sage-Grouse, Habitat Winter

VEGETATION HISTORY--

Management unit 25C, Study no: 26

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Wyoming Big Sagebrush/Black Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Due to hybridization, there has been some difficulty distinguishing between Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and black sagebrush (*Artemisia nova*) in the sample years, particularly in 2008. Owing to the difficulty of differentiating between deer and pronghorn pellet groups, pronghorn pellet groups were counted with the deer pellet group data (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 9 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Aridic Calciborolls  
 NRCS Ecological Site [Semidesert Gravelly Loam \(Black Sagebrush\)](#)  
 NRCS Ecological Site # R047XB210UT

SOIL ANALYSIS DATA--

Management unit 25C, Study no: 26

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	62.0	19.4	26.6	7.1	0.4	1.8	3.5	134.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1987, the site was a mixed stand of Wyoming big sagebrush and black sagebrush with a nearly homogeneous understory mainly comprised of blue grama (*Bouteloua gracilis*). Over the duration of the study, the site has generally remained as a community dominated by Wyoming big sagebrush and black sagebrush, while blue grama maintained its dominance within the herbaceous understory (Table - Browse Trends; Table - Herbaceous Trends) Due to hybridization of the two sagebrush species, it should be noted that shifts between these two populations is likely negligible.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
 Management unit 25C, study no: 26

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	14.7	11.7	5.8	25.3	0.0	1.3	0.0	<b>58.7</b>	Good
2003	19.5	4.5	0.0	28.1	0.0	0.0	0.0	<b>52.1</b>	Good
2008	21.6	5.6	1.7	30.0	0.0	0.1	0.0	<b>59.0</b>	Good
2013	21.0	9.9	2.0	20.0	0.0	0.2	0.0	<b>53.0</b>	Good

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 26

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Bouteloua gracilis</i>	<sub>b</sub> 291	<sub>ab</sub> 280	<sub>ab</sub> 283	<sub>a</sub> 256	12.51	13.68	17.22	9.22
G	<i>Sitanion hystrix</i>	11	4	8	17	.06	.06	.16	.05
G	<i>Sporobolus cryptandrus</i>	4	-	1	1	.03	-	.03	.03
G	<i>Stipa comata</i>	<sub>a</sub> 9	<sub>a</sub> 15	<sub>ab</sub> 29	<sub>b</sub> 42	.04	.28	.76	.71
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		315	299	321	316	12.65	14.03	18.19	10.02
Total for Grasses		315	299	321	316	12.65	14.03	18.19	10.02
F	<i>Astragalus calycosus</i>	-	-	-	3	-	-	-	.01
F	<i>Astragalus purshii</i>	-	-	-	4	-	-	-	.01
F	<i>Astragalus</i> sp.	<sub>b</sub> 26	<sub>a</sub> -	<sub>ab</sub> 1	<sub>a</sub> -	.48	-	.03	-
F	<i>Chenopodium</i> sp. (a)	4	5	-	2	.01	.00	-	.01
F	<i>Descurainia pinnata</i> (a)	-	3	-	-	-	.00	-	-
F	<i>Draba</i> sp. (a)	1	-	-	-	.00	-	-	-
F	<i>Erigeron pumilus</i>	<sub>c</sub> 22	<sub>a</sub> -	<sub>ab</sub> 1	<sub>b</sub> 12	.15	-	.00	.05
F	<i>Lesquerella</i> sp.	-	2	-	-	-	.00	-	-
F	<i>Machaeranthera canescens</i>	-	1	-	-	-	.00	-	-
F	<i>Phlox longifolia</i>	5	1	4	6	.01	.00	.01	.03
Total for Annual Forbs		5	8	0	2	0.01	0.01	0	0.01
Total for Perennial Forbs		53	4	6	25	0.65	0.01	0.04	0.10
Total for Forbs		58	12	6	27	0.66	0.02	0.04	0.11

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

BROWSE TRENDS--

Management unit 25C, Study no: 26

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	6.09	10.05	16.56	14.19	7.10	22.40	13.63
B	Artemisia tridentata wyomingensis	5.60	5.55	.68	2.56	7.71	.86	9.21
B	Chrysothamnus viscidiflorus stenophyllus	.14	.90	.69	1.12	.88	1.06	1.53
B	Ephedra nevadensis	.03	.03	.03	.03	-	-	-
B	Gutierrezia sarothrae	.17	.41	.20	.74	.33	.20	.60
B	Opuntia sp.	.03	.03	.18	.30	-	.03	-
B	Pediocactus simpsonii	.00	-	.00	-	-	-	-
Total for Browse		12.07	16.98	18.36	18.95	16.02	24.55	24.97

BASIC COVER--

Management unit 25C, Study no: 26

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	28.67	30.86	39.18	28.74
Rock	7.03	7.77	9.67	12.45
Pavement	34.30	32.42	36.64	30.19
Litter	21.10	21.11	21.23	22.17
Cryptogams	.59	.46	.13	.30
Bare Ground	11.04	16.04	5.08	17.29

PELLET GROUP DATA--

Management unit 25C, Study no: 26

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	13	2	42	4	-	-	-	-
Elk	2	-	-	-	6 (15)	-	-	-
Deer/ Pronghorn	21	7	12	22	37 (91)	15 (38)	20 (50)	54 (134)
Cattle	1	-	1	1	6 (15)	4 (9)	2 (4)	5 (13)

BROWSE CHARACTERISTICS--

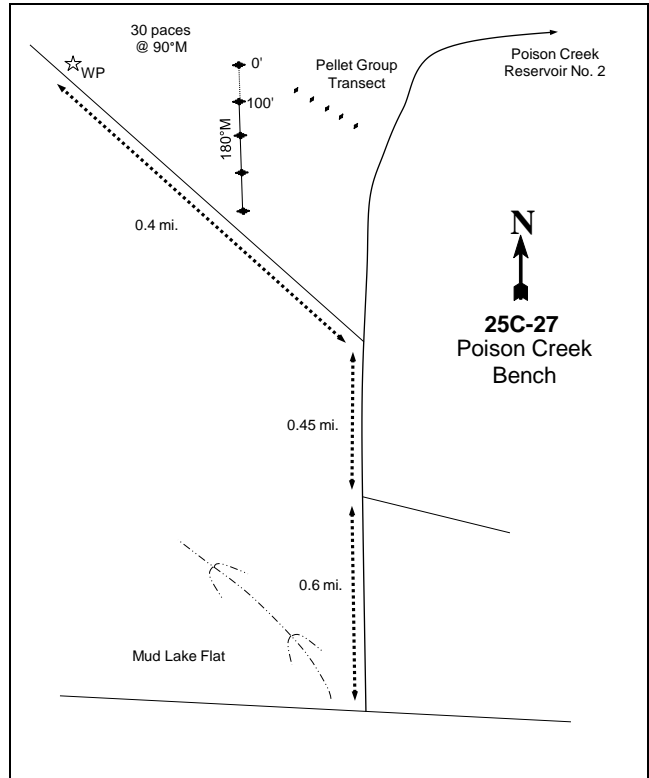
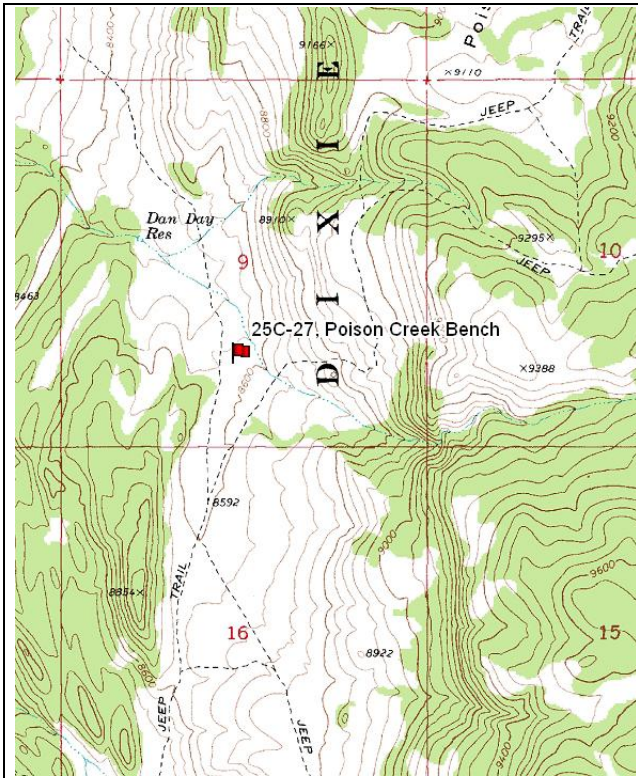
Management unit 25C, Study no: 26

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Artemisia nova									
98	<b>2800</b>	9	77	14	140	14	.71	7	10/21
03	<b>6060</b>	0	71	29	-	8	.33	14	7/15
08	<b>6920</b>	3	65	32	20	20	0	25	9/22
13	<b>4640</b>	3	80	17	-	41	50	14	8/21



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>									
98	<b>3720</b>	14	78	8	180	32	4	5	11/22
03	<b>1520</b>	0	54	46	-	21	0	20	16/33
08	<b>220</b>	9	73	18	-	0	0	0	18/40
13	<b>1320</b>	8	74	18	-	30	55	26	12/29
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
98	<b>980</b>	20	55	24	120	0	0	12	8/15
03	<b>1160</b>	0	74	26	-	0	0	5	7/12
08	<b>820</b>	5	59	37	20	5	0	27	7/12
13	<b>980</b>	14	86	0	60	51	6	57	6/13
<i>Ephedra nevadensis</i>									
98	<b>20</b>	100	0	-	-	0	0	0	12/14
03	<b>20</b>	0	100	-	-	0	0	0	15/10
08	<b>20</b>	100	0	-	-	0	0	0	15/12
13	<b>60</b>	100	0	-	-	100	0	0	8/6
<i>Ephedra viridis</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	19/19
<i>Gutierrezia sarothrae</i>									
98	<b>360</b>	39	56	6	200	0	0	0	8/10
03	<b>760</b>	0	95	5	-	0	0	0	7/8
08	<b>580</b>	24	62	14	60	0	0	10	7/9
13	<b>2220</b>	26	74	0	-	0	.90	0	6/7
<i>Opuntia sp.</i>									
98	<b>60</b>	33	67	-	-	0	0	0	4/12
03	<b>80</b>	0	100	-	-	0	0	0	5/14
08	<b>100</b>	0	100	-	-	0	0	0	5/13
13	<b>100</b>	0	100	-	-	0	0	20	5/13
<i>Pediocactus simpsonii</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	1/3
13	<b>0</b>	0	0	-	-	0	0	0	-/-

POISON CREEK BENCH - TREND STUDY NO. 25C-27



**Location Information**

USGS 7.5 min Map Info      Antimony; Township 32S, Range 1W, Section 09  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 420601 East 4209993 North

**Transect Information**

Browse Tag # (0' Stake)      9001  
 Transect Bearing              180° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
 Belt Marker Placement        Belt 3: 2ft

**Directions to Site**

From the Center Creek study site (25C-25), continue north on the main road for 2.3 miles to the Mud Lake/Pacer Lake fork. Continue straight on the main road for 0.4 miles to a fork near an intermittent stream and turn right. This area can also be reached by coming from the north along the Poison Creek and Mud Lake roads. Drive 0.6 miles to a fork. Proceed straight through the fork for 0.45 miles to another fork. Bear left and proceed 0.4 miles to the study site, identified by a witness post on the right side of the road. The 0-foot baseline stake is about 30 paces east of the witness post. Attached to the 2-foot metal fencepost is the browse tag, #9001.

**Site Information**

Land Ownership USFS  
 Allotment Coyote Hollow  
 Elevation 8,580ft (2,615m)  
 Aspect Northwest  
 Slope 1-2%  
 Sample Dates 08/06/1987, 08/21/1991, 08/28/1994, 08/05/1998, 07/31/2003, 08/13/2008, 07/17/2013

**DISTURBANCE HISTORY--**

Management unit 25C, Study no: 27

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire (Prescribed)	-	-	1994	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter

**VEGETATION HISTORY--**

Management unit 25C, Study no: 27

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1994	Mountain Big Sagebrush	Phase I
1998	Perennial Grass-Forb	Phase I
2003-2008	Mountain Big Sagebrush/Low Rabbitbrush	Phase I
2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The study is situated on high elevation winter range on the west side of the unit, and is likely used more by big game as transitional and summer range. In 2013, nearly all the grasses were heavily grazed with some moderate use on silvery lupine (*Lupinus argenteus*).

**Site Potential**

1981-2010 Average Annual Precipitation 20 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Gravelly Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB406UT

**SOIL ANALYSIS DATA--**

Management unit 25C, Study no: 27

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	54.0	27.4	18.6	6.0	0.5	5.4	35.2	313.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Gravelly Loam \(Mountain Big Sagebrush\), R047XA406UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1987, the site was a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*). The herbaceous understory was comprised mainly of the perennial grass species needleleaf sedge (*Carex eleocharis*) bottlebrush squirreltail (*Sitanion hystrix*) and

Letterman's needlegrass (*Stipa lettermani*) with a diverse forb component (Appendix - Pre-1992) (Table - Browse Trends; Table - Herbaceous Trends). Due to the prescribed burn in 1998, the majority of the browse species were removed and the site transitioned to a perennial grass and forb community. Since 1998, mountain big sagebrush and low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) have gradually increased on the site. Since the fire in 1994, the site has transitioned back to a mountain big sagebrush community. Additionally, perennial grasses have maintained dominance within the understory, while perennial forbs have steadily decreased in abundance (Table - Browse Trends; Table - Herbaceous Trends).

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 7, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	14.7	11.7	5.8	25.3	0.0	1.3	0.0	<b>58.7</b>	Good
1998	19.5	4.5	0.0	28.1	0.0	0.0	0.0	<b>52.1</b>	Good
2003	21.6	5.6	1.7	30.0	0.0	0.1	0.0	<b>59.0</b>	Good
2008	21.0	9.9	2.0	20.0	0.0	0.2	0.0	<b>53.0</b>	Good
2013	21.0	3.6	2.5	3.8	0.0	2.8	0.0	<b>33.7</b>	Fair

**Trend Summary**

HERBACEOUS TRENDS--  
Management unit 25C, Study no: 27

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
G	Agropyron cristatum	-	4	-	-	2	-	.03	-	-	.00
G	Agropyron intermedium	-	1	-	-	2	-	.00	-	-	.03
G	Agropyron smithii	a-	b-	a-	b32	ab3	-	-	-	.13	.01
G	Agropyron spicatum	-	-	9	3	-	-	-	.04	.00	-
G	Bouteloua gracilis	ab39	a35	ab48	b58	ab49	1.07	1.01	2.07	1.52	1.59
G	Bromus anomalus	-	-	2	-	-	-	-	.00	-	-
G	Bromus japonicus (a)	-	-	-	-	-	-	.00	-	-	-
G	Carex eleocharis	a-	a-	a-	a-	b226	-	-	-	-	5.65
G	Carex geyeri	-	-	-	-	9	-	-	-	-	.45
G	Carex sp.	b151	c210	c223	c226	a-	2.08	11.49	12.11	10.14	-
G	Koeleria cristata	b15	ab5	a-	ab7	a-	.10	.06	-	.04	-
G	Poa fendleriana	c88	bc60	ab32	b44	a10	2.15	1.56	.38	.54	.06
G	Poa pratensis	-	-	-	4	-	-	-	-	.03	-
G	Poa secunda	-	-	1	3	-	-	-	.00	.00	-
G	Sitanion hystrix	a80	ab105	b143	ab103	a82	.78	2.99	3.66	1.13	.85
G	Stipa columbiana	a-	b25	ab3	a-	ab6	-	.95	.03	-	.01
G	Stipa comata	a8	b63	b97	c143	c176	.36	2.41	3.59	4.28	3.46
G	Stipa lettermani	ab117	a88	ab92	b143	ab116	3.65	2.75	2.70	3.74	2.57
Total for Annual Grasses		0	0	0	0	0	0	0.00	0	0	0
Total for Perennial Grasses		498	596	650	766	681	10.21	23.27	24.62	21.59	14.70
Total for Grasses		498	596	650	766	681	10.21	23.28	24.62	21.59	14.70
F	Agoseris glauca	-	-	12	-	4	-	-	.07	-	.01

Type	Species	Nested Frequency					Average Cover %				
		'94	'98	'03	'08	'13	'94	'98	'03	'08	'13
F	<i>Androsace septentrionalis</i> (a)	a <sup>3</sup>	b <sup>32</sup>	a <sup>8</sup>	a <sup>2</sup>	a <sup>5</sup>	.01	.28	.01	.00	.01
F	<i>Antennaria parvifolia</i>	-	6	-	5	3	-	.06	-	.03	.15
F	<i>Arabis demissa</i>	b <sup>11</sup>	b <sup>16</sup>	ab <sup>2</sup>	ab <sup>6</sup>	a <sup>-</sup>	.02	.08	.01	.04	-
F	<i>Artemisia ludoviciana</i>	1	1	3	4	4	.00	.03	.38	.15	.03
F	<i>Astragalus convallarius</i>	ab <sup>10</sup>	b <sup>17</sup>	ab <sup>5</sup>	ab <sup>7</sup>	a <sup>3</sup>	.10	.24	.24	.10	.01
F	<i>Astragalus</i> sp.	5	-	-	-	-	.01	-	-	-	-
F	<i>Castilleja linariaefolia</i>	bc <sup>26</sup>	c <sup>36</sup>	a <sup>4</sup>	ab <sup>7</sup>	bc <sup>29</sup>	.32	1.11	.06	.19	.22
F	<i>Chaenactis douglasii</i>	ab <sup>2</sup>	b <sup>11</sup>	ab <sup>3</sup>	a <sup>-</sup>	ab <sup>8</sup>	.01	.07	.03	-	.01
F	<i>Chenopodium leptophyllum</i> (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>19</sup>	ab <sup>3</sup>	b <sup>21</sup>	-	-	.21	.00	.05
F	<i>Crepis acuminata</i>	-	5	-	-	-	-	.04	.00	-	-
F	<i>Cryptantha flavoculata</i>	5	-	-	1	8	.01	-	-	.00	.04
F	<i>Descurainia pinnata</i> (a)	-	9	1	1	-	-	.04	.00	.00	-
F	<i>Epilobium brachycarpum</i> (a)	-	-	-	-	7	-	-	-	-	.01
F	<i>Erigeron eatonii</i>	a <sup>11</sup>	a <sup>28</sup>	a <sup>15</sup>	a <sup>23</sup>	b <sup>52</sup>	.05	.49	.06	.24	.37
F	<i>Erigeron pumilus</i>	17	22	39	31	36	.14	.43	.42	.24	.29
F	<i>Eriogonum racemosum</i>	39	41	55	57	55	.21	.72	.93	.66	.63
F	<i>Eriogonum umbellatum</i>	bc <sup>31</sup>	a <sup>12</sup>	ab <sup>14</sup>	abc <sup>18</sup>	c <sup>34</sup>	.25	.58	.45	.44	1.09
F	<i>Gayophytum ramosissimum</i> (a)	a <sup>-</sup>	a <sup>-</sup>	c <sup>28</sup>	a <sup>-</sup>	b <sup>17</sup>	-	-	.12	-	.03
F	<i>Gilia</i> sp. (a)	6	-	-	-	-	.01	-	-	-	-
F	<i>Hymenoxys richardsonii</i>	3	3	3	2	-	.03	.15	.18	.18	-
F	<i>Ipomopsis aggregata</i>	5	8	-	2	3	.02	.36	-	.00	.00
F	<i>Lappula occidentalis</i> (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>15</sup>	ab <sup>3</sup>	ab <sup>2</sup>	-	-	.40	.00	.00
F	<i>Linum lewisii</i>	2	3	-	-	1	.00	.04	-	-	.00
F	<i>Lotus utahensis</i>	c <sup>66</sup>	bc <sup>35</sup>	a <sup>8</sup>	ab <sup>25</sup>	ab <sup>21</sup>	.22	1.35	.22	.22	.16
F	<i>Lupinus argenteus</i>	b <sup>81</sup>	b <sup>66</sup>	a <sup>28</sup>	a <sup>13</sup>	a <sup>6</sup>	1.46	6.76	1.33	.14	.19
F	<i>Lychnis drummondii</i>	-	10	-	-	-	-	.06	-	-	-
F	<i>Lygodesmia spinosa</i>	2	6	4	4	1	.06	.09	.18	.06	.00
F	<i>Machaeranthera canescens</i>	ab <sup>7</sup>	ab <sup>1</sup>	ab <sup>4</sup>	b <sup>17</sup>	a <sup>-</sup>	.07	.03	.03	.08	-
F	<i>Microsteris gracilis</i> (a)	-	2	5	-	-	-	.03	.01	-	-
F	<i>Oenothera pallida</i>	-	-	1	4	-	-	-	.03	.00	-
F	<i>Orthocarpus luteus</i> (a)	3	-	1	1	-	.00	-	.03	.03	-
F	<i>Penstemon comarrhenus</i>	a <sup>3</sup>	ab <sup>18</sup>	ab <sup>5</sup>	b <sup>17</sup>	a <sup>1</sup>	.00	.05	.07	.12	.00
F	<i>Petradoria pumila</i>	2	1	1	-	4	.03	.00	.00	-	.06
F	<i>Phlox longifolia</i>	17	12	18	23	16	.04	.06	.11	.14	.07
F	<i>Polygonum douglasii</i> (a)	-	-	-	-	1	-	-	-	-	.00
F	<i>Potentilla hippiana</i>	ab <sup>2</sup>	a <sup>1</sup>	ab <sup>3</sup>	ab <sup>3</sup>	b <sup>8</sup>	.03	.01	.03	.03	.18
F	<i>Senecio multilobatus</i>	a <sup>16</sup>	b <sup>79</sup>	a <sup>14</sup>	a <sup>5</sup>	a <sup>17</sup>	.04	2.23	.06	.07	.15
F	<i>Taraxacum officinale</i>	-	5	1	1	-	-	.05	.00	.01	-
F	<i>Tragopogon dubius</i> (a)	-	-	-	-	-	-	-	.01	-	-
F	<i>Veronica biloba</i> (a)	-	3	-	-	-	-	.15	-	-	-
Total for Annual Forbs		12	46	77	10	53	0.02	0.50	0.82	0.05	0.12
Total for Perennial Forbs		364	443	242	275	314	3.19	15.14	4.96	3.19	3.72
Total for Forbs		376	489	319	285	367	3.22	15.64	5.78	3.24	3.85

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

BROWSE TRENDS--

Management unit 25C, Study no: 27

Type	Species	Quadrat Cover %					Line Intercept Cover%		
		'94	'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	1.84	-	-	-	.03	-	-	-
B	Artemisia tridentata vaseyana	20.42	2.53	7.54	11.13	21.01	8.53	13.15	19.30
B	Chrysothamnus parryi	.20	-	1.02	1.40	1.15	1.73	2.03	.70
B	Chrysothamnus viscidiflorus viscidiflorus	.46	2.99	7.39	6.69	5.87	7.36	6.78	4.75
B	Gutierrezia sarothrae	-	.01	.18	.57	-	.06	.85	-
B	Juniperus scopulorum	.15	-	-	-	-	-	-	-
B	Leptodactylon pungens	.36	.00	.01	-	-	-	.06	.05
B	Opuntia sp.	.05	-	-	-	-	-	-	-
B	Pediocactus simpsonii	-	.03	-	.03	.04	-	-	-
B	Purshia tridentata	8.53	.18	.15	.45	.71	.75	1.48	1.61
B	Tetradymia canescens	.00	.00	.15	.15	.15	-	-	-
Total for Browse		32.02	5.76	16.45	20.43	28.97	18.43	24.35	26.41

BASIC COVER--

Management unit 25C, Study no: 27

Cover Type	Average Cover %				
	'94	'98	'03	'08	'13
Vegetation	42.77	51.95	49.55	51.96	41.71
Rock	18.45	9.80	13.75	10.92	20.12
Pavement	3.72	21.65	20.04	20.46	13.46
Litter	43.79	30.39	22.11	31.96	33.75
Cryptogams	.12	.01	.00	.00	.29
Bare Ground	8.99	13.82	10.18	7.01	7.82

PELLET GROUP DATA--

Management unit 25C, Study no: 27

Type	Quadrat Frequency				
	'94	'98	'03	'08	'13
Rabbit	21	9	3	80	14
Elk	-	1	2	5	-
Deer	30	19	8	17	8
Cattle	5	3	15	19	12

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
1 (2)	8 (20)	3 (7)	2 (5)
11 (27)	17 (41)	12 (30)	7 (17)
11 (27)	33 (81)	36 (90)	14 (34)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 27

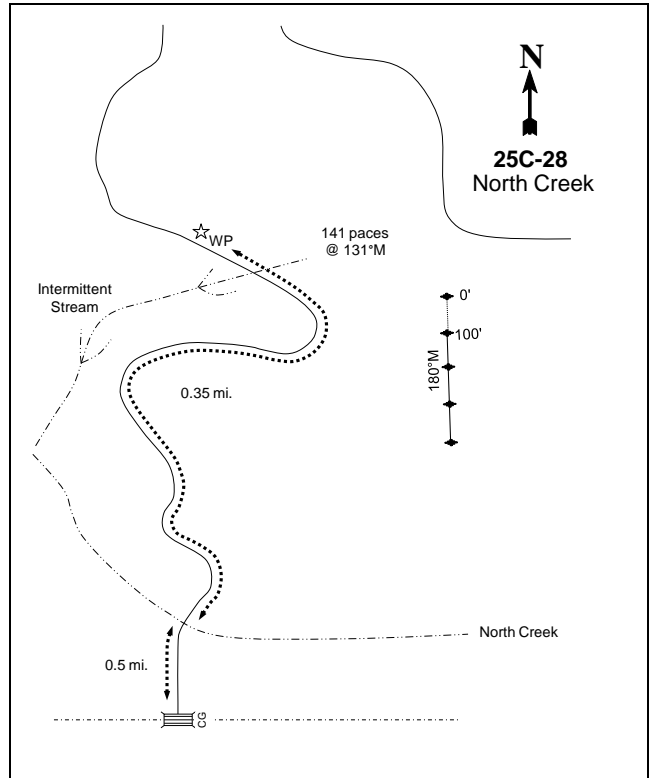
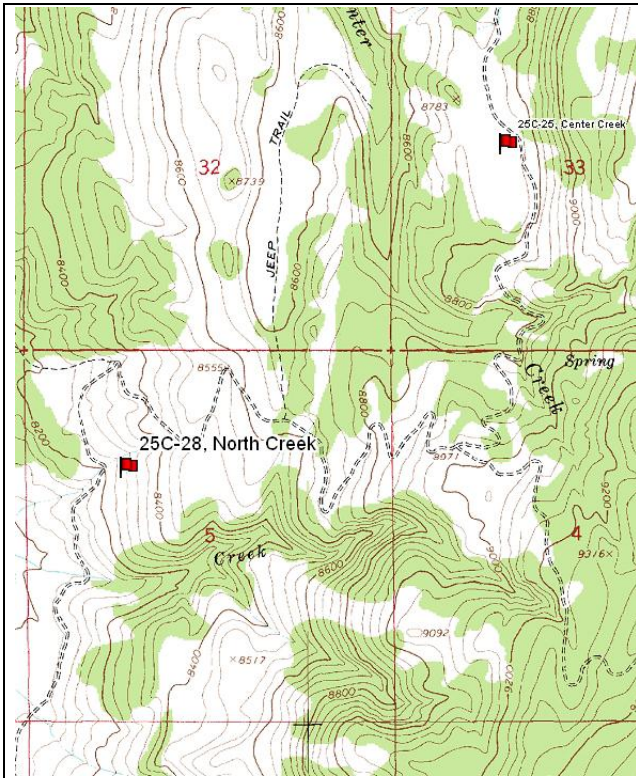
		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia nova</i>										
94	520	0	54	46	-	23	0	42	6/18	
98	0	0	0	0	-	0	0	0	-/-	
03	20	0	100	0	-	100	0	0	-/-	
08	20	0	100	0	-	100	0	0	10/19	
13	20	0	100	0	-	0	0	0	12/18	
<i>Artemisia tridentata vaseyana</i>										
94	6760	17	62	21	1720	22	2	5	24/34	
98	1280	36	41	23	480	20	0	3	15/23	
03	2460	2	89	8	-	15	0	2	18/28	
08	9500	75	22	3	4500	8	0	3	18/28	
13	8260	38	62	0	1260	29	12	5	15/27	
<i>Ceanothus fendleri</i>										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	8/24	
13	40	0	100	-	-	0	0	0	10/24	
<i>Cercocarpus ledifolius</i>										
94	0	0	0	-	-	0	0	0	-/-	
98	40	100	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus nauseosus</i>										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	40	50	50	-	-	0	0	0	10/17	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus parryi</i>										
94	740	3	97	0	20	19	14	0	8/5	
98	0	0	0	0	-	0	0	0	-/-	
03	1180	0	98	2	-	5	2	0	8/9	
08	1100	9	65	25	-	5	2	5	11/15	
13	780	5	95	0	-	0	8	0	8/12	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
94	1920	7	90	3	-	6	8	0	12/13	
98	2520	20	79	2	60	0	0	.79	13/16	
03	2260	1	98	1	-	.88	0	0	15/22	
08	2880	6	50	44	360	6	2	30	14/23	
13	3040	6	89	5	-	26	3	10	14/21	
<i>Gutierrezia sarothrae</i>										
94	120	0	100	0	-	0	0	0	8/7	
98	200	40	60	0	60	0	0	0	8/9	
03	520	0	100	0	20	0	0	0	5/4	
08	880	0	64	36	-	0	0	18	7/10	
13	20	0	100	0	-	0	0	0	7/8	
<i>Juniperus osteosperma</i>										
94	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
94	740	0	100	0	-	0	0	0	5/8	
98	80	0	0	100	-	0	0	0	9/11	
03	360	0	100	0	-	0	0	0	5/7	
08	440	0	23	77	-	0	0	14	4/10	
13	280	0	100	0	-	0	0	0	4/8	
<i>Opuntia sp.</i>										
94	80	0	100	-	-	0	0	0	2/60	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Pediocactus simpsonii</i>										
94	0	0	0	0	-	0	0	0	-/-	
98	240	25	75	0	-	0	0	0	2/3	
03	20	0	100	0	-	0	0	0	1/3	
08	60	33	33	33	-	0	0	33	2/3	
13	40	50	50	0	-	0	0	0	2/2	
<i>Purshia tridentata</i>										
94	920	11	46	43	40	50	9	0	28/59	
98	40	100	0	0	20	0	0	0	29/47	
03	120	0	83	17	-	33	50	0	18/28	
08	120	33	0	67	-	0	67	0	24/47	
13	100	20	80	0	20	40	40	0	22/53	



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Rosa woodsii</i>										
94	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	9/10	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Symphoricarpos oreophilus</i>										
94	<b>20</b>	0	100	-	-	0	0	0	10/11	
98	<b>0</b>	0	0	-	-	0	0	0	13/36	
03	<b>0</b>	0	0	-	-	0	0	0	15/27	
08	<b>0</b>	0	0	-	-	0	0	0	18/46	
13	<b>0</b>	0	0	-	-	0	0	0	18/54	
<i>Tetradymia canescens</i>										
94	<b>60</b>	33	67	0	-	0	0	0	3/2	
98	<b>140</b>	57	43	0	-	0	0	0	11/12	
03	<b>40</b>	0	100	0	-	100	0	0	13/17	
08	<b>80</b>	0	0	100	-	0	0	50	11/13	
13	<b>40</b>	0	50	50	-	0	50	50	-/-	

NORTH CREEK - TREND STUDY NO. 25C-28



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Grass Lakes; Township 33S, Range 1W, Section 05  
NAD 83, UTM Zone 12, 418600 East 4202672 North

**Transect Information**

Browse Tag # (0' Stake)	7168
Transect Bearing	180° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)
Belt Marker Placement	Standard

**Directions to Site**

At the intersection of SR 12 and route 1660 (to 22), turn left onto Johns Flat Road. Drive 17.2 miles north to Grass Lake road (USFS sign) and turn east. Travel 1.2 miles on this road to a fork by hayfields. Turn right and continue 0.4 miles to the Horse Creek fork. Turn left and proceed 1.15 miles to a signed fork. Stay left and continue 0.25 miles on the main road. Pass the buildings at Birch Creek, take the right fork and go 0.6 miles. Stay left at the fork and go 0.75 miles to a cattleguard. Continue 0.75 miles to a fork. Stay left and go 1.65 miles to a U.S. Forest Service enclosure. Continue 2.55 miles to a cattleguard. Continue 0.5 miles to North Creek. Cross and go 0.35 miles, over an intermittent stream and partway up a hill to a witness post on the right. The transect is 80 paces bearing 118 degrees magnetic up on a hillside. The 0-foot baseline stake is tagged #7168.

### Site Information

Land Ownership USFS  
 Allotment Coyote Hollow  
 Elevation 8,230ft (2,509m)  
 Aspect West  
 Slope 10-23%  
 Sample Dates 08/04/1987, 08/12/1991, 08/05/1998, 08/18/2003, 08/12/2008, 07/17/2013

### DISTURBANCE HISTORY--

Management unit 25C, Study no: 28

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Wildfire	-	-	2002	-

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter; Elk, Crucial Winter

### VEGETATION HISTORY--

Management unit 25C, Study no: 28

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1998	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2003-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

The study is situated on high elevation winter range on the west side of the unit, and is likely used more by big game as transitional and summer range.

### Site Potential

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

### SOIL ANALYSIS DATA--

Management unit 25C, Study no: 28

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	46.0	29.4	24.6	6.1	0.4	2.7	8.3	211.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

When the site was established in 1987, there was a mixed stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) with a limited understory of perennial grasses and forbs. Few introduced perennial grass species have been found on the site since establishment. Additionally, rocky mountain juniper (*Juniperus scopulorum*) and pinyon pine (*Pinus edulis*) were encroaching on the site (Appendix - Pre-1992) (Table - Herbaceous Trends). Due to the fire in 2002, mountain big sagebrush was nearly removed leaving the perennial grass and forb communities as the major component. Since 2003, mountain big sagebrush has steadily increased in frequency and cover to become the dominant species on the site (Table - Browse Trends; Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 25C, study no: 27

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	6.7	6.3	4.5	3.9	-0.2	10.0	0.0	<b>31.2</b>	Very Poor
2003	8.9	8.9	10.4	14.5	-0.3	5.5	0.0	<b>48.0</b>	Poor
2008	14.9	14.4	15.0	13.6	-0.9	10.0	0.0	<b>67.0</b>	Fair-Good
2013	24.4	1.7	7.6	2.3	0.0	1.6	0.0	<b>37.6</b>	Poor

## HERBACEOUS TRENDS--

Management unit 25C, Study no: 28

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	ab1	a-	b10	a-	.01	-	.04	-
G	Agropyron spicatum	-	1	3	10	-	.03	.15	.09
G	Bouteloua gracilis	a2	a2	b7	a2	.15	.15	.06	.38
G	Bromus inermis	4	-	-	3	.01	-	-	.03
G	Bromus tectorum (a)	a2	a16	b77	c139	.00	.21	.37	1.22
G	Oryzopsis hymenoides	ab1	a-	b5	a-	.00	-	.06	-
G	Poa fendleriana	2	3	1	5	.01	.15	.03	.06
G	Poa secunda	-	-	-	-	-	.03	-	-
G	Sitanion hystrix	a74	a49	c298	b233	.54	1.57	6.89	6.19
G	Stipa comata	a-	a-	a-	b9	-	-	-	.04
G	Stipa lettermani	-	-	-	-	.01	-	-	-
Total for Annual Grasses		2	16	77	139	0.00	0.21	0.37	1.22
Total for Perennial Grasses		84	55	324	262	0.74	1.93	7.24	6.80
Total for Grasses		86	71	401	401	0.74	2.15	7.62	8.02
F	Antennaria sp.	1	-	-	2	.00	-	-	.00
F	Arabis sp.	ab7	a1	bc21	c33	.02	.01	.05	.07
F	Astragalus beckwithii	ab14	b30	a8	ab17	.07	1.73	.02	.29
F	Astragalus convallarius	5	3	1	2	.15	.04	.00	.00
F	Chaenactis douglasii	ab5	a-	b23	b20	.04	-	.32	.39
F	Chenopodium leptophyllum(a)	a-	a-	b17	ab4	-	-	.03	.01
F	Crepis acuminata	3	-	1	4	.00	-	.00	.01
F	Cryptantha bakeri	10	16	16	25	.10	.25	.09	.07
F	Descurainia pinnata (a)	1	-	-	-	.00	-	-	-
F	Erigeron eatonii	-	-	-	1	-	-	-	.01
F	Erigeron pumilus	ab24	a8	c40	bc42	.14	.24	.25	.31
F	Eriogonum cernuum (a)	-	-	2	16	-	-	.03	.16
F	Eriogonum racemosum	a3	a10	b34	b36	.05	.20	.42	.58
F	Eriogonum umbellatum	-	-	2	6	-	-	.00	.04
F	Gayophytum ramosissimum(a)	a-	b73	a3	a1	-	.55	.00	.00
F	Gilia sp. (a)	-	5	-	-	-	.07	-	-

T y p e	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Hedysarum boreale	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>12</sup>	-	-	-	.18
F	Hymenopappus filifolius	-	1	-	-	-	.15	-	-
F	Hymenoxys richardsonii	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>14</sup>	-	-	-	.60
F	Ipomopsis aggregata	-	-	2	-	-	-	.00	-
F	Linum lewisii	-	-	-	3	-	-	-	.01
F	Lotus utahensis	ab <sup>7</sup>	b <sup>10</sup>	a <sup>1</sup>	a <sup>-</sup>	.01	.22	.03	-
F	Lygodesmia spinosa	a <sup>1</sup>	ab <sup>8</sup>	bc <sup>16</sup>	c <sup>23</sup>	.00	.22	.74	.68
F	Machaeranthera canescens	a <sup>-</sup>	a <sup>2</sup>	b <sup>42</sup>	c <sup>74</sup>	.03	.19	.30	1.03
F	Oenothera caespitosa	a <sup>-</sup>	b <sup>7</sup>	b <sup>8</sup>	a <sup>-</sup>	-	.68	.01	-
F	Penstemon comarrhenus	-	-	-	2	-	-	-	.00
F	Petradoria pumila	4	3	17	13	.09	.18	.43	.66
F	Phlox longifolia	5	6	8	5	.01	.01	.01	.01
F	Polygonum douglasii (a)	-	-	-	5	-	-	-	.01
F	Senecio multilobatus	b <sup>34</sup>	c <sup>56</sup>	a <sup>1</sup>	ab <sup>12</sup>	.06	1.58	.03	.16
F	Streptanthus cordatus	1	-	1	-	.00	-	.00	-
F	Tragopogon dubius (a)	-	1	-	-	-	.00	-	-
Total for Annual Forbs		1	79	22	26	0.00	0.62	0.07	0.19
Total for Perennial Forbs		124	161	242	346	0.82	5.74	2.75	5.17
Total for Forbs		125	240	264	372	0.83	6.37	2.82	5.36

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 28

T y p e	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia frigida	-	-	.03	.00	-	.08	.06
B	Artemisia nova	1.67	-	-	-	-	-	-
B	Artemisia tridentata vaseyana	21.14	5.35	6.94	11.91	6.26	10.66	17.36
B	Chrysothamnus nauseosus	-	.51	1.31	.26	.46	1.88	.31
B	Chrysothamnus parryi	-	-	-	.18	-	-	.06
B	Chrysothamnus viscidiflorus viscidiflorus	.03	.38	.86	3.15	.28	1.20	4.31
B	Gutierrezia sarothrae	.25	.93	3.62	1.99	1.25	2.95	1.80
B	Juniperus scopulorum	1.51	.15	.18	.53	.78	.90	1.04
B	Pediocactus simpsonii	-	.00	-	-	-	-	-
B	Pinus edulis	2.62	-	-	-	-	-	-
B	Purshia tridentata	10.36	.00	.15	.03	-	-	-
B	Tetradymia canescens	-	-	-	-	-	-	.05
Total for Browse		37.60	7.35	13.09	18.07	9.03	17.67	24.99

POINT-QUARTER TREE DATA--  
Management unit 25C, Study no: 28

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus scopulorum	29	-	22	23
Pinus edulis	46	-	23	23

Average diameter (in)			
'98	'03	'08	'13
5.4	-	6.2	4.8
3.4	-	1.6	1.9

BASIC COVER--  
Management unit 25C, Study no: 28

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	42.78	14.67	29.50	31.48
Rock	15.84	30.12	21.12	31.79
Pavement	32.10	38.39	29.91	20.07
Litter	34.57	13.84	22.99	25.63
Cryptogams	0	0	0	.03
Bare Ground	4.58	11.24	6.44	10.07

PELLET GROUP DATA--  
Management unit 25C, Study no: 28

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	7	1	74	4
Elk	-	-	9	15
Deer	14	1	8	7
Cattle	-	-	6	7

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
1 (2)	-	13 (33)	23 (56)
18 (44)	11 (26)	9 (22)	12 (30)
21 (52)	1 (2)	19 (47)	16 (39)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 28

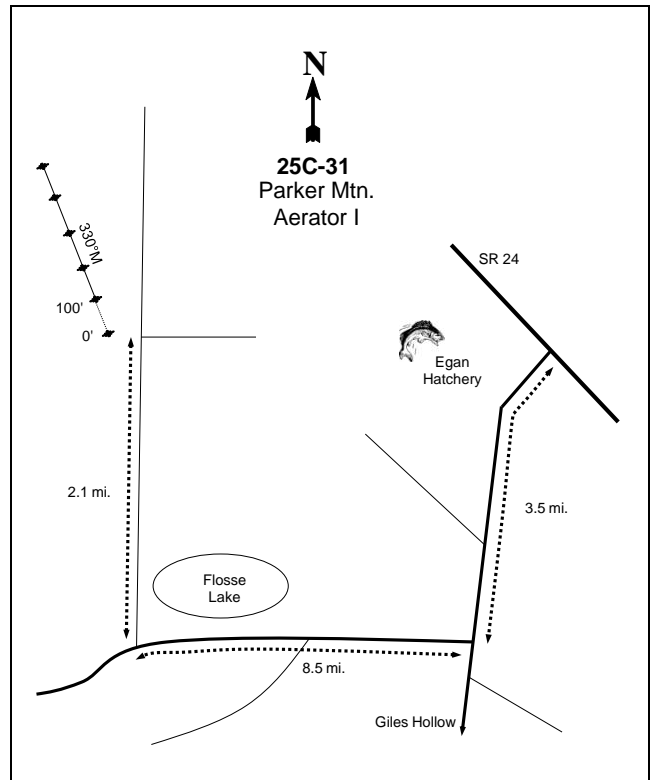
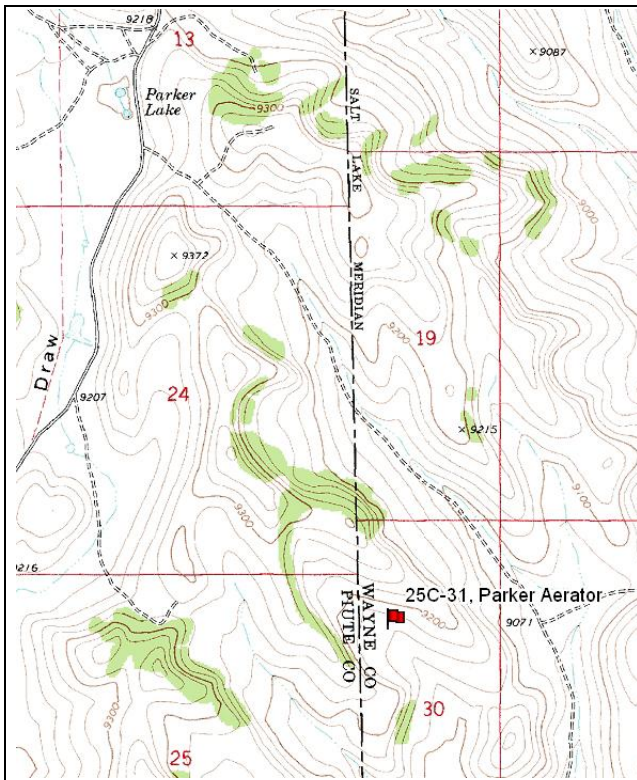
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Artemisia frigida</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	-	100	0	0	9/11
13	40	100	0	-	-	0	0	0	-/-
<b>Artemisia nova</b>									
98	340	0	82	18	-	29	0	6	11/18
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-
<b>Artemisia tridentata vaseyana</b>									
98	6380	3	77	19	40	38	1	19	15/26
03	1520	9	62	29	40	0	0	11	15/26
08	4120	21	58	20	320	26	.48	8	15/26
13	5420	30	68	2	1880	31	3	15	16/29

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus nauseosus</b>										
98	40	0	100	0	-	0	0	0	10/14	
03	240	0	100	0	-	0	0	0	11/14	
08	2140	29	51	20	-	18	5	3	13/20	
13	580	10	90	0	-	48	28	28	8/13	
<b>Chrysothamnus parryi</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	220	9	91	-	-	0	0	0	10/11	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
98	140	14	86	0	-	0	0	0	10/9	
03	80	0	100	0	-	0	0	0	12/16	
08	3340	50	40	10	220	53	29	3	11/16	
13	8760	18	81	1	480	.68	0	9	10/15	
<b>Gutierrezia sarothrae</b>										
98	180	11	89	0	60	0	0	0	11/9	
03	1160	2	98	0	-	0	0	0	10/11	
08	4560	8	82	9	80	0	0	2	8/10	
13	3860	25	74	1	1680	0	0	.51	6/6	
<b>Juniperus scopulorum</b>										
98	40	50	50	-	60	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	-/-	
08	20	0	100	-	-	0	0	0	-/-	
13	40	50	50	-	-	0	0	0	-/-	
<b>Pediocactus simpsonii</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	40	0	100	-	-	0	0	0	1/2	
08	40	50	50	-	-	0	0	0	2/3	
13	0	0	0	-	-	0	0	0	2/3	
<b>Pinus edulis</b>										
98	180	78	22	-	40	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Purshia tridentata</b>										
98	1100	11	80	9	60	47	0	4	28/56	
03	80	25	50	25	20	25	50	25	15/23	
08	120	17	50	33	40	50	33	17	21/41	
13	140	0	100	0	40	29	71	0	21/39	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Ribes</i> sp.										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	25/30	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Symphoricarpos oreophilus</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	13/29	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Tetradymia canescens</i>										
98	<b>0</b>	0	0	0	-	0	0	0	-/-	
03	<b>20</b>	0	100	0	-	0	0	0	10/14	
08	<b>40</b>	0	0	100	-	50	50	0	8/15	
13	<b>20</b>	0	0	100	-	0	0	0	11/17	



PARKER MOUNTAIN AERATOR - TREND STUDY NO. 25C-31



**Location Information**

USGS 7.5 min Map Info Jakes Knoll; Township 29S, Range 1E, Section 29  
 GPS (0' Stake) NAD 83, UTM Zone 12, 426889 East 4235143 North

**Transect Information**

Browse Tag # (0' Stake) 158  
 Transect Bearing 330° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft ), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

While driving on SR 24 south of Bicknell, turn west on Bicknell Circle. Drive 3.5 miles and take a left hand turn (you will pass the Egan Fish Hatchery). Drive for 8.5 miles on the main road taking a right turn going north. Drive 2.1 miles to a road going off to the right (east). Park here and walk 64 paces at 200 degrees magnetic to the 0ft stake. The 0ft stake is marked by browse tag # 158.

**Site Information**

Land Ownership SITLA  
 Allotment Not Available  
 Elevation 9,100ft (2,774m)  
 Aspect East  
 Slope 3%  
 Sample Dates 09/10/2003, 08/14/2008, 08/08/2013

**DISTURBANCE HISTORY--**

Management unit 25C, Study no: 31

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Aerator (2-Way)	-	-	2002	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer; Pronghorn, Crucial Summer; Sage-Grouse, Habitat Not Winter, Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 25C, Study no: 31

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2003-2013	Mountain Big Sagebrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Due to the difficulties in distinguishing between pronghorn and deer pellet groups, pronghorn pellet groups have been reported with deer pellet groups (Table - Pellet Groups Data). In 2013, all the grasses that were not sheltered by shrubs were heavily grazed. Sage-grouse were also seen near the site, but no pellet groups were observed.

**Site Potential**

1981-2010 Average Annual Precipitation 23 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

**SOIL ANALYSIS DATA--**

Management unit 25C, Study no: 31

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	44.6	32.7	22.7	6.7	0.4	2.3	37.7	838.4	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 2003, the site has been dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a diverse understory of perennial grasses and forbs. Since the aerator treatment, mountain big

sagebrush has increased in cover and the age class distribution has diversified (Table - Browse Trends; Table - Herbaceous Trends).

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 25C, Study no: 31

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Agropyron dasystachyum	<sub>a</sub> 99	<sub>b</sub> 172	<sub>a</sub> 85	.92	2.44	.72
G	Carex sp.	231	236	254	2.66	5.30	6.29
G	Festuca ovina	12	17	22	.12	.28	.31
G	Poa fendleriana	23	28	36	.22	.64	.36
G	Poa pratensis	32	26	20	.52	.32	.14
G	Poa secunda	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 41	-	.00	.39
G	Sitanion hystrix	16	41	7	.31	.31	.02
G	Stipa columbiana	24	23	3	.95	.27	.03
G	Stipa comata	5	3	2	.30	.03	.03
G	Stipa lettermani	<sub>a</sub> 98	<sub>b</sub> 155	<sub>b</sub> 173	1.82	3.52	3.87
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		540	702	643	7.84	13.14	12.18
Total for Grasses		540	702	643	7.84	13.14	12.18
F	Androsace septentrionalis (a)	<sub>b</sub> 58	<sub>a</sub> 4	<sub>b</sub> 11	.38	.01	.04
F	Antennaria parvifolia	8	3	5	.18	.15	.18
F	Arabis sp.	<sub>a</sub> -	<sub>b</sub> 13	<sub>ab</sub> 6	-	.08	.02
F	Arenaria fendleri	1	4	-	.00	.00	-
F	Astragalus convallarius	5	39	19	.04	.40	.18
F	Astragalus sp.	<sub>a</sub> 24	<sub>b</sub> 63	<sub>c</sub> 156	.16	1.18	1.23
F	Castilleja linariaefolia	-	-	1	-	-	.00
F	Chenopodium leptophyllum(a)	3	4	-	.01	.01	-
F	Cirsium sp.	10	17	16	.24	.25	.16
F	Collinsia parviflora (a)	-	1	-	-	.00	-
F	Cryptantha sp.	-	3	-	-	.00	-
F	Descurainia pinnata (a)	<sub>b</sub> 12	<sub>a</sub> -	<sub>a</sub> -	.03	-	-
F	Erigeron pumilus	-	-	1	-	-	.00
F	Eriogonum racemosum	20	25	30	.23	.29	.26
F	Eriogonum sp.	3	-	-	.00	-	-
F	Gayophytum ramosissimum(a)	<sub>b</sub> 50	<sub>a</sub> -	<sub>a</sub> -	.22	-	-
F	Hymenoxys richardsonii	4	4	1	.06	.06	.03
F	Lotus utahensis	-	1	2	-	.00	.01
F	Lupinus argenteus	<sub>a</sub> 89	<sub>b</sub> 129	<sub>b</sub> 131	3.67	7.73	5.25
F	Lychnis drummondii	-	-	1	-	.00	.00
F	Penstemon sp.	<sub>b</sub> 54	<sub>ab</sub> 53	<sub>a</sub> 32	.93	.74	.13
F	Phlox longifolia	35	49	44	.08	.32	.19
F	Polygonum douglasii (a)	8	8	9	.05	.02	.01
F	Potentilla gracilis	<sub>b</sub> 22	<sub>a</sub> -	<sub>b</sub> 9	.24	-	.05
F	Potentilla hippiana	<sub>a</sub> 5	<sub>b</sub> 18	<sub>ab</sub> 14	.04	.39	.14

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
F	Senecio multilobatus	8	-	-	.04	-	-
F	Taraxacum officinale	19	15	11	.20	.13	.05
Total for Annual Forbs		131	17	20	0.69	0.04	0.06
Total for Perennial Forbs		307	436	479	6.16	11.75	7.92
Total for Forbs		438	453	499	6.86	11.80	7.98

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

#### BROWSE TRENDS--

Management unit 25C, Study no: 31

Type	Species	Quadrat Cover %			Line Intercept Cover%		
		'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	12.98	24.65	29.00	11.80	34.78	37.53
B	Rosa woodsii	.03	.15	.03	-	-	-
B	Symphoricarpos oreophilus	.06	.03	.03	-	.13	.28
Total for Browse		13.08	24.85	29.06	11.8	34.91	37.81

#### BASIC COVER--

Management unit 25C, Study no: 31

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	25.99	55.72	52.29
Rock	1.41	1.15	.47
Pavement	.74	1.02	.41
Litter	63.22	52.97	58.49
Cryptogams	.08	0	0
Bare Ground	16.86	12.58	9.75

#### PELLET GROUP DATA--

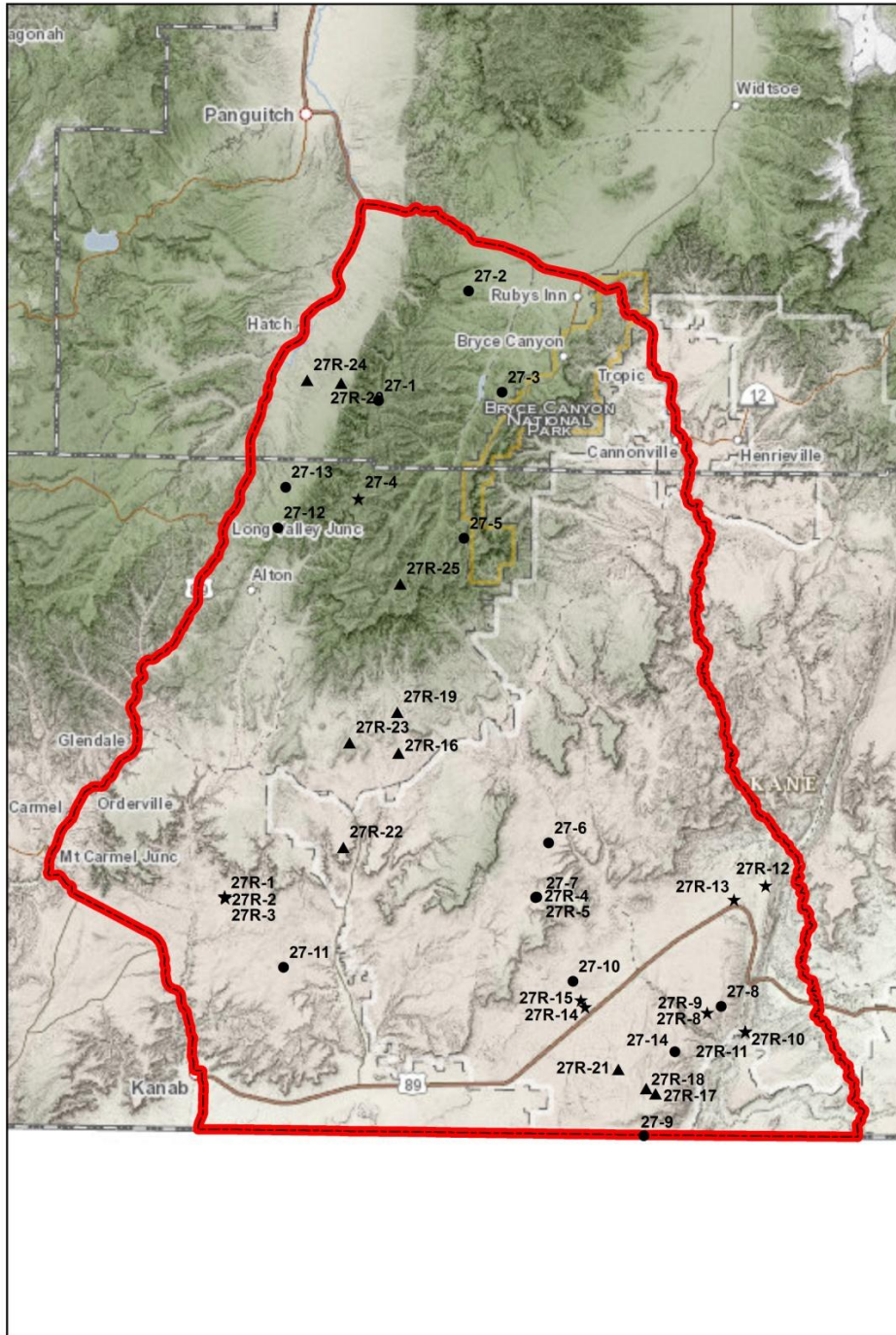
Management unit 25C, Study no: 31

Type	Quadrat Frequency			Days use per acre (ha)		
	'03	'08	'13	'03	'08	'13
Rabbit	72	68	9	-	-	-
Grouse	5	-	-	-	-	-
Elk	1	2	-	-	4 (10)	2 (5)
Deer/ Pronghorn	7	28	18	13 (33)	15 (38)	15 (38)
Cattle	3	10	8	8 (20)	25 (63)	50 (124)

BROWSE CHARACTERISTICS--  
Management unit 25C, Study no: 31

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
03	<b>7100</b>	16	48	35	1740	.56	0	37	12/17	
08	<b>18320</b>	63	31	6	4320	8	0	5	17/33	
13	<b>8360</b>	26	65	9	180	27	0	16	20/33	
<i>Cercocarpus montanus</i>										
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	19/41	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus nauseosus</i>										
03	<b>0</b>	0	0	-	20	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus viscidiflorus</i>										
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	40	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Rosa woodsii</i>										
03	<b>120</b>	0	100	-	-	0	0	0	6/7	
08	<b>100</b>	60	40	-	-	60	40	0	6/6	
13	<b>100</b>	80	20	-	-	0	0	0	7/8	
<i>Symphoricarpos oreophilus</i>										
03	<b>200</b>	20	60	20	-	0	20	10	9/11	
08	<b>140</b>	0	100	0	-	14	29	0	10/20	
13	<b>120</b>	33	67	0	-	17	17	17	13/19	

# WILDLIFE MANAGEMENT UNIT 27 - PAUNSAUGUNT

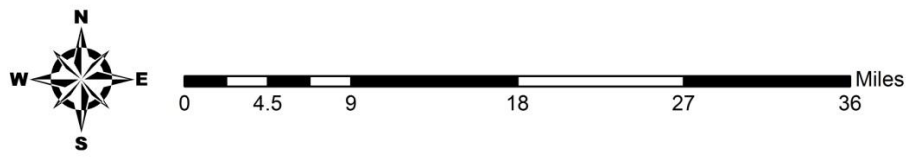
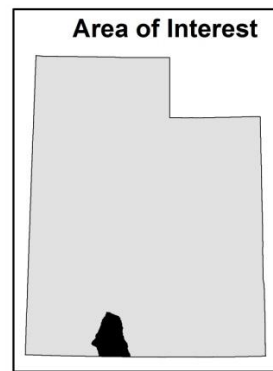


  Unit - 27

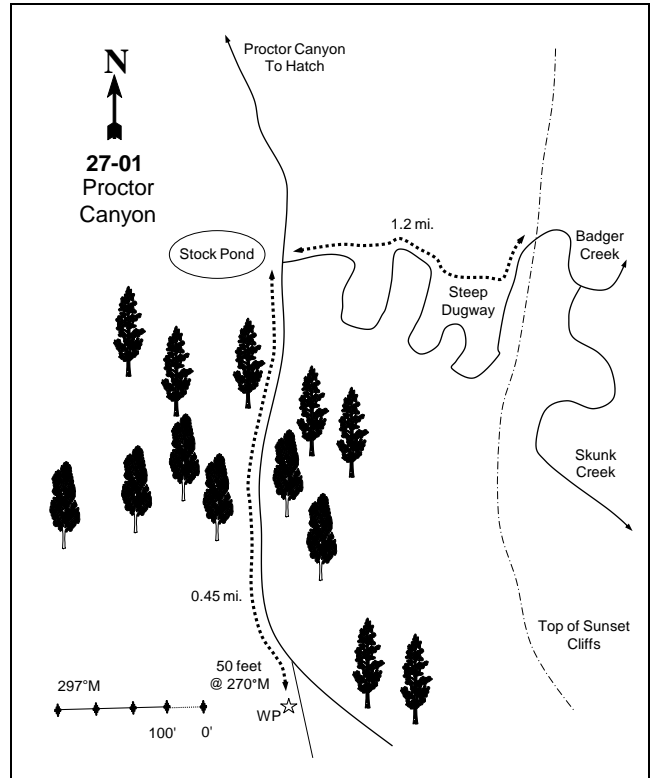
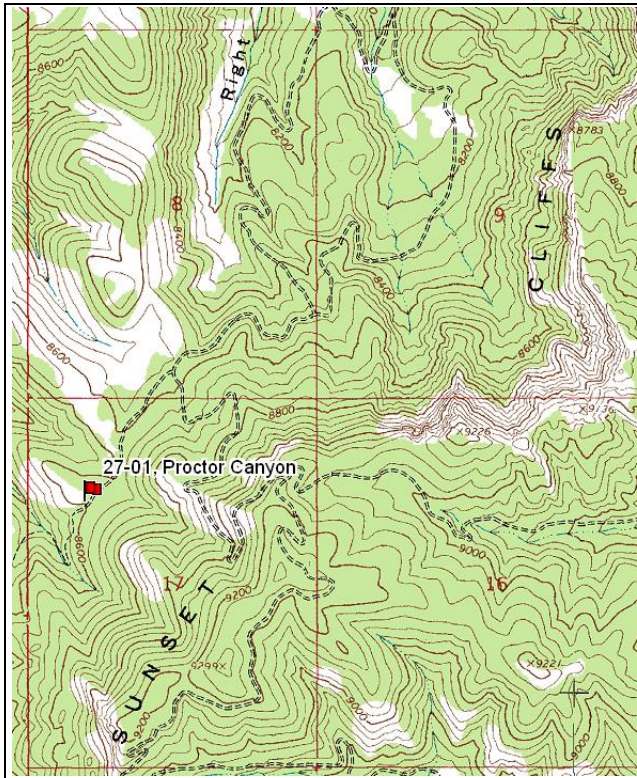
**Study Location**

**PROJECT, STATUS**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active
- ★ WRI, Suspended



PROCTOR CANYON - TREND STUDY NO. 27-1



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Tropic Reservoir; Township 37S, Range 4.5W, Section 17  
NAD 83, UTM Zone 12, 380077 East 4161288 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

7161  
297° magnetic  
400ft  
Line 1 (11ft & 71ft), Line 2 (95ft), Line 3 (59ft), Line 4 (34ft)  
Line 4 is only 50 feet long, No Rebar

**Directions to Site**

At the south end of Tropic Reservoir, turn west off the East Fork Sevier Road and proceed up Badger Creek 2.45 miles. Keep left at the fork and continue towards Proctor Canyon 3.5 miles to a fork at the top of the mountain. Go right towards Hatch for 1.2 miles, down a narrow, rocky dugway, to a fork in the aspens. Turn hard left towards Big Hollow/Camp Eli, and go 0.45 miles to a clearing and the witness post. The frequency baseline starts near the top of the hill and runs west-northwest. The trend study is marked by 2 foot tall green fence posts. The 0-foot baseline stake is 50 west of the witness post and is marked with a red browse tag #7161.

**Site Information**

Land Ownership USFS  
 Allotment Hatch C&H  
 Elevation 8,360ft (2,548m)  
 Aspect West  
 Slope 1-7%  
 Sample Dates 09/01/1987, 08/13/1992, 08/05/1997, 07/17/2003, 07/16/2008, 07/31/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer, Calving

VEGETATION HISTORY--

Management unit 27, Study no: 1

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The small open ridge top where the study is located is a mixed mountain brush community surrounded by dense conifer forest and quaking aspen (*Populus tremuloides*) stands. It is representative of a larger, but more inaccessible, open ridges to the northwest. In the same cattle allotment one-half mile to the north is a seeded area and stock pond. Deer sign, consisting of pellet groups and antler drops, was noted in 1992, along with a few elk pellet groups.

**Site Potential**

1981-2010 Average Annual Precipitation 23 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Browse)  
 NRCS Ecological Site # R047XB420UT

SOIL ANALYSIS DATA--

Management unit 27, Study no: 1

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	80.0	7.1	12.9	7.1	0.4	1.5	8.0	54.4	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1987, that the site has been in a stable state of a mixed mountain browse community type consisting of antelope bitterbrush (*Purshia tridentata*), black sagebrush (*Artemisia nova*), and stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) (Table - Browse Trends). The herbaceous understory has been well developed and has consisted of a diverse number of native plant species. No single herbaceous plant species has been dominant over the study years (Table - Herbaceous Trends). The site may have the potential to transition to a mixed conifer state with out disturbance such as fire, as the surrounding area is dominated by conifers.



## Trend Summary

### HERBACEOUS TRENDS--

Management unit 27, Study no: 1

T y p e	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
G	Agropyron spicatum	b28	b30	a-	b24	a-	.16	.07	-	.34	-
G	Agropyron trachycaulum	b126	a43	a54	a71	ab82	1.71	.13	.62	.81	1.23
G	Bouteloua gracilis	ab16	b14	a3	ab5	ab6	.36	.15	.03	.03	.18
G	Bromus anomalus	c45	a1	a-	a3	b8	.75	.00	.00	.03	.07
G	Bromus tectorum (a)	-	-	-	-	1	-	-	-	-	.00
G	Carex sp.	b27	ab12	a7	ab11	ab22	.87	.10	.09	.19	.38
G	Koeleria cristata	c168	ab85	ab75	bc123	a52	2.99	.61	1.11	1.67	1.02
G	Poa fendleriana	ab88	a48	ab85	ab82	b101	2.53	.54	1.15	1.52	2.33
G	Poa pratensis	a45	b116	a48	b96	b101	2.99	2.26	1.68	1.83	1.41
G	Stipa columbiana	1	16	9	1	11	.03	.08	.04	.00	.07
G	Stipa comata	b109	b138	b112	a45	a35	3.22	3.13	3.26	1.04	.55
G	Stipa lettermani	b128	ab91	ab101	ab83	a74	2.85	1.20	1.12	2.05	1.54
Total for Annual Grasses		0	0	0	0	1	0	0	0	0	0.00
Total for Perennial Grasses		781	594	494	544	492	18.50	8.29	9.12	9.55	8.81
Total for Grasses		781	594	494	544	493	18.50	8.29	9.12	9.55	8.81
F	Achillea millefolium	ab43	b57	a20	ab45	b62	.82	.58	.07	.46	1.00
F	Agoseris glauca	a-	a-	a5	b12	a-	-	-	.04	.08	-
F	Alyssum alyssoides (a)	-	-	6	4	-	-	-	.01	.00	-
F	Androsace septentrionalis (a)	8	2	5	8	3	.02	.00	.03	.01	.01
F	Antennaria sp.	3	3	-	5	2	.15	.15	-	.03	.38
F	Arabis sp.	1	2	-	1	-	.00	.00	-	.00	-
F	Artemisia dracunculus	b37	b25	a4	a-	a1	1.12	.66	.09	-	.03
F	Artemisia ludoviciana	7	6	-	-	-	.06	.06	-	-	-
F	Aster chilensis	b69	b48	a16	a6	a20	.67	.21	.07	.03	.11
F	Astragalus humistratus	b31	ab30	a1	ab16	b28	.42	.22	.00	.33	.50
F	Astragalus sp.	-	-	-	-	2	-	-	-	-	.03
F	Astragalus tenellus	5	8	3	-	3	.06	.01	.04	-	.00
F	Calochortus nuttallii	ab7	a4	ab8	b20	a-	.01	.01	.04	.04	-
F	Castilleja linariaefolia	2	12	3	7	8	.00	.05	.01	.04	.04
F	Chaenactis douglasii	1	-	-	-	-	.00	-	-	-	-
F	Chenopodium fremontii (a)	-	1	-	-	-	-	.00	-	-	-
F	Chenopodium leptophyllum(a)	-	3	1	-	-	-	.00	.00	-	-
F	Cirsium arizonicum	b41	ab37	a11	a15	a16	1.17	.43	.08	.42	.28
F	Collinsia parviflora (a)	a-	a-	b13	a-	a-	-	-	.02	-	-
F	Cordylanthus sp. (a)	-	-	-	-	8	-	-	-	-	.02
F	Crepis acuminata	-	2	3	1	-	-	.00	.06	.00	-
F	Erigeron eatonii	a-	b12	ab1	b6	b9	-	.12	.00	.03	.07
F	Erigeron flagellaris	b70	a7	a10	a5	b42	.52	.01	.05	.18	.86
F	Erigeron pumilus	5	10	13	10	7	.15	.03	.13	.10	.19
F	Eriogonum racemosum	45	52	39	53	37	1.02	.34	.37	.64	.42

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
F	<i>Eriogonum umbellatum</i>	b <sub>50</sub>	ab <sub>29</sub>	ab <sub>30</sub>	ab <sub>30</sub>	a <sub>16</sub>	1.06	1.16	.57	.62	.28
F	<i>Fritillaria atropurpurea</i>	-	4	-	-	-	-	.01	-	-	-
F	<i>Gayophytum ramosissimum</i> (a)	a <sup>-</sup>	ab <sub>3</sub>	b <sub>11</sub>	ab <sub>8</sub>	ab <sub>3</sub>	-	.00	.05	.04	.00
F	<i>Hymenoxys richardsonii</i>	c <sub>23</sub>	a <sup>-</sup>	b <sub>10</sub>	b <sub>14</sub>	ab <sub>3</sub>	.23	-	.22	.42	.06
F	<i>Ipomopsis aggregata</i>	b <sub>17</sub>	ab <sub>6</sub>	a <sup>-</sup>	a <sup>-</sup>	ab <sub>3</sub>	.08	.01	-	-	.03
F	<i>Linum lewisii</i>	b <sub>21</sub>	b <sub>18</sub>	a <sup>-</sup>	ab <sub>7</sub>	ab <sub>4</sub>	.26	.05	-	.10	.06
F	<i>Lychnis drummondii</i>	10	1	6	-	1	.02	.00	.01	-	.03
F	<i>Machaeranthera canescens</i>	17	13	22	18	15	.06	.12	.28	.77	.33
F	<i>Microsteris gracilis</i> (a)	-	-	9	-	-	-	-	.04	-	-
F	<i>Oenothera caespitosa</i>	2	-	-	-	-	.03	-	-	-	-
F	<i>Oenothera pallida</i>	ab <sub>3</sub>	a <sup>-</sup>	ab <sub>14</sub>	b <sub>12</sub>	b <sub>15</sub>	.00	-	.19	.10	.15
F	<i>Orthocarpus luteus</i> (a)	c <sub>58</sub>	b <sub>14</sub>	c <sub>47</sub>	c <sub>50</sub>	a <sup>-</sup>	1.53	.16	.41	.82	-
F	<i>Penstemon comarrhenus</i>	b <sub>43</sub>	ab <sub>41</sub>	ab <sub>24</sub>	ab <sub>36</sub>	a <sub>17</sub>	.15	.21	.13	.26	.06
F	<i>Penstemon humilis</i>	-	-	3	7	6	-	-	.00	.21	.01
F	<i>Phlox longifolia</i>	b <sub>68</sub>	b <sub>58</sub>	a <sub>17</sub>	b <sub>76</sub>	ab <sub>44</sub>	.45	.27	.04	.24	.17
F	<i>Polygonum douglasii</i> (a)	b <sub>87</sub>	b <sub>61</sub>	a <sub>2</sub>	a <sub>13</sub>	a <sub>9</sub>	.28	.12	.01	.03	.02
F	<i>Potentilla hippiana</i>	24	33	26	31	23	.87	.65	.46	.58	.33
F	<i>Senecio douglasii</i>	-	-	-	2	-	-	-	-	.03	-
F	<i>Taraxacum officinale</i>	1	4	-	7	5	.00	.01	-	.02	.04
F	<i>Tragopogon dubius</i> (a)	b <sub>15</sub>	ab <sub>10</sub>	a <sup>-</sup>	ab <sub>6</sub>	a <sup>-</sup>	.08	.02	-	.03	-
Total for Annual Forbs		168	94	94	89	23	1.92	0.33	0.60	0.95	0.06
Total for Perennial Forbs		646	522	289	442	389	9.45	5.44	3.00	5.83	5.54
Total for Forbs		814	616	383	531	412	11.38	5.77	3.61	6.78	5.61

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

#### BROWSE TRENDS--

Management unit 27, Study no: 1

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	<i>Amelanchier utahensis</i>	3.45	2.30	4.71	4.21	2.86	3.85	2.95	3.36
B	<i>Artemisia nova</i>	4.94	5.62	7.39	8.25	7.98	6.15	8.91	9.46
B	<i>Atriplex canescens</i>	-	-	-	-	.15	-	-	-
B	<i>Chrysothamnus depressus</i>	1.22	1.36	1.04	2.03	2.11	1.61	2.61	2.28
B	<i>Chrysothamnus parryi attenuatus</i>	.24	.01	.04	-	.15	.23	.20	.55
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	4.99	4.16	5.74	6.05	6.11	5.26	11.41	6.85
B	<i>Gutierrezia sarothrae</i>	.33	.03	.03	.21	-	-	-	-
B	<i>Juniperus scopulorum</i>	4.29	3.40	2.79	2.91	5.21	7.60	8.03	9.23
B	<i>Mahonia repens</i>	-	.00	-	-	-	-	-	-
B	<i>Opuntia sp.</i>	-	-	-	-	.00	-	-	-
B	<i>Pinus ponderosa</i>	.00	-	-	-	-	-	.55	.76
B	<i>Purshia tridentata</i>	22.88	22.12	19.85	14.46	20.55	25.61	28.88	30.21

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	Ribes cereum inebrians	1.74	1.79	1.86	.53	.74	1.40	1.60	1.53
B	Rosa woodsii	.85	.78	.45	1.94	1.36	.66	2.55	1.65
B	Symphoricarpos oreophilus	2.37	3.03	3.41	2.99	2.26	4.25	5.88	3.43
B	Tetradymia canescens	1.06	.21	.69	.73	.33	1.16	2.01	.40
Total for Browse		48.41	44.83	48.04	44.32	49.83	57.78	75.58	69.71

BASIC COVER--

Management unit 27, Study no: 1

Cover Type	Average Cover %				
	'92	'97	'03	'08	'13
Vegetation	63.12	53.10	57.48	63.29	60.31
Rock	2.83	.37	.77	.79	.42
Pavement	0	1.62	.67	1.89	.93
Litter	40.95	50.03	48.00	41.98	50.10
Cryptogams	.16	.83	.42	.07	.30
Bare Ground	20.06	21.83	23.27	14.78	23.69

PELLET GROUP DATA--

Management unit 27, Study no: 1

Type	Quadrat Frequency					Days use per acre (ha)		
	'92	'97	'03	'08	'13	'03	'08	'13
Rabbit	6	1	6	17	-	-	-	-
Elk	3	2	5	1	-	2 (5)	2 (5)	1 (2)
Deer	12	22	19	16	4	49 (121)	78 (193)	15 (36)
Cattle	-	2	4	3	6	8 (20)	-	14 (34)

BROWSE CHARACTERISTICS--

Management unit 27, Study no: 1

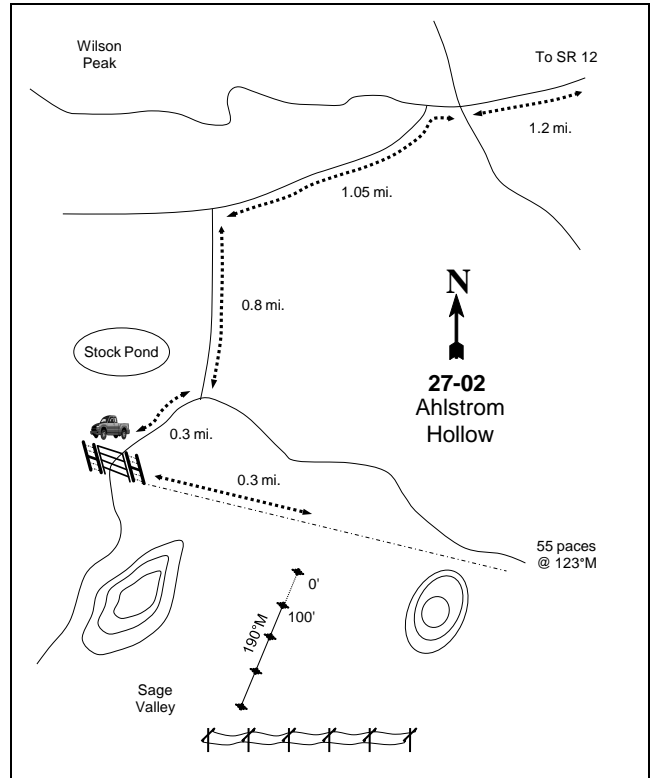
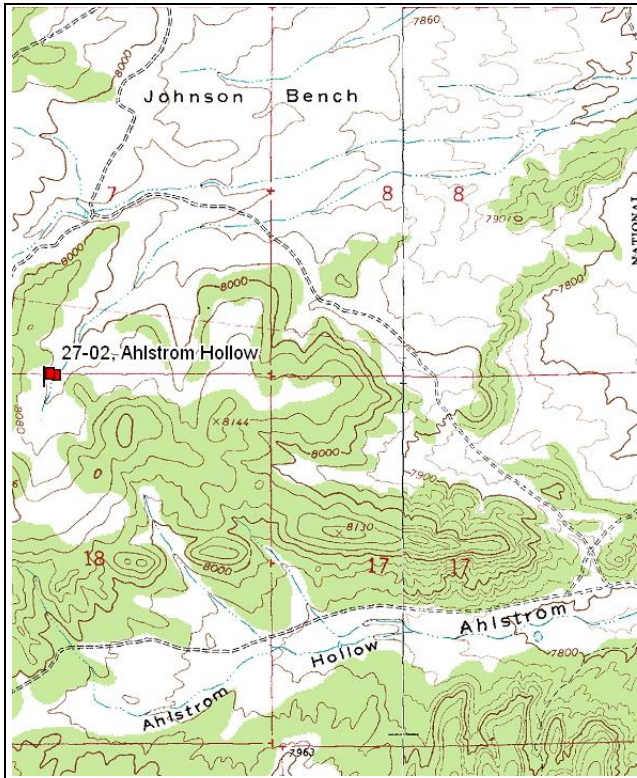
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Amelanchier utahensis									
92	<b>1000</b>	62	28	10	-	66	8	94	-/-
97	<b>480</b>	17	83	0	-	58	8	0	44/41
03	<b>440</b>	14	73	14	-	23	32	5	42/40
08	<b>460</b>	13	70	17	-	30	4	17	45/49
13	<b>380</b>	5	84	11	-	32	37	11	52/53
Artemisia frigida									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	35/28

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia nova</i>										
92	1840	27	62	11	60	12	3	0	-/-	
97	1540	12	66	22	20	10	0	6	14/27	
03	2720	19	71	10	-	10	0	.73	19/27	
08	3100	12	60	28	960	38	0	7	18/30	
13	2020	17	64	19	-	53	2	18	19/30	
<i>Cercocarpus ledifolius</i>										
92	0	0	0	-	-	0	0	0	-/-	
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	60/47	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus depressus</i>										
92	2880	15	85	0	-	0	0	1	-/-	
97	900	11	87	2	-	0	7	2	4/11	
03	2480	0	100	0	-	6	15	0	4/9	
08	1940	0	100	0	-	45	30	0	4/10	
13	2940	2	98	0	-	55	17	0	4/11	
<i>Chrysothamnus parryi attenuatus</i>										
92	580	31	69	-	-	0	3	0	-/-	
97	320	44	56	-	-	0	0	0	12/7	
03	420	0	100	-	-	0	0	0	6/8	
08	100	0	100	-	100	0	0	0	7/11	
13	60	0	100	-	-	67	0	0	6/13	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
92	5060	35	57	8	80	2	0	2	-/-	
97	3500	3	97	1	-	0	0	0	16/21	
03	3640	0	94	6	-	0	1	.54	14/17	
08	3960	2	87	11	80	0	0	4	19/26	
13	2840	6	89	5	-	7	0	2	19/24	
<i>Gutierrezia sarothrae</i>										
92	580	10	90	-	-	0	0	0	-/-	
97	200	0	100	-	-	0	0	0	7/3	
03	100	80	20	-	-	0	0	0	9/5	
08	80	0	100	-	-	25	0	0	7/10	
13	0	0	0	-	-	0	0	0	-/-	
<i>Juniperus scopulorum</i>										
92	0	0	0	-	-	0	0	0	-/-	
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	20	0	100	-	-	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	-/-	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Mahonia repens</b>									
92	20	100	0	-	-	0	0	0	-/-
97	20	0	100	-	-	0	0	0	3/5
03	0	0	0	-	-	0	0	0	3/5
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Opuntia sp.</b>									
92	60	100	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	3/17
13	20	100	0	-	-	0	0	0	3/6
<b>Pinus ponderosa</b>									
92	20	100	0	-	-	100	0	0	-/-
97	20	100	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Purshia tridentata</b>									
92	3460	21	75	3	180	50	31	0	-/-
97	1680	8	87	5	140	54	33	1	27/56
03	2340	3	92	4	-	9	80	0	24/48
08	1960	0	96	4	60	58	18	3	25/54
13	2700	2	94	4	-	26	50	2	28/56
<b>Ribes cereum inebrians</b>									
92	280	57	36	7	40	0	0	7	-/-
97	80	0	100	0	-	0	0	0	61/72
03	80	0	75	25	-	0	0	0	54/48
08	20	0	100	0	-	100	0	0	47/68
13	100	0	100	0	-	20	0	0	44/52
<b>Rosa woodsii</b>									
92	1880	97	3	-	-	0	0	0	-/-
97	1200	48	52	-	60	0	0	0	14/15
03	1140	70	30	-	120	0	0	0	8/8
08	1140	21	79	-	20	0	0	0	11/9
13	1680	10	90	-	-	2	0	0	13/9
<b>Sarcobatus vermiculatus</b>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b><i>Symphoricarpos oreophilus</i></b>										
92	<b>1260</b>	59	40	2	-	2	0	2	-/-	
97	<b>480</b>	17	79	4	-	8	0	4	17/42	
03	<b>1200</b>	3	95	2	-	2	10	2	14/20	
08	<b>900</b>	18	82	0	-	2	0	0	28/40	
13	<b>1000</b>	32	68	0	-	2	0	0	17/34	
<b><i>Tetradymia canescens</i></b>										
92	<b>820</b>	56	37	7	-	0	0	0	-/-	
97	<b>400</b>	10	75	15	-	0	0	0	15/14	
03	<b>940</b>	17	77	6	-	0	0	0	12/12	
08	<b>640</b>	6	59	34	60	0	0	6	9/12	
13	<b>420</b>	10	90	0	-	5	0	19	9/12	

## AHLSTROM HOLLOW - TREND STUDY NO. 27-2



### Location Information

USGS 7.5 min Map Info  
GPS (0' Stake)

Wilson Peak; Township 36S, Range 4W, Section 18  
NAD 83, UTM Zone 12, 388141 East 4171099 North

### Transect Information

Browse Tag # (0' Stake)	7150
Transect Bearing	190° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)
Belt Marker Placement	Standard

### Directions to Site

From the Bryce Canyon area, take SR 12 west towards Red Canyon. From the Forest Service boundary sign and mile marker 9, go 0.6 miles further west. Turn left onto Wilson Peak Rd #111, cross a cattleguard and go 1.2 miles to the Ahlstrom Hollow road intersection. Pass this 90° intersection and continue 0.05 miles on the Wilson Peak Road to a dirt road going off to the left at a 45° angle. Go down this road 1.05 miles to a fork. Bear left and continue 0.8 miles to a fork by a stock pond. Turn right and go 0.3 miles to a fence. Park here. Walk east along the fenceline up and over a ridge and down to the middle of the next valley. At the bottom of this valley, turn and walk up (south) along the bottom for about 400 yards to the 0-foot baseline marked with a 2-foot fencepost tagged #7150.

**Site Information**

Land Ownership USFS  
 Allotment Blue Fly C&H  
 Elevation 8,040ft (2,451m)  
 Aspect East  
 Slope 8-10%  
 Sample Dates 09/05/1987, 08/12/1992, 07/30/1997, 07/17/2003, 07/17/2008, 07/18/2013

**DISTURBANCE HISTORY--**

Management unit 27, Study no: 2

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	-	-	1997-2002	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer, Calving; Pronghorn Crucial Year-Long, Fawning; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 27, Study no: 2

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The small valley sampled by this trend study is above Johnson Bench, which is in an area seeded mainly with smooth brome (*Bromus inermis*) and other grasses. This particular black sagebrush (*Artemisia nova*) and rabbitbrush (*Chrysothamnus spp.*) valley shows little evidence of the seeding treatments done in the early 1950's.

**Site Potential**

1981-2010 Average Annual Precipitation 18 inches  
 NRCS Taxonomical soil Classification Coarse-loamy, mixed (calcareous), frigid Typic Ustifluvents  
 NRCS Ecological Site Mountain Loam (Black Sagebrush)  
 NRCS Ecological Site # R047XB426UT

**SOIL ANALYSIS DATA--**

Management unit 27, Study no: 2

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	66.4	19.1	14.6	7.4	0.5	2.5	15.9	86.4	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has been in a stable state with black sagebrush being the dominant shrub species (Table – Browse Trends). The herbaceous understory has been well developed and has consisted of a diverse number of native species and a few non-native species (Table – Herbaceous Trends). Part of the site was affected by a fire that removed the shrub component for a limited time, but shrubs have since reestablished in the study area (Table - Disturbance History). A dense population of pinyon pine (*Pinus*



*edulis*) and Utah juniper (*Juniperus osteosperma*) trees occur in the area and are slowly increasing in abundance on the site (Table - Point-Quarter Tree Data). Without treatment or a disturbance, pinyon and juniper tree will likely become dominant on the site.

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 27, Study no: 2

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
G	<i>Agropyron dasystachyum</i>	a-	a-	a2	a-	b140	-	-	.00	-	2.21
G	<i>Agropyron trachycaulum</i>	a14	ab21	b51	c125	ab25	.42	.11	.62	3.49	.94
G	<i>Bouteloua gracilis</i>	b80	b70	a32	b78	ab64	2.23	.72	.29	1.11	1.90
G	<i>Bromus inermis</i>	-	-	-	-	1	-	-	-	-	.00
G	<i>Bromus tectorum</i> (a)	-	3	-	-	2	-	.00	-	-	.00
G	<i>Koeleria cristata</i>	c148	b99	ab81	ab69	a48	3.09	.98	.92	1.28	.46
G	<i>Oryzopsis hymenoides</i>	-	-	-	-	1	.00	-	-	-	.03
G	<i>Poa fendleriana</i>	b268	ab226	ab214	a187	a193	7.54	2.88	4.38	3.37	4.54
G	<i>Poa pratensis</i>	-	-	-	4	-	-	-	-	.06	-
G	<i>Poa secunda</i>	a5	b39	ab24	a10	a10	.01	.81	.24	.19	.10
G	<i>Stipa columbiana</i>	-	-	-	-	-	-	-	-	.00	-
G	<i>Stipa comata</i>	a85	ab125	ab121	b159	ab105	1.95	1.31	2.99	4.44	2.01
G	<i>Stipa lettermani</i>	32	36	9	19	27	.68	.58	.21	.50	.60
G	<i>Vulpia octoflora</i> (a)	-	-	4	-	-	-	-	.00	-	-
Total for Annual Grasses		0	3	4	0	2	0	0.00	0.00	0	0.00
Total for Perennial Grasses		632	616	534	651	614	15.94	7.42	9.67	14.46	12.83
Total for Grasses		632	619	538	651	616	15.94	7.42	9.68	14.46	12.84
F	<i>Agoseris glauca</i>	a-	a1	b37	a9	a1	-	.00	.23	.02	.00
F	<i>Alyssum alyssoides</i> (a)	a-	a-	a-	b7	ab1	-	-	.01	.07	.00
F	<i>Ambrosia</i> sp.	3	-	-	-	-	.06	-	-	-	-
F	<i>Androsace septentrionalis</i> (a)	ab5	ab3	a-	b13	ab4	.04	.00	-	.08	.01
F	<i>Antennaria</i> sp.	6	9	-	3	-	.04	.33	-	.01	-
F	<i>Arabis</i> sp.	b6	b12	a-	ab2	ab4	.02	.03	-	.03	.03
F	<i>Aster chilensis</i>	-	8	-	-	3	-	.01	-	-	.06
F	<i>Astragalus convallarius</i>	-	-	-	-	3	-	-	-	-	.03
F	<i>Astragalus</i> sp.	-	-	-	-	1	-	-	-	-	.00
F	<i>Calochortus nuttallii</i>	-	-	2	2	-	-	-	.00	.00	-
F	<i>Castilleja linariaefolia</i>	a-	a-	ab9	b10	ab1	-	-	.02	.02	.03
F	<i>Castilleja</i> sp.	-	-	-	-	-	-	-	.00	-	-
F	<i>Chenopodium leptophyllum</i> (a)	-	-	2	1	5	-	-	.00	.00	.06
F	<i>Collinsia parviflora</i> (a)	-	-	9	2	-	-	-	.02	.00	-
F	<i>Comandra pallida</i>	-	1	-	-	-	-	.00	-	-	-
F	<i>Cordylanthus</i> sp. (a)	a-	a-	a-	a-	b72	-	-	-	-	.86
F	<i>Crepis acuminata</i>	-	-	4	-	3	-	-	.00	-	.03
F	Cruciferae	3	-	-	-	-	.00	-	-	-	-
F	<i>Cryptantha bakeri</i>	b12	b21	a-	ab6	b11	.06	.05	-	.02	.05
F	<i>Cymopterus</i> sp.	-	1	-	-	-	-	.00	-	-	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
F	Descurainia pinnata (a)	a-	a-	b38	a8	a5	-	-	.68	.01	.01
F	Draba sp. (a)	-	-	2	-	-	-	-	.01	-	-
F	Erigeron eatonii	bc27	a2	ab12	bc30	c35	.33	.01	.02	.19	.41
F	Erigeron pumilus	a1	b22	ab11	ab18	a6	.15	.20	.05	.06	.04
F	Eriogonum racemosum	14	14	8	10	18	.18	.16	.02	.07	.19
F	Eriogonum umbellatum	12	18	15	15	8	.11	.20	.26	.17	.08
F	Euphorbia robusta	3	4	-	-	2	.18	.06	-	-	.00
F	Gayophytum ramosissimum(a)	a-	b15	ab1	ab5	a-	-	.03	.01	.01	-
F	Heterotheca villosa	ab3	a2	ab5	bc20	c21	.15	.03	.06	.64	.31
F	Holosteum umbellatum (a)	-	3	-	-	4	-	.00	-	-	.01
F	Lappula occidentalis (a)	a-	a6	c60	d89	b22	-	.01	1.39	.86	.18
F	Lotus utahensis	21	14	12	18	18	.33	.25	.05	.13	.15
F	Lupinus argenteus	-	-	2	-	-	-	-	.00	-	-
F	Microsteris gracilis (a)	a-	b65	a2	a9	a-	-	.17	.00	.02	-
F	Oenothera pallida	-	3	7	11	2	-	.00	.07	.09	.03
F	Orthocarpus luteus (a)	c129	c115	b36	c106	a-	2.70	1.43	.19	1.43	-
F	Pedicularis centranthera	-	-	-	10	-	-	-	-	.04	-
F	Penstemon comarrhenus	ab17	b12	a-	b15	c26	1.01	.05	-	.12	.19
F	Penstemon sp.	a-	ab8	a1	b14	a-	-	.07	.00	.05	-
F	Phlox longifolia	bc71	c74	a23	a30	ab49	.30	.35	.07	.16	.17
F	Polygonum douglasii (a)	b26	b27	a-	b39	b25	.06	.07	-	.09	.04
F	Senecio multilobatus	-	-	-	-	3	-	-	-	-	.00
F	Sphaeralcea coccinea	-	-	-	2	1	-	-	-	.00	.00
F	Taraxacum officinale	ab7	b8	ab2	ab3	a-	.39	.05	.00	.06	-
F	Tragopogon dubius (a)	-	5	-	2	-	-	.01	-	.00	-
F	Trifolium kingii	ab6	b9	ab1	ab10	a-	.01	.02	.00	.07	-
Total for Annual Forbs		160	239	150	281	138	2.81	1.74	2.33	2.60	1.19
Total for Perennial Forbs		212	243	151	238	216	3.37	1.91	0.91	2.01	1.84
Total for Forbs		372	482	301	519	354	6.18	3.65	3.24	4.62	3.04

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

#### BROWSE TRENDS--

Management unit 27, Study no: 2

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	Artemisia nova	24.25	21.39	15.10	17.68	18.78	15.88	23.25	17.46
B	Chrysothamnus depressus	.67	-	-	.39	.12	-	-	.65
B	Chrysothamnus viscidiflorus viscidiflorus	4.70	1.90	6.95	4.89	5.86	6.89	10.76	9.04
B	Juniperus osteosperma	.15	.85	.85	1.01	1.26	1.96	2.20	2.63
B	Leptodactylon pungens	2.34	.64	.67	.39	.48	.23	.46	.16
B	Opuntia sp.	.03	.00	.00	.03	-	-	-	-
B	Purshia tridentata	.38	.03	-	.38	.41	.50	.50	.78

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	Tetradymia canescens	.09	.24	.06	.18	.23	.08	.20	.11
Total for Browse		32.64	25.07	23.64	24.95	27.17	25.54	37.37	30.83

BASIC COVER--

Management unit 27, Study no: 2

Cover Type	Average Cover %				
	'92	'97	'03	'08	'13
Vegetation	47.05	38.87	38.60	49.75	43.30
Rock	7.93	.07	.54	1.19	.07
Pavement	0	7.14	4.17	5.49	3.27
Litter	31.65	42.92	33.64	39.05	36.20
Cryptogams	.41	.46	.04	.05	.05
Bare Ground	31.40	22.36	37.97	20.20	40.44

PELLET GROUP DATA--

Management unit 27, Study no: 2

Type	Quadrat Frequency					Days use per acre (ha)		
	'92	'97	'03	'08	'13	'03	'08	'13
Rabbit	30	11	13	47	3	-	-	-
Elk	22	7	12	10	3	31 (76)	19 (48)	1 (2)
Deer	6	14	8	3	5	7 (18)	5 (13)	8 (20)
Cattle	3	6	8	10	10	32 (79)	38 (93)	30 (73)

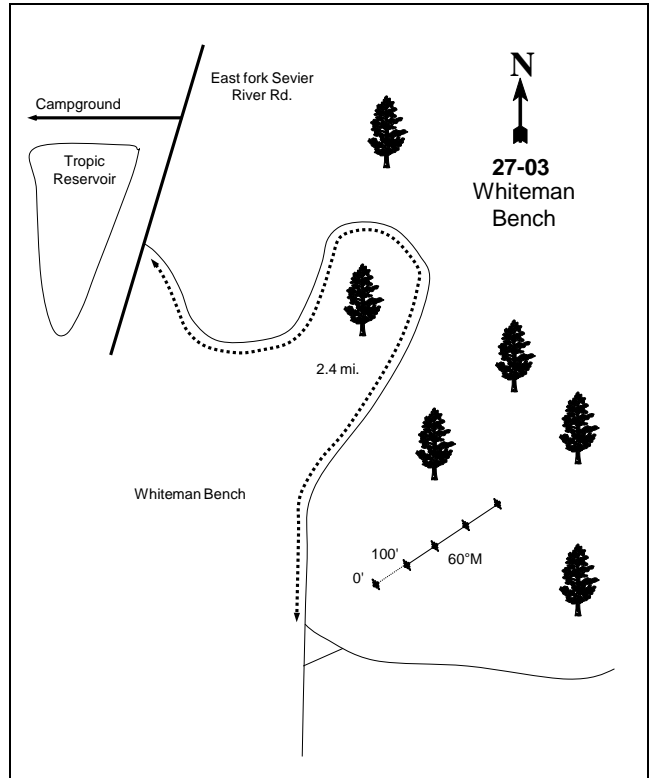
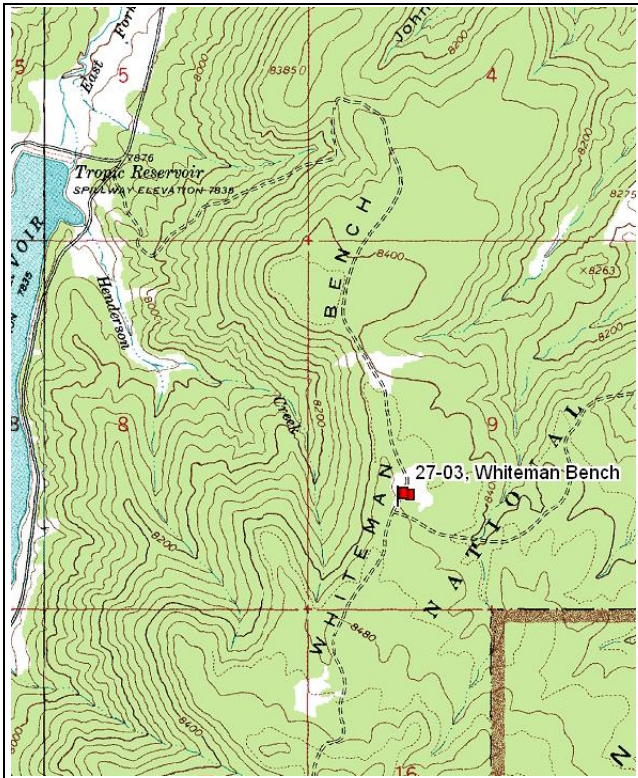
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 2

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
Artemisia frigida									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	11/7
13	0	0	0	-	-	0	0	0	-/-
Artemisia nova									
92	16200	21	56	23	1020	22	2	4	-/-
97	9680	11	75	14	1140	5	0	4	16/27
03	8120	6	74	20	-	9	0	4	15/23
08	7960	13	72	15	1200	7	2	6	15/26
13	7180	21	73	5	920	4	.27	6	11/23

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus depressus</b>										
92	1920	52	48	-	-	5	1	0	-/-	
97	1900	2	98	-	-	0	0	0	10/10	
03	0	0	0	-	-	0	0	0	-/-	
08	600	0	100	-	-	47	3	0	3/8	
13	380	37	63	-	-	0	0	0	5/11	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
92	4080	39	58	3	20	4	.49	.98	-/-	
97	900	2	87	11	-	0	0	2	14/20	
03	4300	0	96	4	-	0	0	.46	12/18	
08	3000	8	62	30	40	2	0	10	14/25	
13	3160	7	91	3	-	0	0	2	15/22	
<b>Juniperus osteosperma</b>										
92	20	100	0	-	-	100	0	0	-/-	
97	40	50	50	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	-/-	
08	20	0	100	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	-/-	
<b>Leptodactylon pungens</b>										
92	5040	8	90	2	-	0	0	2	-/-	
97	2780	8	91	1	60	0	0	1	6/6	
03	1720	2	92	6	-	0	0	5	5/7	
08	1200	5	87	8	-	0	0	0	5/8	
13	1320	24	76	0	20	0	0	0	7/11	
<b>Opuntia sp.</b>										
92	120	83	0	17	-	0	0	0	-/-	
97	20	100	0	0	-	0	0	0	-/-	
03	20	0	100	0	-	0	0	0	-/-	
08	20	0	100	0	-	0	0	0	-/-	
13	20	100	0	0	-	0	0	0	-/-	
<b>Purshia tridentata</b>										
92	100	80	20	0	-	0	60	0	-/-	
97	40	0	100	0	-	50	50	0	21/43	
03	20	0	0	100	-	0	100	0	19/59	
08	40	0	100	0	-	0	100	0	21/51	
13	160	38	63	0	-	25	38	0	22/47	
<b>Tetradymia canescens</b>										
92	420	48	48	5	-	14	5	0	-/-	
97	400	40	60	0	60	0	0	0	9/11	
03	300	7	87	7	-	0	0	7	9/12	
08	280	14	86	0	-	0	0	0	11/17	
13	320	25	75	0	-	31	0	6	10/17	

WHITEMAN BENCH - TREND STUDY NO. 27-3



**Location Information**

USGS 7.5 min Map Info Bryce Point; Township 37S, Range 4W, Section 9  
 GPS (0' Stake) NAD 83, UTM Zone 12, 391136 East 4162028 North

**Transect Information**

Browse Tag # (0' Stake) 7153  
 Transect Bearing 60° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement Belt 5: 11ft

**Directions to Site**

East of the Tropic Reservoir Dam on the East Fork Sevier River Road, take the Whiteman Bench road east for 2.40 miles to a fork in the road. Stop here. Walk east 18 paces to the first stake, a red-painted fencepost 18" high marked with browse tag #7153. The frequency baseline runs NE from here.

### Site Information

Land Ownership USFS  
Allotment East Fork/Crawford  
Elevation 8,420ft (2,566m)  
Aspect North  
Slope 2-3%  
Sample Dates 09/04/1987, 08/12/1992, 08/05/1997, 07/17/2003, 07/17/2008, 07/18/2013

### DISTURBANCE HISTORY--

Management unit 27, Study no: 3

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Logging	-	-	Historic	-

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer; Elk, Crucial Summer, Calving

### VEGETATION HISTORY--

Management unit 27, Study no: 3

Year	Vegetation Type <sup>1</sup>
1985-2013	Ponderosa Pine

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

### Site Notes

No remarks.

### Site Potential

1981-2010 Average Annual Precipitation 19 inches  
NRCS Taxonomical soil Classification Loamy-skeletal, mixed Lithic Mollic Cryoboralfs  
NRCS Ecological Site Mountain Shallow Loam (Ponderosa Pine)  
NRCS Ecological Site # R047XB450UT

### SOIL ANALYSIS DATA--

Management unit 27, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	36.4	32.1	31.6	6.9	0.6	3.6	7.6	163.2	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has remained in a stable ponderosa pine (*Pinus ponderosa*) state. Antelope bitterbrush (*Purshia tridentata*) and dwarf rabbitbrush (*Chrysothamnus depressus*) have been the major component of the shrub layer (Table - Browse Trends). A diverse number of native species have made up the majority of the herbaceous understory, though no single species have dominated the community (Table - Herbaceous Trends).

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 27, Study no: 3

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
G	Agropyron dasystachyum	ab41	bc78	a21	c82	c91	.25	.33	.21	1.07	.52
G	Carex sp.	49	36	32	40	51	.64	.74	.37	.72	.85
G	Koeleria cristata	ab36	ab30	a14	ab20	b45	.42	.22	.12	.21	.83
G	Oryzopsis hymenoides	3	-	-	4	8	.01	-	-	.00	.12
G	Poa fendleriana	b164	a81	a73	a84	b137	3.20	.93	.70	1.18	2.92
G	Poa secunda	-	3	-	4	-	-	.00	-	.00	-
G	Sitanion hystrix	c31	ab9	bc23	a3	abc22	.14	.05	.13	.00	.29
G	Stipa comata	61	57	53	53	60	1.04	.61	.49	1.50	1.58
G	Stipa lettermani	c94	b56	ab53	ab50	a28	.93	.50	.40	1.11	.65
G	Stipa sp.	4	-	-	-	-	.03	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		483	350	269	340	442	6.68	3.42	2.43	5.83	7.77
Total for Grasses		483	350	269	340	442	6.68	3.42	2.43	5.83	7.77
F	Agoseris glauca	2	-	7	-	1	.01	-	.07	-	.00
F	Androsace septentrionalis (a)	a2	a-	b18	a3	ab9	.00	-	.03	.00	.01
F	Antennaria sp.	8	4	5	7	4	.03	.00	.01	.06	.15
F	Arabis demissa	ab16	b12	ab8	a-	b15	.04	.02	.02	-	.06
F	Arabis fendleri	a-	a-	a-	a-	b50	-	-	-	-	.84
F	Arabis pulchra	13	-	-	-	-	.02	-	-	-	-
F	Arenaria fendleri	c102	b68	b44	b51	a-	2.65	.48	.54	.51	-
F	Artemisia ludoviciana	4	-	4	-	-	.03	-	.15	-	-
F	Aster chilensis	b76	a32	a14	a19	a19	.51	.10	.11	.05	.14
F	Astragalus humistratus	6	-	-	-	4	.05	.00	-	-	.03
F	Calochortus nuttallii	ab1	a-	b7	ab2	ab1	.00	-	.02	.00	.00
F	Chenopodium leptophyllum(a)	-	-	-	-	-	-	-	-	.00	-
F	Cirsium sp.	1	1	1	-	-	.03	.03	.00	-	-
F	Cordylanthus sp. (a)	a-	a-	a-	a-	b15	-	-	-	-	.04
F	Crepis acuminata	4	4	3	3	-	.03	.01	.03	.03	-
F	Cryptantha sp.	1	-	3	7	8	.00	-	.00	.01	.06
F	Descurainia pinnata (a)	-	-	3	-	4	-	-	.00	-	.01
F	Erigeron flagellaris	b20	a1	a3	ab12	a2	.34	.00	.00	.12	.00
F	Erigeron pumilus	-	3	-	4	6	-	.00	-	.01	.01
F	Eriogonum racemosum	b38	ab30	a17	a18	ab28	.29	.15	.11	1.05	.20
F	Eriogonum umbellatum	3	-	-	-	-	.03	-	-	-	-
F	Hymenoxys richardsonii	-	-	-	-	-	.03	-	-	-	-
F	Ipomopsis aggregata	4	5	-	-	-	.01	.01	-	-	-
F	Lappula occidentalis (a)	a-	a-	b18	a3	a1	-	-	.49	.00	.00
F	Linum kingii	-	-	-	1	-	-	-	-	.00	-
F	Lychnis drummondii	1	-	-	-	-	.00	-	-	-	-
F	Oenothera sp.	-	-	-	-	-	-	-	-	-	.00
F	Orthocarpus luteus (a)	b21	ab4	a2	b16	a-	.09	.01	.01	.20	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
F	<i>Pedicularis centranthera</i>	-	-	9	8	1	-	-	.07	.20	.03
F	<i>Penstemon caespitosus</i>	7	3	-	7	7	.09	.00	.00	.04	.03
F	<i>Penstemon comarrhenus</i>	-	-	-	-	3	-	-	-	-	.00
F	<i>Penstemon sp.</i>	<sub>b</sub> 6	<sub>a</sub> 3	<sub>a</sub> 3	<sub>a</sub> 3	<sub>a</sub> -	.05	.03	.03	.03	-
F	<i>Petradoria pumila</i>	<sub>a</sub> 125	<sub>a</sub> 106	<sub>ab</sub> 145	<sub>b</sub> 162	<sub>ab</sub> 144	4.47	3.86	6.59	6.41	6.95
F	<i>Phlox longifolia</i>	<sub>b</sub> 15	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> 3	<sub>a</sub> -	.04	-	-	.00	-
F	<i>Polygonum douglasii</i> (a)	<sub>b</sub> 34	<sub>b</sub> 31	<sub>a</sub> 9	<sub>a</sub> 2	<sub>a</sub> 5	.07	.11	.02	.01	.00
F	<i>Potentilla crinita</i>	<sub>b</sub> 16	<sub>a</sub> -	<sub>a</sub> 1	<sub>a</sub> -	<sub>a</sub> 4	.19	-	.00	-	.03
F	<i>Senecio multilobatus</i>	-	-	1	-	-	-	-	.00	-	-
F	<i>Taraxacum officinale</i>	-	1	-	-	-	-	.00	-	-	-
F	<i>Tragopogon dubius</i> (a)	-	-	-	2	-	-	-	-	.00	-
F	Unknown forb-perennial	-	-	1	-	-	-	-	.00	-	-
Total for Annual Forbs		57	35	50	26	34	0.17	0.12	0.56	0.23	0.07
Total for Perennial Forbs		469	273	276	307	297	8.99	4.74	7.80	8.55	8.58
Total for Forbs		526	308	326	333	331	9.16	4.87	8.37	8.79	8.66

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

BROWSE TRENDS--

Management unit 27, Study no: 3

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	<i>Artemisia nova</i>	2.04	1.16	1.49	.76	.88	1.96	1.15	1.31
B	<i>Ceanothus fendleri</i>	-	-	-	-	.15	-	-	-
B	<i>Chrysothamnus depressus</i>	8.32	7.23	7.58	5.68	5.00	6.95	9.53	8.36
B	<i>Chrysothamnus parryi attenuatus</i>	.41	.03	.64	.63	1.34	.38	.68	.18
B	<i>Gutierrezia sarothrae</i>	.04	-	.01	.43	.03	.03	.41	.23
B	<i>Mahonia repens</i>	.04	.00	-	-	-	-	-	-
B	<i>Pinus ponderosa</i>	11.14	2.20	6.71	.76	.63	16.96	23.00	17.90
B	<i>Purshia tridentata</i>	5.21	2.91	2.90	3.98	3.67	3.21	6.30	5.33
B	<i>Ribes cereum inebrians</i>	-	-	.15	.15	.15	.68	.56	.36
B	<i>Symphoricarpos oreophilus</i>	.85	.81	.63	.38	.63	.16	.53	.43
B	<i>Tetradymia canescens</i>	.24	.06	.24	.19	.06	.10	.13	.18
Total for Browse		28.31	14.41	20.36	12.98	12.57	30.43	42.29	34.28

POINT-QUARTER TREE DATA--

Management unit 27, Study no: 3

Species	Trees per Acre		
	'03	'08	'13
<i>Pinus ponderosa</i>	50	60	55

Average diameter (in)		
'03	'08	'13
9.6	11.1	9.1



**BASIC COVER--**

Management unit 27, Study no: 3

Cover Type	Average Cover %				
	'92	'97	'03	'08	'13
Vegetation	42.34	29.83	28.45	28.42	29.19
Rock	12.57	8.37	10.08	7.85	7.05
Pavement	0	4.80	.56	2.92	2.33
Litter	49.28	47.95	51.08	59.22	55.66
Cryptogams	.99	1.81	.03	.05	.21
Bare Ground	20.98	17.22	21.93	15.10	20.57

**PELLET GROUP DATA--**

Management unit 27, Study no: 3

Type	Quadrat Frequency					Days use per acre (ha)		
	'92	'97	'03	'08	'13	'03	'08	'13
Rabbit	6	-	3	14	-	-	-	-
Elk	3	8	9	6	2	12 (30)	29 (72)	1 (2)
Deer	6	7	7	19	2	24 (60)	26 (65)	13 (33)
Cattle	-	-	-	2	-	-	1 (2)	2 (5)

**BROWSE CHARACTERISTICS--**

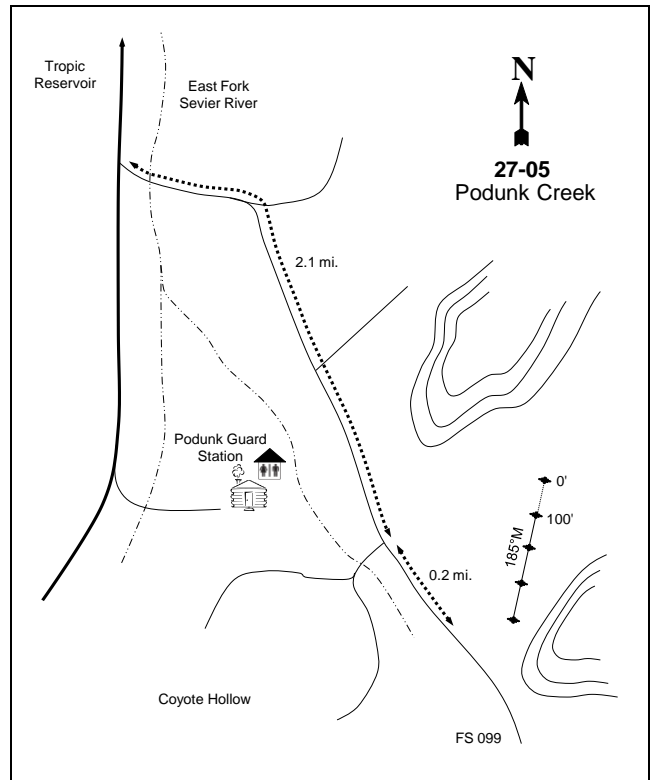
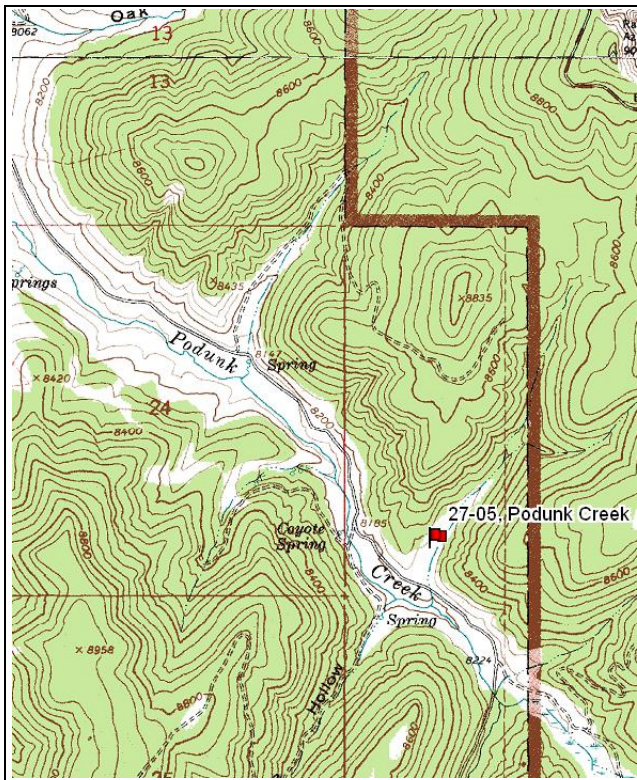
Management unit 27, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia nova</b>									
92	<b>2020</b>	26	36	39	1060	44	3	19	-/-
97	<b>1380</b>	10	71	19	-	0	0	13	13/25
03	<b>1340</b>	7	76	16	-	1	0	7	14/18
08	<b>1760</b>	25	32	43	120	0	0	16	12/18
13	<b>800</b>	0	95	5	200	18	3	5	9/16
<b>Ceanothus fendleri</b>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
97	<b>0</b>	0	0	-	-	0	0	0	10/48
03	<b>20</b>	0	100	-	-	0	0	0	7/24
08	<b>0</b>	0	0	-	-	0	0	0	6/7
13	<b>200</b>	30	70	-	-	10	0	0	11/16
<b>Chrysothamnus depressus</b>									
92	<b>21840</b>	15	78	7	780	15	2	4	-/-
97	<b>13380</b>	6	92	2	40	.14	0	1	5/13
03	<b>14980</b>	3	91	6	-	10	10	2	5/9
08	<b>11160</b>	3	82	16	140	43	8	3	4/10
13	<b>7120</b>	3	97	0	-	17	.28	0	5/10

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus parryi attenuatus</b>									
92	1460	34	30	36	40	29	15	8	-/-
97	80	25	50	25	-	0	0	0	7/10
03	1220	3	92	5	-	8	10	5	7/11
08	1160	0	98	2	-	5	0	0	7/13
13	3140	12	87	1	-	10	0	.63	6/11
<b>Gutierrezia sarothrae</b>									
92	380	5	95	0	40	5	0	5	-/-
97	60	67	33	0	-	0	0	0	-/-
03	400	80	20	0	-	0	0	0	5/5
08	1240	2	68	31	80	0	0	2	6/8
13	700	23	77	0	180	0	0	0	7/11
<b>Mahonia repens</b>									
92	280	93	7	-	140	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	4/5
08	40	0	100	-	-	0	0	0	4/6
13	0	0	0	-	40	0	0	0	4/6
<b>Pinus ponderosa</b>									
92	120	33	67	-	20	0	0	0	-/-
97	80	25	75	-	-	0	0	0	-/-
03	80	25	75	-	-	0	0	0	-/-
08	100	0	100	-	-	0	0	0	-/-
13	100	0	100	-	-	0	0	0	-/-
<b>Purshia tridentata</b>									
92	1820	45	45	10	140	38	19	4	-/-
97	620	13	71	16	40	52	6	0	14/41
03	720	3	58	39	-	36	61	0	16/38
08	820	5	78	17	20	24	2	0	15/39
13	720	3	89	8	20	58	11	25	17/40
<b>Ribes cereum inebrians</b>									
92	160	63	25	13	20	75	0	0	-/-
97	20	0	100	0	-	0	0	0	39/57
03	20	0	100	0	-	100	0	0	45/58
08	20	0	0	100	-	0	0	0	38/49
13	60	0	100	0	-	0	0	0	24/32
<b>Symphoricarpos oreophilus</b>									
92	300	53	40	7	20	13	40	0	-/-
97	240	25	75	0	-	8	0	0	17/41
03	300	20	80	0	-	33	27	0	13/25
08	320	6	88	6	-	63	0	0	10/30
13	220	18	82	0	-	45	18	0	11/30

		Age class distribution						Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)		
Tetradymia canescens											
92	<b>540</b>	44	33	22	20	22	4	0	-/-		
97	<b>200</b>	30	70	0	-	0	0	0	7/8		
03	<b>420</b>	19	81	0	-	0	0	0	9/11		
08	<b>340</b>	18	76	6	20	6	0	6	7/10		
13	<b>260</b>	31	69	0	-	8	0	0	10/13		

PODUNK CREEK - TREND STUDY NO. 27-5



**Location Information**

USGS 7.5 min Map Info Podunk Creek; Township 38S, Range 4W, Section 19  
 GPS (0' Stake) NAD 83, UTM Zone 12, 387735 East 4148957 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 185° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

Travel about 7.0 miles south from Tropic Reservoir on the East Fork of the Sevier River Road to a major fork. Turn left towards Podunk Creek and the park boundary. Travel 2.1 miles SE on the main road up Podunk Creek to a fork at Coyote Hollow. Stay left on USFS road #099 and continue about 0.2 miles to a point in the middle of the valley to the north. The transect is in the bottom of this seeded meadow valley. The end of the baseline can be found 125 feet north of the road. The study is marked by short fenceposts. The 0-foot baseline stake is 375 feet north of the end stake as the study runs from there back to the southwest.

### Site Information

Land Ownership USFS  
Allotment East Fork/Crawford  
Elevation 8,220ft (2,505m)  
Aspect South  
Slope 5%  
Sample Dates 09/06/1987, 08/11/1992, 07/30/1997, 07/28/2003, 07/16/2008, 07/31/2013

### DISTURBANCE HISTORY--

Management unit 27, Study no: 5

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Terrace	-	-	1960's	-
Seeding	-	-	1960's	-

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer; Elk, Crucial Summer, Calving

### VEGETATION HISTORY--

Management unit 27, Study no: 5

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>
1987-2013	Perennial Grass

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

### Site Notes

Due to serious erosion and gully formation caused by overgrazing in the early part of the areas grazing history, watershed rehabilitation treatments were undertaken in the 1960's all along the East Fork of the Sevier River drainage. The treatment here successfully established a dense stand of perennial grasses, stopped overland flows and erosion, and helped heal the adjacent gully. Erosion is now almost non-existent due to the contoured trenching treatment and the dense grass and litter cover.

### Site Potential

1981-2010 Average Annual Precipitation 24 inches  
NRCS Taxonomical soil Classification Loamy-skeletal, mixed Typic Cryochrepts  
NRCS Ecological Site High Mountain Loam (Mountain Big Sagebrush)  
NRCS Ecological Site # R047XB516UT

### SOIL ANALYSIS DATA--

Management unit 22, Study no: 1

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Clay Loam	31.7	37.7	30.6	7.2	0.7	4.1	24.5	332.8	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [High Mountain Loam \(Mountain Big Sagebrush\), R047XA516UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1987, the site has been in a stable state with seeded introduced grass species being the major component of the study area (Appendix B -Pre-1992 Data). Shrubs have been sparse over the sample

years, though rabbitbrush species (*Chrysothamnus spp.*) have increased on the site (Table – Browse Trends). The herbaceous understory has been dominated by introduced perennial grass species (Table – Herbaceous Trends). Due to the lack of seed source of mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*), the site may remain in this current state without treatment (USDA-NRCS, 2011).

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 27, Study no: 5

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
G	<i>Agropyron intermedium</i>	-	-	-	4	2	-	-	-	.06	.00
G	<i>Bouteloua gracilis</i>	a-	a-	a-	a-	b80	-	-	-	-	1.79
G	<i>Bromus inermis</i>	439	448	428	442	452	31.07	22.11	21.78	30.26	24.81
G	<i>Koeleria cristata</i>	b17	a-	a-	a-	b17	.27	-	-	-	.22
G	<i>Muhlenbergia montana</i>	b80	b92	a7	b71	a-	1.50	1.56	.06	1.66	-
G	<i>Poa fendleriana</i>	ab2	a-	ab6	b18	ab2	.15	-	.03	.10	.00
G	<i>Poa pratensis</i>	c298	ab47	a17	ab43	b64	7.19	.22	.07	.26	.79
G	<i>Poa secunda</i>	-	-	1	13	5	-	-	.00	.01	.03
G	<i>Stipa columbiana</i>	3	3	-	-	-	.03	.00	-	-	-
G	<i>Stipa lettermani</i>	c203	c192	a89	a114	b166	4.14	1.66	1.06	2.32	2.11
Total for Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		1042	782	548	705	788	44.36	25.55	23.01	34.68	29.77
Total for Grasses		1042	782	548	705	788	44.36	25.55	23.01	34.68	29.77
F	<i>Androsace septentrionalis</i> (a)	bc26	a-	c35	b13	a4	.11	-	.10	.02	.01
F	<i>Antennaria sp.</i>	ab10	a7	ab4	b15	ab10	.56	.30	.18	1.43	.78
F	<i>Artemisia dracunculoides</i>	-	8	-	1	2	-	.36	-	.00	.15
F	<i>Aster occidentalis</i>	a-	c143	b41	c119	c131	-	1.39	.21	2.14	3.43
F	<i>Astragalus convallarius</i>	b192	a1	a-	a-	a-	3.02	.00	-	-	-
F	<i>Astragalus humistratus</i>	-	-	6	-	4	-	-	.06	-	.03
F	<i>Astragalus sp.</i>	-	-	-	-	-	.00	-	-	-	-
F	<i>Calochortus nuttallii</i>	-	-	-	2	-	-	-	-	.00	-
F	<i>Castilleja linariaefolia</i>	-	3	-	-	-	-	.00	-	-	-
F	<i>Equisetum laevigatum</i>	-	-	-	-	3	-	-	-	-	.03
F	<i>Erigeron flagellaris</i>	cd216	a59	d253	b152	bc188	4.52	.65	5.21	2.75	4.01
F	<i>Erigeron sp.</i>	a-	b19	a-	a-	a-	-	.11	-	-	-
F	<i>Eriogonum alatum</i>	-	-	-	3	-	-	-	-	.00	-
F	<i>Eriogonum racemosum</i>	ab19	b31	a10	ab16	ab21	.75	.64	.22	.22	.32
F	<i>Hymenoxys richardsonii</i>	6	-	-	2	3	.09	-	-	.00	.00
F	<i>Polygonum douglasii</i> (a)	a-	a5	a-	b29	a5	-	.02	-	.06	.01
F	<i>Polygonum sp.</i>	b15	a-	a-	a-	a-	.03	-	-	-	-
F	<i>Potentilla gracilis</i>	ab97	b59	a17	ab26	a14	6.47	2.15	.46	1.34	.68
F	<i>Potentilla hippiana</i>	a-	a-	ab49	b30	c65	-	-	1.24	1.45	2.89
F	<i>Senecio douglasii</i>	-	-	-	7	-	-	-	-	.04	-
F	<i>Senecio spartioides</i>	5	-	-	-	-	.01	-	-	-	-
F	<i>Tragopogon dubius</i> (a)	7	-	10	1	4	.09	-	.02	.00	.00
F	<i>Vicia americana</i>	2	-	-	-	-	.00	-	-	-	-

Type	Species	Nestled Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
	Total for Annual Forbs	33	5	45	43	13	0.20	0.02	0.12	0.09	0.03
	Total for Perennial Forbs	562	330	380	373	441	15.47	5.63	7.60	9.42	12.35
	Total for Forbs	595	335	425	416	454	15.67	5.65	7.72	9.51	12.38

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

#### BROWSE TRENDS--

Management unit 27, Study no: 5

Type	Species	Average Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13			
B	Chrysothamnus parryi	.78	1.24	-	.31	.56	-	.88	.46
B	Chrysothamnus viscidiflorus lanceolatus	1.75	3.19	.78	2.43	2.75	1.20	2.83	2.41
B	Chrysothamnus viscidiflorus viscidiflorus	.18	.30	.03	-	-	.33	-	-
B	Gutierrezia sarothrae	-	.15	-	-	-	-	-	-
	Total for Browse	2.71	4.88	0.81	2.74	3.31	1.53	3.71	2.87

#### BASIC COVER--

Management unit 27, Study no: 5

Cover Type	Average Cover %				
	'92	'97	'03	'08	'13
Vegetation	53.48	39.05	32.59	48.92	46.97
Rock	5.68	.96	3.80	1.10	.98
Pavement	0	4.96	5.92	3.87	1.36
Litter	28.00	39.34	34.06	40.96	33.84
Cryptogams	.00	0	0	0	0
Bare Ground	27.11	22.03	33.68	17.53	36.19

#### PELLET GROUP DATA--

Management unit 27, Study no: 5

Type	Quadrat Frequency				
	'92	'97	'03	'08	'13
Rabbit	-	-	-	4	-
Elk	-	3	-	2	1
Deer	3	4	-	2	1
Cattle	6	23	32	36	29

Days use per acre (ha)		
'03	'08	'13
-	-	-
4 (10)	11 (26)	-
-	3 (7)	1 (2)
72 (177)	36 (90)	40 (99)

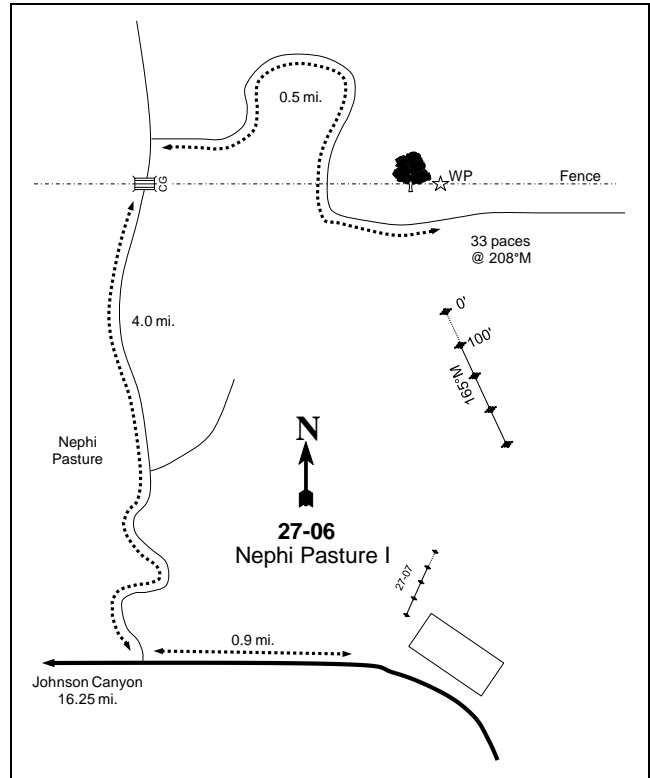
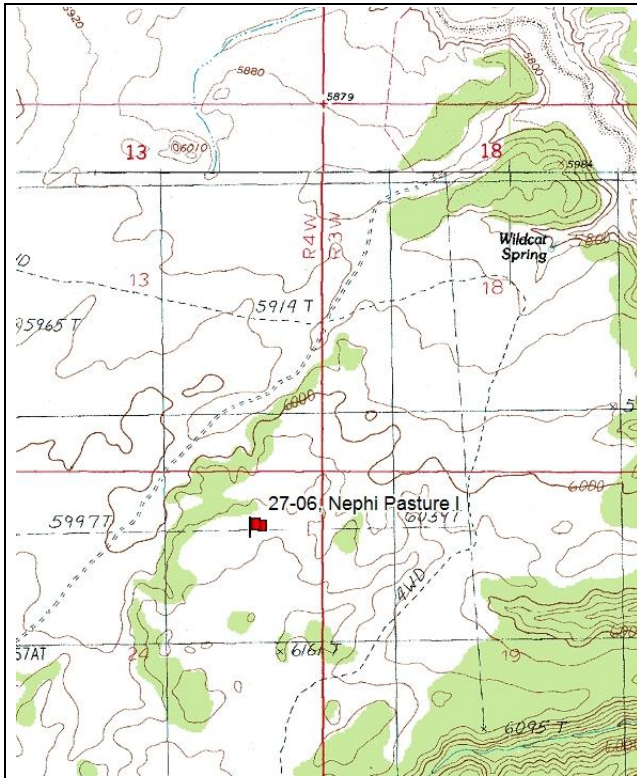
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 5

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus parryi</b>										
92	<b>120</b>	33	33	33	-	33	0	0	-/-	
97	<b>480</b>	58	42	0	-	0	0	0	17/19	
03	<b>200</b>	0	80	20	-	40	0	20	14/18	
08	<b>260</b>	8	62	31	-	0	0	0	17/22	
13	<b>240</b>	25	58	17	-	33	8	0	19/24	
<b>Chrysothamnus viscidiflorus lanceolatus</b>										
92	<b>2860</b>	15	76	8	-	0	0	3	-/-	
97	<b>4060</b>	0	100	0	-	0	0	0	6/13	
03	<b>1180</b>	0	76	24	-	0	0	0	9/14	
08	<b>2840</b>	4	96	0	180	8	.70	0	8/15	
13	<b>3340</b>	26	74	0	20	0	1	1	7/14	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
92	<b>340</b>	12	53	35	-	18	0	0	-/-	
97	<b>80</b>	50	50	0	-	0	0	0	10/11	
03	<b>100</b>	0	100	0	-	0	40	0	13/17	
08	<b>0</b>	0	0	0	-	0	0	0	-/-	
13	<b>0</b>	0	0	0	-	0	0	0	-/-	
<b>Eriogonum microthecum</b>										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
97	<b>0</b>	0	0	-	-	0	0	0	17/18	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<b>Gutierrezia sarothrae</b>										
92	<b>20</b>	0	100	0	-	0	0	0	-/-	
97	<b>20</b>	0	100	0	-	0	0	0	15/20	
03	<b>60</b>	0	33	67	-	0	0	0	4/4	
08	<b>0</b>	0	0	0	-	0	0	0	-/-	
13	<b>40</b>	0	100	0	-	0	0	0	-/-	



NEPHI PASTURE I - TREND STUDY NO. 27-6



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Nephi Point; Township 41S, Range 4W, Section 24  
NAD 83, UTM Zone 12, 395313 East 4121659 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
165° magnetic  
400ft  
Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
Standard

**Directions to Site**

From Kanab, take US 89 east for 9.4 miles to the Johnson Canyon turnoff. Turn left and travel up Johnson Canyon 9.75 miles to the Lock Ridge-Nephi Pasture road. Turn right. Go 3.6 miles to a cattleguard. Go another 0.8 miles to a fork, and bear right (There are lots of forks, stay on main Nephi Pasture road). Go 1.25 miles to a fork, and keep right. Go 0.85 miles to a fork by a cattleguard, continue straight. Continue 1.2 miles to a cattleguard. Continue 4.7 miles to a fork, bear right. Go 0.7 miles to a cattleguard, and continue 2.8 miles to an intersection. Turn left (straight goes to Nephi Point and the Nephi Pasture enclosure) and follow this road 4.0 miles to a cattleguard. Turn right and follow the road up the fence 0.5 miles to a yellow-painted wood post marking the pellet group transect and range trend study. The 0-foot baseline stake is 33 paces at 208 degrees magnetic south of the yellow post. The trend study is marked by short fenceposts, and runs south along the pellet group transect.

### Site Information

Land Ownership BLM  
Allotment Vermilion  
Elevation 6,100ft (1,859m)  
Aspect Northwest  
Slope 5-10%  
Sample Dates 09/07/1987, 08/15/1992, 08/06/1997, 07/30/2003, 07/29/2008, 07/23/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Substantial Winter

#### VEGETATION HISTORY--

Management unit 27, Study no: 6

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2003	Mixed Mountain Brush	Phase I
2008-2013	Mixed Mountain Brush/Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Most of the area below the White Cliffs consists of either sagebrush-grass or pinyon-juniper (*Pinus edulis* and *Juniperus osteosperma*) woodland communities. Water is limited in this area during the summer.

### Site Potential

1981-2010 Average Annual Precipitation 11 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site [Upland Sand \(Mountain Big Sagebrush\)](#)  
NRCS Ecological Site # R035XY307UT

#### SOIL ANALYSIS DATA--

Management unit 27, Study no: 6

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loamy Sand	88.4	4.1	7.5	6.5	0.3	0.6	13.0	57.6	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

#### States and Transitions

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has been a mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), Utah serviceberry (*Amelanchier utahensis*), and antelope bitterbrush (*Purshia tridentata*) with a sparse herbaceous understory dominated by sandhill muhley (*Muhlenbergia pungens*) (Appendix B -Pre-1992 Data, Table - Browse Trends, Table - Herbaceous Trends). Utah juniper trees have increased on the site over the sample years (Table - Browse Trends, Table - Browse Characteristics). It is predicted that without disturbance, juniper will likely become dominant on the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 27, study no: 6

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	30.0	2.2	9.5	10.4	0.0	1.1	0.0	<b>53.2</b>	Fair
1997	25.0	4.5	5.3	8.3	-1.0	2.7	0.0	<b>44.8</b>	Poor
2003	24.6	-5.4	0.0	1.4	0.0	4.7	0.0	<b>25.3</b>	Very Poor
2008	24.4	1.7	7.6	2.3	0.0	1.6	0.0	<b>37.6</b>	Poor
2013	27.2	7.7	11.8	5.7	-0.2	2.6	0.0	<b>54.9</b>	Fair

## HERBACEOUS TRENDS--

Management unit 27, Study no: 6

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
G	<i>Agropyron dasystachyum</i>	-	-	-	-	7	-	-	-	-	.15
G	<i>Bouteloua gracilis</i>	-	4	-	-	-	-	.03	-	-	
G	<i>Muhlenbergia pungens</i>	b <sub>95</sub>	b <sub>113</sub>	a <sub>33</sub>	a <sub>31</sub>	ab <sub>48</sub>	3.97	3.78	.59	1.14	2.17
G	<i>Oryzopsis hymenoides</i>	ab <sub>11</sub>	b <sub>10</sub>	a <sup>-</sup>	ab <sub>3</sub>	ab <sub>10</sub>	.15	.10	-	.00	.21
G	<i>Poa fendleriana</i>	-	-	-	-	9	-	-	-	-	.04
G	<i>Poa secunda</i>	2	-	-	-	1	.03	-	-	-	.15
G	<i>Sitanion hystrix</i>	b <sub>18</sub>	b <sub>24</sub>	a <sub>3</sub>	a <sup>-</sup>	a <sub>1</sub>	.63	.16	.03	-	.03
G	<i>Sporobolus cryptandrus</i>	10	9	6	4	9	.42	.07	.06	.01	.08
G	<i>Stipa comata</i>	-	-	-	-	-	-	-	-	-	.00
G	<i>Vulpia octoflora</i> (a)	a <sub>14</sub>	d <sub>192</sub>	a <sup>-</sup>	b <sub>16</sub>	c <sub>45</sub>	.02	1.30	-	.06	.20
Total for Annual Grasses		14	192	0	16	45	0.02	1.30	0	0.06	0.20
Total for Perennial Grasses		136	160	42	38	85	5.20	4.15	0.69	1.16	2.85
Total for Grasses		150	352	42	54	130	5.22	5.45	0.69	1.22	3.05
F	<i>Calochortus nuttallii</i>	-	7	-	-	-	-	.01	-	-	-
F	<i>Comandra pallida</i>	19	50	42	28	45	.16	.85	.84	.11	.89
F	<i>Delphinium nuttallianum</i>	-	2	-	-	-	-	.03	-	-	-
F	<i>Descurainia pinnata</i> (a)	a <sub>5</sub>	c <sub>48</sub>	a <sup>-</sup>	c <sub>73</sub>	b <sub>15</sub>	.01	.35	-	.32	.11
F	<i>Eriogonum cernuum</i> (a)	c <sub>75</sub>	b <sub>16</sub>	a <sup>-</sup>	c <sub>74</sub>	a <sub>1</sub>	.23	.03	-	.13	.00
F	<i>Gilia</i> sp. (a)	-	9	-	-	-	-	.02	-	-	-
F	<i>Lappula occidentalis</i> (a)	-	3	-	-	6	-	.03	-	-	.03
F	<i>Lathyrus brachycalyx</i>	b <sub>77</sub>	ab <sub>61</sub>	a <sub>40</sub>	ab <sub>51</sub>	a <sub>45</sub>	.38	.47	1.50	.67	.38
F	<i>Navarretia intertexta</i> (a)	-	-	-	3	-	-	-	-	.00	-
F	<i>Penstemon</i> sp.	-	-	-	-	1	-	-	-	-	.03
F	<i>Plantago patagonica</i> (a)	-	-	-	-	4	-	-	-	-	.01
F	<i>Ranunculus testiculatus</i> (a)	-	-	-	3	-	-	-	-	.00	-
F	<i>Sphaeralcea parvifolia</i>	3	-	-	-	4	.01	-	-	-	.01
F	<i>Townsendia</i> sp.	1	-	-	-	-	.00	-	-	-	-
Total for Annual Forbs		80	76	0	153	26	0.24	0.43	0	0.46	0.16
Total for Perennial Forbs		100	120	82	79	95	0.55	1.37	2.34	0.79	1.32

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
Total for Forbs		180	196	82	232	121	0.79	1.81	2.34	1.26	1.48

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

#### BROWSE TRENDS--

Management unit 27, Study no: 6

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	3.50	2.25	2.64	4.56	6.24	7.98	8.45	11.98
B	Artemisia tridentata tridentata	19.74	14.50	13.35	9.27	8.82	7.31	8.86	7.88
B	Ephedra viridis	-	-	-	-	-	-	.10	-
B	Gutierrezia sarothrae	1.37	1.79	.09	.07	.45	.13	-	.95
B	Juniperus osteosperma	.98	.63	.82	2.49	2.99	1.36	3.73	7.01
B	Opuntia sp.	-	-	-	.03	-	-	-	.05
B	Purshia tridentata	2.87	2.33	2.65	3.98	4.54	5.75	6.20	8.00
Total for Browse		28.48	21.52	19.57	20.40	23.04	22.53	27.34	35.87

#### BASIC COVER--

Management unit 27, Study no: 6

Cover Type	Average Cover %				
	'92	'97	'03	'08	'13
Vegetation	33.87	29.81	21.84	23.17	27.98
Rock	1.14	.27	.59	.25	.20
Pavement	0	.73	.88	.31	.13
Litter	48.39	43.55	47.33	53.90	45.42
Cryptogams	1.53	1.53	.18	.20	.80
Bare Ground	39.89	34.83	43.46	40.65	42.49

#### PELLET GROUP DATA--

Management unit 27, Study no: 6

Type	Quadrat Frequency				
	'92	'97	'03	'08	'13
Rabbit	48	27	17	73	28
Elk	-	-	-	-	1
Deer	30	49	21	24	13
Cattle	-	1	2	3	1

Days use per acre (ha)		
'03	'08	'13
-	-	-
-	-	-
72 (177)	43 (106)	21 (51)
9 (22)	3 (7)	12 (29)

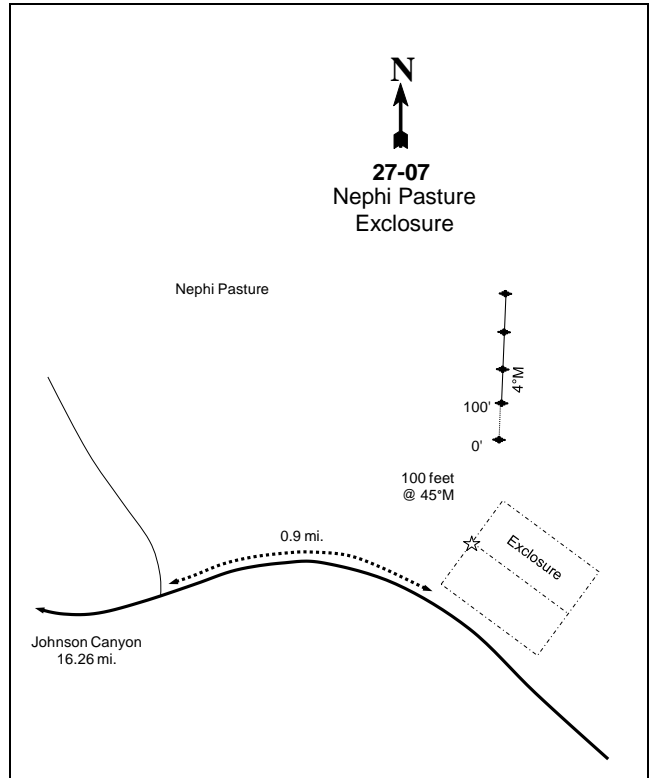
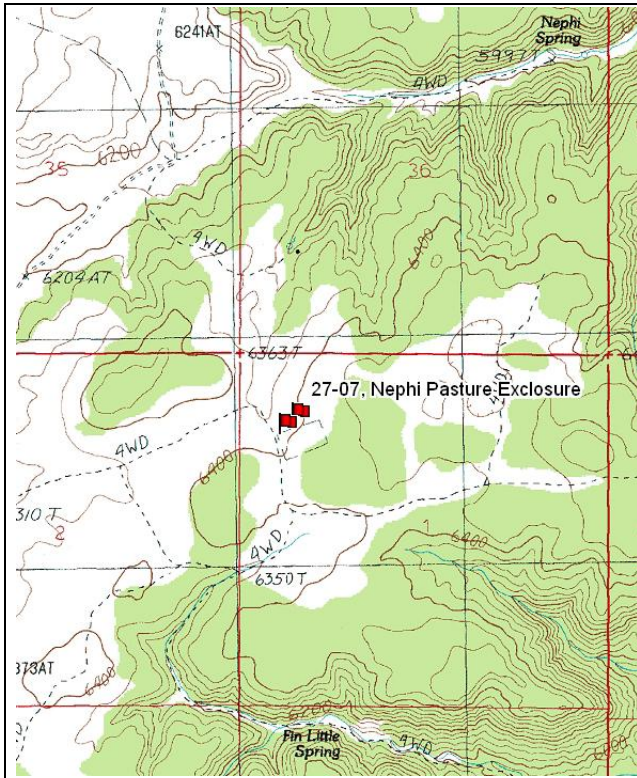
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 6

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
92	500	88	8	4	40	8	0	36	-/-	
97	300	67	33	0	-	7	0	0	95/111	
03	100	0	100	0	-	0	20	0	86/80	
08	540	48	48	4	-	0	4	0	100/111	
13	260	54	46	0	140	46	0	0	90/135	
<i>Artemisia tridentata tridentata</i>										
92	3000	8	41	51	20	31	.66	8	-/-	
97	2100	3	57	40	40	18	7	32	39/47	
03	1620	0	9	91	-	15	2	47	36/39	
08	1200	0	25	75	20	25	20	52	44/49	
13	1040	10	37	54	-	46	12	42	37/52	
<i>Ceratoides lanata</i>										
92	0	0	0	-	-	0	0	0	-/-	
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	13/13	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Ephedra viridis</i>										
92	0	0	0	-	-	0	0	0	-/-	
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	40/46	
08	20	0	100	-	-	100	0	0	55/67	
13	20	0	100	-	-	0	0	0	49/53	
<i>Gutierrezia sarothrae</i>										
92	1480	15	82	3	340	3	1	0	-/-	
97	3500	3	97	0	-	0	0	0	11/10	
03	320	0	100	0	-	0	0	0	7/9	
08	40	50	50	0	-	0	0	0	4/5	
13	1000	36	64	0	200	0	0	0	10/13	
<i>Juniperus osteosperma</i>										
92	40	50	50	-	-	0	0	0	-/-	
97	40	0	100	-	-	0	0	0	-/-	
03	40	0	100	-	-	0	0	0	-/-	
08	60	0	100	-	-	0	0	0	-/-	
13	40	0	100	-	-	0	0	0	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Opuntia</i> sp.										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
97	<b>40</b>	50	50	-	-	0	0	0	3/7	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>20</b>	0	100	-	-	0	0	0	2/3	
13	<b>20</b>	0	100	-	-	0	0	0	4/12	
<i>Purshia tridentata</i>										
92	<b>540</b>	11	56	33	340	52	19	4	-/-	
97	<b>460</b>	4	57	39	-	52	26	17	30/49	
03	<b>620</b>	0	81	19	-	32	68	6	33/49	
08	<b>620</b>	13	68	19	-	19	3	3	34/57	
13	<b>740</b>	8	86	5	-	59	5	22	34/67	
<i>Yucca</i> sp.										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
97	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	59/74	
08	<b>0</b>	0	0	-	-	0	0	0	53/44	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

NEPHI PASTURE EXCLOSURE OUTSIDE - TREND STUDY NO. 27-7



**Location Information**

USGS 7.5 min Map Info      Nephi Point; Township 42S, Range 4W, Section 1  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 394191 East 4116824 North

**Transect Information**

Browse Tag # (0' Stake)      7808  
 Transect Bearing              4° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement        Standard

**Directions to Site**

From Kanab, take US 89 east for 9.4 miles to Johnson Canyon. Travel north up Johnson Canyon 9.75 miles to the Lock Ridge-Nephi Pasture road. Turn right. Go 16.25 miles (see 27-6-03 for more detail) on the main road to a major intersection in Nephi Pasture. Continue straight towards Nephi Point, going 0.9 miles to an exclosure. Walk east along the fence on the north side of the exclosure to the inner fence. From the northeast corner of the tallest fence, walk 100 feet northeast to the 0-foot baseline stake, a cut fencepost tagged #7808.

**Site Information**

Land Ownership BLM  
 Allotment Vermilion  
 Elevation 6,400ft (1,951m)  
 Aspect Northwest  
 Slope 5%  
 Sample Dates 09/07/1987, 08/15/1992, 08/06/1997, 08/12/1998, 07/30/2003, 07/29/2008, 07/23/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

VEGETATION HISTORY--

Management unit 27, Study no: 7

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This transect was established to sample the outside of an enclosure in conjunction with two other studies that were established inside the enclosure. One in a total enclosure (27R-4) and the other in a livestock enclosure (27R-5). They are part of a three-way comparison between the different enclosure grazing treatments. On this study, the sagebrush was identified during the readings as basin big sagebrush, not mountain big sagebrush, because of size and growth form. A few deer shed antlers were found east of the enclosure in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Sand \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R035XY307UT

SOIL ANALYSIS DATA--

Management unit 27, Study no: 7

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loamy Sand	87.0	7.4	5.6	5.9	0.2	0.7	11.9	38.4	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has been a mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), Utah serviceberry (*Amelanchier utahensis*), and antelope bitterbrush (*Purshia tridentata*) with a limited herbaceous understory (Appendix - Pre -1992 Data) (Table - Browse Trends, Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have slowly increased on the site over the sample years (Table - Point-Quarter Tree Data). It is predicted that pinyon and juniper will continue to increase on the site, and without disturbance will likely become dominant on the study site.



## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 27, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	30.0	8.3	15.0	3.9	-0.1	2.2	0.0	<b>59.3</b>	Fair
1997	29.1	9.2	9.5	3.6	-2.0	4.3	0.0	<b>53.6</b>	Fair
1998	20.4	9.0	7.9	3.9	-3.8	3.4	0.0	<b>40.8</b>	Poor
2003	26.6	3.7	4.1	0.8	0.0	3.1	0.0	<b>38.4</b>	Poor
2008	25.6	3.3	4.1	0.1	0.0	6.0	0.0	<b>38.9</b>	Poor
2013	29.2	12.0	10.4	0.7	0.0	6.9	0.0	<b>59.3</b>	Fair

## HERBACEOUS TRENDS--

Management unit 27, Study no: 7

Type	Species	Nested Frequency						Average Cover %					
		'92	'97	'98	'03	'08	'13	'92	'97	'98	'03	'08	'13
G	Agropyron smithii	a <sup>4</sup>	b <sup>52</sup>	b <sup>75</sup>	a <sup>10</sup>	a <sup>2</sup>	a <sup>-</sup>	.03	.29	.50	.07	.01	-
G	Agropyron spicatum	-	-	-	-	-	3	-	-	-	-	-	.03
G	Bromus tectorum (a)	a <sup>3</sup>	b <sup>129</sup>	c <sup>167</sup>	a <sup>-</sup>	a <sup>6</sup>	a <sup>1</sup>	.00	2.35	3.21	-	.01	.00
G	Oryzopsis hymenoides	b <sup>26</sup>	ab <sup>21</sup>	ab <sup>15</sup>	ab <sup>16</sup>	a <sup>2</sup>	ab <sup>6</sup>	.34	.10	.25	.21	.01	.15
G	Poa secunda	b <sup>12</sup>	b <sup>17</sup>	b <sup>17</sup>	ab <sup>3</sup>	a <sup>-</sup>	ab <sup>2</sup>	.10	.39	.10	.01	-	.03
G	Sitanion hystrix	b <sup>60</sup>	b <sup>68</sup>	b <sup>42</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>4</sup>	.51	.83	.62	-	-	.06
G	Sporobolus cryptandrus	bc <sup>34</sup>	ab <sup>14</sup>	c <sup>32</sup>	a <sup>10</sup>	a <sup>5</sup>	a <sup>12</sup>	.63	.06	.33	.07	.01	.07
G	Stipa comata	c <sup>24</sup>	bc <sup>26</sup>	bc <sup>23</sup>	ab <sup>7</sup>	a <sup>-</sup>	a <sup>3</sup>	.32	.14	.16	.03	.00	.00
G	Vulpia octoflora (a)	b <sup>28</sup>	c <sup>82</sup>	d <sup>165</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.11	.33	1.92	-	-	-
Total for Annual Grasses		31	211	332	0	6	1	0.11	2.69	5.13	0	0.01	0.00
Total for Perennial Grasses		160	198	204	46	9	30	1.94	1.82	1.97	0.41	0.03	0.36
Total for Grasses		191	409	536	46	15	31	2.06	4.51	7.10	0.41	0.04	0.36
F	Arabis sp.	-	6	3	-	-	-	-	.04	.01	-	-	-
F	Astragalus sp.	2	1	1	3	-	-	.00	.00	.00	.00	-	-
F	Calochortus nuttallii	-	1	-	4	-	-	-	.01	-	.01	-	-
F	Chaenactis douglasii	2	1	11	-	-	-	.01	.00	.19	-	-	-
F	Chenopodium leptophyllum(a)	-	-	-	-	-	3	-	-	-	-	-	.01
F	Collinsia parviflora (a)	-	1	-	2	1	-	-	.15	-	.03	.00	-
F	Collomia linearis (a)	-	3	-	-	-	-	-	.00	-	-	-	-
F	Comandra pallida	a <sup>61</sup>	bc <sup>125</sup>	ab <sup>103</sup>	ab <sup>95</sup>	ab <sup>112</sup>	c <sup>166</sup>	.50	1.79	1.04	1.42	2.88	2.59
F	Delphinium nuttallianum	-	3	-	-	-	-	-	.00	-	-	-	-
F	Descurainia sp. (a)	b <sup>17</sup>	b <sup>31</sup>	b <sup>28</sup>	a <sup>-</sup>	b <sup>45</sup>	b <sup>22</sup>	.40	.12	.13	-	.23	.10
F	Draba sp. (a)	b <sup>17</sup>	a <sup>-</sup>	ab <sup>9</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.03	-	.04	-	-	-
F	Erigeron sp.	-	1	4	-	-	-	-	.00	.00	-	-	-
F	Eriogonum cernuum (a)	b <sup>33</sup>	a <sup>11</sup>	a <sup>1</sup>	a <sup>2</sup>	b <sup>55</sup>	a <sup>11</sup>	.24	.05	.00	.03	.15	.07
F	Eriogonum racemosum	-	8	4	-	1	-	-	.04	.01	-	.00	-
F	Euphorbia glyptosperma (a)	8	-	-	-	-	2	.04	-	-	-	-	.00
F	Frasera speciosa	-	2	-	-	3	-	-	.00	-	-	.03	-
F	Gilia sp. (a)	a <sup>-</sup>	b <sup>24</sup>	a <sup>-</sup>	b <sup>12</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.12	-	.28	-	-

Type	Species	Nested Frequency						Average Cover %					
		'92	'97	'98	'03	'08	'13	'92	'97	'98	'03	'08	'13
F	Lappula occidentalis (a)	-	4	-	-	-	-	-	.04	-	-	-	-
F	Lupinus argenteus	-	1	-	-	-	-	.03	.03	-	-	-	-
F	Microsteris gracilis (a)	b21	b36	a-	a-	a-	a-	.04	.15	-	-	-	-
F	Oenothera pallida	3	-	3	3	-	-	.03	-	.03	.00	-	-
F	Penstemon sp.	b10	a-	a8	a-	a1	c25	.22	-	.04	-	.03	.74
F	Phlox austromontana	ab15	b23	ab15	ab10	a2	a3	.30	.20	.35	.09	.03	.03
F	Plantago patagonica (a)	c94	b49	d230	a2	ab25	b51	.40	.18	5.37	.03	.07	.31
F	Polygonum douglasii (a)	b16	bc28	a-	a-	a3	a3	.03	.04	-	-	.00	.01
F	Senecio multilobatus	-	1	-	-	-	-	-	.00	-	-	-	-
F	Sphaeralcea parvifolia	a3	a1	a1	a3	a-	b22	.01	.00	.00	.03	-	.10
F	Unknown forb-annual (a)	3	-	-	-	-	-	.01	-	-	-	-	-
Total for Annual Forbs		209	187	268	18	129	92	1.21	0.88	5.55	0.37	0.47	0.51
Total for Perennial Forbs		96	174	153	118	119	216	1.11	2.15	1.69	1.57	2.98	3.45
Total for Forbs		305	361	421	136	248	308	2.33	3.04	7.24	1.94	3.45	3.96

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

#### BROWSE TRENDS--

Management unit 27, Study no: 7

Type	Species	Quadrat Cover %						Line intercept Cover %		
		'92	'97	'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	12.05	8.45	3.32	5.71	7.00	6.18	8.20	10.78	9.63
B	Artemisia filifolia	-	-	.18	-	-	-	-	-	-
B	Artemisia tridentata tridentata	11.92	5.20	3.20	5.41	4.81	6.57	8.03	5.13	9.80
B	Chrysothamnus nauseosus	-	-	-	.00	-	-	.05	-	-
B	Chrysothamnus viscidiflorus	-	.00	-	-	-	-	-	-	-
B	Gutierrezia sarothrae	1.53	.26	.68	.03	.00	.00	-	-	.26
B	Juniperus osteosperma	-	-	-	-	.03	-	-	2.83	2.20
B	Leptodactylon pungens	.06	.06	-	.06	.01	.06	-	-	-
B	Opuntia sp.	-	-	-	-	.00	.15	-	-	-
B	Purshia tridentata	6.50	6.59	7.64	7.50	6.03	7.81	7.71	10.06	16.01
Total for Browse		32.08	20.58	15.03	18.73	17.90	20.79	23.99	28.8	37.9

#### POINT-QUARTER TREE DATA--

Management unit 27, Study no: 7

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	6	<18	22	22
Pinus edulis	-	-	-	20

Average diameter (in)			
'98	'03	'08	'13
8.5	-	3.8	5.4
-	-	-	10

BASIC COVER--

Management unit 27, Study no: 7

Cover Type	Average Cover %					
	'92	'97	'98	'03	'08	'13
Vegetation	34.50	27.35	34.91	20.50	22.11	25.81
Rock	.04	.05	0	.03	.02	.00
Pavement	0	.02	.04	.01	.11	.12
Litter	54.40	47.79	48.42	47.10	54.87	49.47
Cryptogams	2.00	1.94	8.56	.67	.26	.62
Bare Ground	26.89	35.68	30.71	45.26	34.79	39.26

PELLET GROUP DATA--

Management unit 27, Study no: 7

Type	Quadrat Frequency					
	'92	'97	'98	'03	'08	'13
Rabbit	49	20	25	8	77	27
Elk	-	-	-	-	-	-
Deer	26	32	27	23	9	24
Cattle	3	5	5	5	4	2

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
1 (2)	-	-	-
64 (158)	70 (174)	38 (93)	37 (91)
16 (40)	23 (57)	-	1 (2)

BROWSE CHARACTERISTICS--

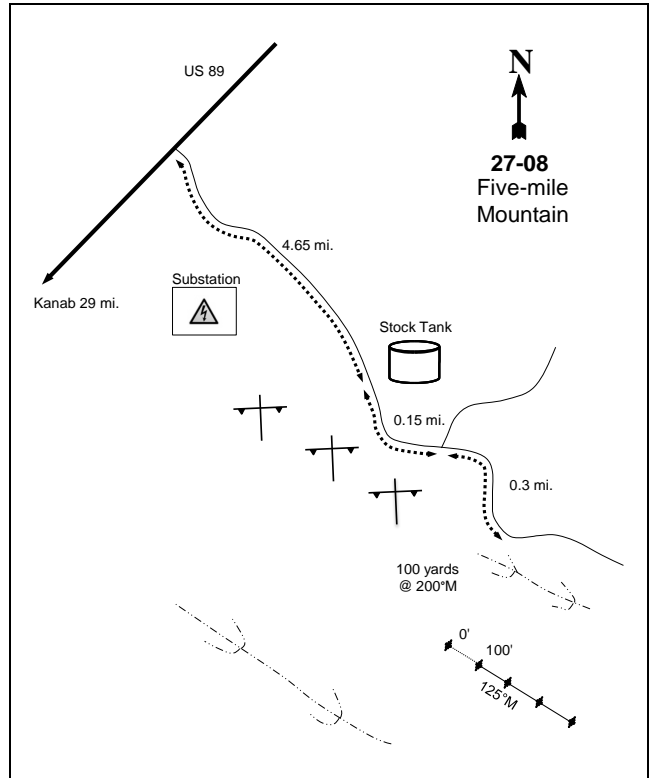
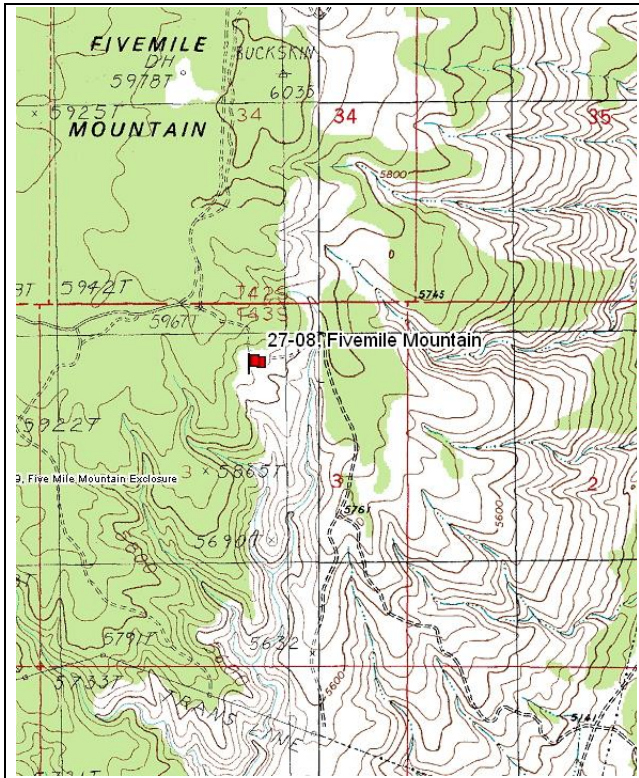
Management unit 27, Study no: 7

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
92	<b>980</b>	45	45	10	120	18	18	10	-/-
97	<b>340</b>	29	59	12	-	47	18	12	83/86
98	<b>380</b>	32	58	11	20	26	21	0	66/73
03	<b>300</b>	27	53	20	-	60	7	7	70/72
08	<b>360</b>	17	50	33	-	33	17	22	78/75
13	<b>340</b>	24	71	6	-	29	0	18	80/95
<b>Artemisia filifolia</b>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
97	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>260</b>	54	46	-	60	0	0	0	9/15
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Artemisia tridentata tridentata</b>									
92	<b>2720</b>	29	38	33	200	15	1	24	-/-
97	<b>1700</b>	19	35	46	20	53	11	46	36/45
98	<b>1880</b>	13	41	46	100	40	9	23	31/37
03	<b>1240</b>	0	37	63	-	15	0	37	31/34
08	<b>1260</b>	3	33	63	-	17	10	51	39/40
13	<b>1640</b>	38	44	18	20	23	1	10	36/46

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus nauseosus</b>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus</b>									
92	0	0	0	-	-	0	0	0	-/-
97	20	0	100	-	-	0	0	0	7/7
98	20	0	100	-	-	0	0	0	18/13
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Eriogonum microthecum</b>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
98	20	0	100	-	-	0	100	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Gutierrezia sarothrae</b>									
92	1180	10	88	2	200	0	0	0	-/-
97	1280	14	83	3	20	0	0	0	11/13
98	1280	3	97	0	20	0	0	0	11/13
03	120	33	67	0	-	0	0	0	11/14
08	40	0	100	0	40	0	0	0	6/5
13	320	13	88	0	-	0	0	0	13/17
<b>Leptodactylon pungens</b>									
92	340	6	94	0	-	0	0	0	-/-
97	280	0	100	0	-	0	0	7	18/20
98	0	0	0	0	-	0	0	0	-/-
03	180	0	100	0	-	0	0	0	5/7
08	80	0	25	75	-	0	75	25	2/3
13	80	50	50	0	-	0	0	0	8/8
<b>Opuntia sp.</b>									
92	40	50	0	50	-	0	0	50	-/-
97	0	0	0	0	-	0	0	0	-/-
98	0	0	0	0	-	0	0	0	4/13
03	20	0	100	0	-	0	0	0	2/3
08	20	100	0	0	-	0	0	0	4/12
13	20	0	100	0	-	0	0	0	3/7

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>Purshia tridentata</i>									
92	1700	25	49	26	40	13	80	16	-/-
97	1240	6	85	8	-	35	55	8	20/41
98	1220	10	77	13	-	18	75	2	20/43
03	960	0	67	33	-	29	71	8	20/38
08	880	2	70	27	-	18	23	7	25/45
13	1380	4	90	6	80	57	1	13	27/56
<i>Ribes sp.</i>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	30/25
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Tetradymia canescens</i>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	19/7
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Yucca sp.</i>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	26/44

FIVEMILE MOUNTAIN - TREND STUDY NO. 27-8



**Location Information**

USGS 7.5 min Map Info Pine Hollow Canyon; Township 43S, Range 2W, Section 3  
 GPS (0' Stake) NAD 83, UTM Zone 12, 410777 East 4107024 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 125° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the 90 degree turn in US 89 in the center of Kanab, go 29.0 miles south on US 89 to the turnoff to Fivemile Mountain. Turn right (southeast) and travel 4.6 miles on the graded road (BLM Rd #710) to a stock tank. Continue on a dirt road 0.15 miles to a fork, bear right. Continue up and over the mountain for 0.3 miles to a bend in the road. Stop here and walk about 100 yards south to the crest of a small ridge and the 0-foot baseline stake. The study runs east-southeast down the ridge.

### Site Information

Land Ownership BLM  
Allotment Five Mile Mountain  
Elevation 5,850ft (1,783m)  
Aspect Southeast  
Slope 7%  
Sample Dates 09/07/1987, 08/16/1992, 08/06/1997, 08/05/2003, 07/30/2008, 08/06/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter

#### VEGETATION HISTORY--

Management unit 27, Study no: 8

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

No remarks

### Site Potential

1981-2010 Average Annual Precipitation 10 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site [Semidesert Shallow Loam \(Black Sagebrush\)](#)  
NRCS Ecological Site # R035XY226UT

#### SOIL ANALYSIS DATA--

Management unit 27, Study no: 8

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	58.4	19.1	22.6	7.2	0.7	2.1	16.0	115.2	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

#### States and Transitions

No state and transition model is available for the above ecological site.

Since establishment in 1987, the site has remained in a stable black sagebrush (*Artemisia nova*) state with a moderately diverse herbaceous understory (Appendix B -Pre-1992 Data, Table - Browse Trends, Table - Herbaceous Trends). Cheatgrass (*Bromus tectorum*) has fluctuated in cover over the sample years, and has been a major component of the herbaceous understory (Table - Herbaceous Trends). Utah juniper (*Juniperus osteosperma*) is scattered across the site, but has been slow to increase on the site (Table - Point-Quarter Tree Data; Table - Browse Trends). Juniper will likely become dominant without a disturbance on the study site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 27, study no: 8

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	28.3	7.8	6.0	4.9	-0.3	1.1	0.0	<b>47.7</b>	Good
1997	16.3	5.7	1.0	4.8	-1.9	0.4	0.0	<b>26.2</b>	Poor-Fair
2003	15.2	-3.3	1.0	4.8	-5.7	2.2	0.0	<b>14.3</b>	Poor
2008	18.4	-3.0	1.0	4.8	-0.4	0.3	0.0	<b>21.1</b>	Poor
2013	17.3	9.6	4.5	6.9	-0.1	0.8	0.0	<b>39.1</b>	Fair

## HERBACEOUS TRENDS--

Management unit 27, Study no: 8

Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
G	<i>Bouteloua gracilis</i>	47	47	45	42	51	1.25	.91	1.39	.82	1.42
G	<i>Bromus tectorum</i> (a)	a18	c206	c228	b81	a18	.07	2.44	6.59	.51	.08
G	<i>Hilaria jamesii</i>	3	-	3	-	5	.03	-	.15	-	.00
G	<i>Oryzopsis hymenoides</i>	b39	b32	a11	a10	a9	.51	.21	.16	.03	.21
G	<i>Poa fendleriana</i>	a3	a4	a3	a1	b13	.03	.00	.00	.03	.20
G	<i>Poa secunda</i>	a15	b38	a7	a7	a6	.08	.40	.06	.02	.06
G	<i>Sitanion hystrix</i>	b22	ab16	a2	ab21	a1	.15	.41	.03	.26	.00
G	<i>Stipa comata</i>	26	42	32	45	50	.39	.28	.47	1.09	1.27
G	<i>Stipa speciosa</i>	1	5	5	1	3	.00	.15	.15	.15	.30
G	<i>Vulpia octoflora</i> (a)	c109	b61	c118	a9	a-	.34	.12	.96	.02	-
Total for Annual Grasses		127	267	346	90	18	0.41	2.56	7.56	0.53	0.08
Total for Perennial Grasses		156	184	108	127	138	2.46	2.38	2.42	2.41	3.47
Total for Grasses		283	451	454	217	156	2.88	4.95	9.98	2.94	3.55
F	<i>Alyssum alyssoides</i> (a)	a-	a-	b17	a-	a-	-	-	.06	-	-
F	<i>Astragalus</i> sp.	c41	b21	a-	b10	c40	.12	.07	-	.03	.21
F	<i>Calochortus nuttallii</i>	9	3	1	-	-	.02	.01	.00	.00	-
F	<i>Collinsia parviflora</i> (a)	-	2	5	3	2	-	.00	.01	.00	.00
F	Cruciferae	6	-	-	-	-	.04	-	-	-	-
F	<i>Descurainia pinnata</i> (a)	ab8	ab4	b10	a-	a-	.02	.01	.05	-	-
F	<i>Draba cuneifolia</i> (a)	b19	a-	ab8	a1	a2	.09	-	.02	.00	.00
F	<i>Erigeron pumilus</i>	ab2	b15	a-	a-	ab3	.03	.02	-	-	.03
F	<i>Eriogonum cernuum</i> (a)	ab2	ab1	a-	b11	a-	.03	.00	-	.02	-
F	<i>Erodium cicutarium</i> (a)	a-	a13	b36	a-	a-	-	.19	1.74	-	-
F	<i>Gilia inconspicua</i> (a)	d144	b18	c62	a-	a-	.48	.03	1.11	-	-
F	<i>Lappula occidentalis</i> (a)	c152	ab6	a-	b15	a-	.48	.01	-	.05	-
F	<i>Lomatium</i> sp.	5	1	-	2	-	.03	.03	-	.01	-
F	<i>Mentzelia</i> sp.	a-	a-	b16	ab9	a-	-	-	1.02	.06	-
F	<i>Penstemon thompsoniae</i>	1	1	-	-	-	.03	.00	-	-	-
F	<i>Phlox longifolia</i>	b27	ab16	a5	ab7	ab11	.25	.06	.06	.02	.02
F	<i>Sphaeralcea grossulariifolia</i>	3	-	-	-	1	.00	-	.01	-	.15



Type	Species	Nested Frequency					Average Cover %				
		'92	'97	'03	'08	'13	'92	'97	'03	'08	'13
F	Unknown forb-annual (a)	5	-	-	-	-	.01	-	-	-	-
F	Zigadenus paniculatus	1	-	-	-	-	.00	-	-	-	-
Total for Annual Forbs		330	44	138	30	4	1.11	0.26	3.00	0.09	0.01
Total for Perennial Forbs		95	57	22	28	55	0.54	0.21	1.09	0.13	0.41
Total for Forbs		425	101	160	58	59	1.66	0.47	4.09	0.22	0.42

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

#### BROWSE TRENDS--

Management unit 27, Study no: 8

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'97	'03	'08	'13	'03	'08	'13
B	Artemisia nova	22.60	13.00	12.19	14.75	13.83	14.50	18.19	22.98
B	Chrysothamnus viscidiflorus stenophyllus	2.09	1.18	.72	1.26	1.76	.63	1.15	2.60
B	Gutierrezia sarothrae	.19	.01	.33	.03	.03	-	-	-
B	Juniperus osteosperma	2.49	-	1.92	2.69	2.02	2.56	1.46	2.15
B	Opuntia sp.	-	.38	.38	.21	.38	.03	-	.11
B	Sclerocactus sp.	.18	.15	.06	.07	.18	.05	.05	-
Total for Browse		27.56	14.72	15.61	19.02	18.22	17.77	20.85	27.84

#### POINT-QUARTER TREE DATA--

Management unit 27, Study no: 8

Species	Trees per Acre			Average diameter (in)		
	'03	'08	'13	'03	'08	'13
Juniperus osteosperma	42	46	46	9.0	11.7	9.5

#### BASIC COVER--

Management unit 27, Study no: 8

Cover Type	Average Cover %				
	'92	'97	'03	'08	'13
Vegetation	30.85	23.60	30.53	23.50	22.30
Rock	44.86	18.30	21.68	21.56	19.79
Pavement	0	18.18	21.40	24.89	20.72
Litter	29.56	28.00	26.07	28.59	23.83
Cryptogams	1.31	2.51	.76	1.20	1.08
Bare Ground	8.08	12.40	11.49	14.12	23.95

PELLET GROUP DATA--

Management unit 27, Study no: 8

Type	Quadrat Frequency				
	'92	'97	'03	'08	'13
Rabbit	8	9	8	44	10
Deer	16	28	26	29	29
Cattle	-	2	2	1	-

Days use per acre (ha)		
'03	'08	'13
-	-	-
27 (66)	35 (86)	15 (36)
5 (13)	5 (13)	4 (9)

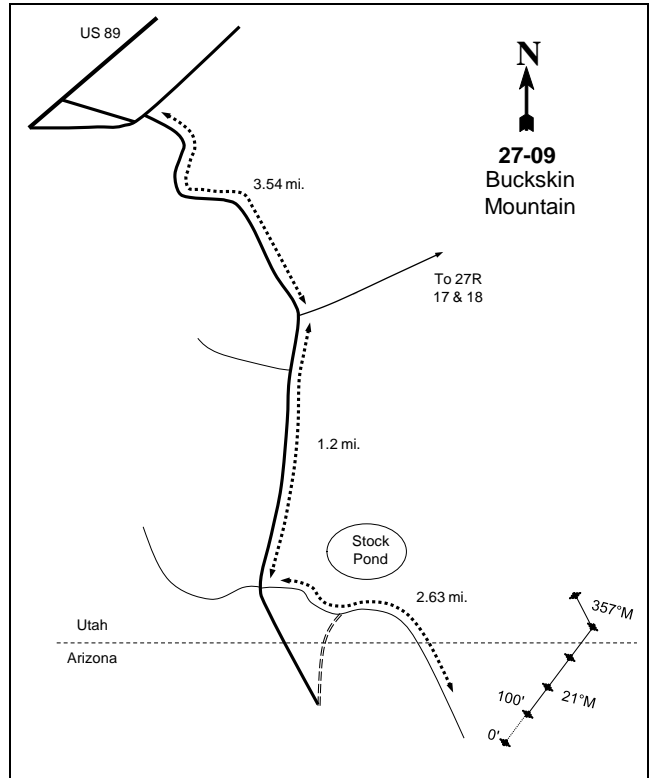
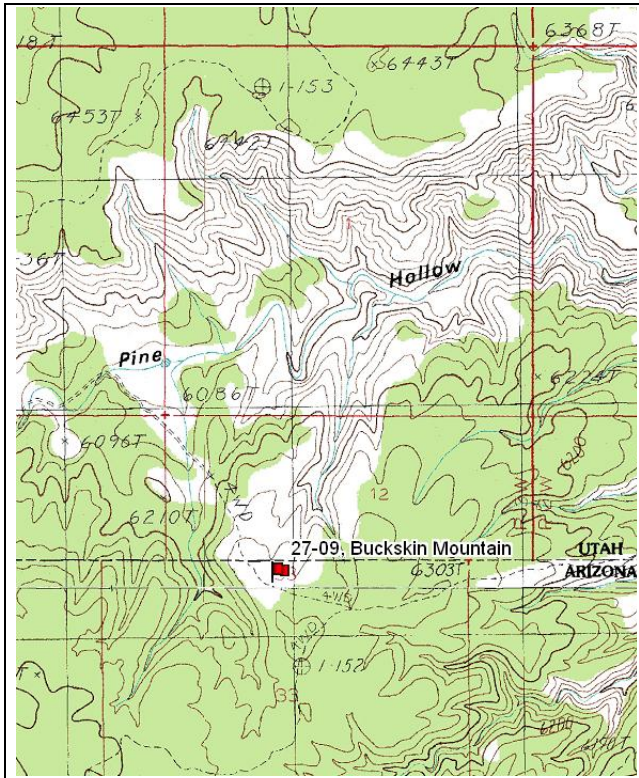
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 8

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 nova</i>									
92	<b>5980</b>	12	64	24	160	22	0	9	-/-
97	<b>4420</b>	2	67	31	100	32	2	13	16/28
03	<b>5260</b>	2	38	61	-	6	0	30	13/23
08	<b>4800</b>	2	39	60	120	42	25	18	16/28
13	<b>3840</b>	9	73	18	20	36	17	17	16/30
<i>Atriplex canescens</i>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	27/27
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Ceratoides lanata</i>									
92	<b>20</b>	0	100	-	20	0	0	0	-/-
97	<b>40</b>	0	100	-	-	0	0	0	9/7
03	<b>40</b>	0	100	-	-	50	0	0	11/8
08	<b>0</b>	0	0	-	-	0	0	0	18/13
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
92	<b>780</b>	5	82	13	-	0	0	10	-/-
97	<b>660</b>	3	64	33	-	0	0	9	11/21
03	<b>560</b>	0	54	46	-	0	0	29	12/22
08	<b>740</b>	3	70	27	-	0	0	16	13/21
13	<b>540</b>	4	81	15	-	11	0	30	13/23
<i>Cowania mexicana stansburiana</i>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	78/101
08	<b>0</b>	0	0	-	-	0	0	0	66/85
13	<b>0</b>	0	0	-	-	0	0	0	-/-

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>Gutierrezia sarothrae</i>									
92	100	0	100	0	80	0	0	0	-/-
97	220	0	82	18	-	0	0	0	7/7
03	140	0	100	0	-	0	0	0	7/7
08	140	14	57	29	20	0	0	29	8/12
13	120	33	67	0	-	0	0	17	6/8
<i>Juniperus osteosperma</i>									
92	40	50	50	-	-	0	0	0	-/-
97	40	50	50	-	-	0	0	0	-/-
03	40	0	100	-	-	0	0	0	-/-
08	40	50	50	-	-	0	0	0	-/-
13	60	67	33	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
92	20	0	100	0	-	0	0	0	-/-
97	60	0	100	0	-	0	0	0	9/27
03	100	20	80	0	-	0	0	0	10/23
08	100	20	40	40	-	0	0	20	9/15
13	120	17	50	33	-	0	0	33	11/15
<i>Pediocactus simpsonii</i>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	2/3
<i>Sclerocactus sp.</i>									
92	100	40	40	20	-	0	0	20	-/-
97	60	33	67	0	-	0	0	0	5/8
03	100	20	40	40	-	0	0	40	4/5
08	120	17	83	0	-	0	0	0	5/6
13	100	0	80	20	-	0	0	20	6/8
<i>Yucca sp.</i>									
92	0	0	0	-	-	0	0	0	-/-
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	19/25
08	0	0	0	-	-	0	0	0	21/22
13	20	0	100	-	-	0	0	0	19/21

BUCKSKIN MOUNTAIN - TREND STUDY NO. 27-9



**Location Information**

USGS 7.5 min Map Info Pine Hollow Canyon; Township 44S, Range 3W, Section 12  
 GPS (0' Stake) NAD 83, UTM Zone 12, 403846 East 4095438 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 21° magnetic (Line 5: 357° magnetic)  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From Kanab, head east on U.S. 89 to mile marker 44. Go 0.6 miles south of the mile marker to a road on the right (BLM Rd. #730). Drive 1.2 miles to a fork on the right. Go right (main road) for 1.4 miles to a left turn (BLM Rd. #723). Go 1.7 miles to another fork and go straight (left). Drive 2.9 miles to another fork. Stay on the main road (right) for 0.75 miles to a fork. Go straight at the fork for 1.95 miles to another right fork. Go 0.1 miles to a right fork. Continue 0.7 miles to the Arizona-Utah border sign. From this sign, walk 50 feet at 326 degrees magnetic to the 0-foot stake. The study is marked by steel, green fenceposts approximately 12-18 inches in height.

### Site Information

Land Ownership BLM  
Allotment Coyote  
Elevation 6,340ft (1,932m)  
Aspect North  
Slope 4%  
Sample Dates 08/12/1997, 08/05/2003, 07/30/2008, 08/06/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter

#### VEGETATION HISTORY--

Management unit 27, Study no: 9

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1997-2013	Basin Big Sagebrush/Stansbury Cliffrose/Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Pellet group transect data estimated deer use to be extremely heavy in 2003 and 2008 (Table – Pellet Group Data). The transect crosses the Utah/Arizona border. The browse tag number needs to be collected during the next sampling.

### Site Potential

1981-2010 Average Annual Precipitation 12 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site [Upland Shallow Loam \(Cliffrose\)](#)  
NRCS Ecological Site # R035XY313UT

#### SOIL ANALYSIS DATA--

Management unit 27, Study no: 9

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	41.7	32.7	25.6	7.4	0.4	2.6	25.7	121.6	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

#### States and Transitions

No state and transition model is available for the above ecological site.

Since establishment in 1997, the site has remained a mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) with a poor herbaceous understory dominated by cheatgrass (*Bromus tectorum*) (Table - Browse Trends, Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) are scattered across the site and have increased in size and cover (Table - Browse Characteristics). The site appears to be transitioning to a pinyon and juniper dominated state.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 27, study no: 9

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	25.2	6.6	9.5	0.7	-19.2	0.1	0.0	<b>22.8</b>	Poor
2003	15.7	4.1	4.4	0.1	-15.4	0.0	0.0	<b>8.9</b>	Very Poor-Poor
2008	9.6	-7.1	0.5	0.1	-5.7	0.0	0.0	<b>-2.6</b>	Very Poor
2013	15.6	6.3	8.0	1.8	-2.3	0.3	0.0	<b>29.8</b>	Fair

## HERBACEOUS TRENDS--

Management unit 27, Study no: 9

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Bouteloua gracilis</i>	1	-	-	-	.00	-	-	-
G	<i>Bromus tectorum</i> (a)	c453	b368	b352	a280	25.61	20.39	7.65	3.03
G	<i>Festuca ovina</i>	7	1	-	-	.03	.00	-	-
G	<i>Poa fendleriana</i>	6	-	-	1	.21	-	-	.03
G	<i>Poa secunda</i>	ab10	a5	a3	b14	.01	.03	.03	.05
G	<i>Sitanion hystrix</i>	b26	a1	a5	b32	.10	.00	.01	.82
G	<i>Stipa comata</i>	-	-	-	2	-	-	-	.00
G	<i>Vulpia octoflora</i> (a)	a-	b38	a4	a1	-	.16	.00	.00
Total for Annual Grasses		453	406	356	281	25.61	20.55	7.66	3.03
Total for Perennial Grasses		50	7	8	49	0.35	0.03	0.04	0.91
Total for Grasses		503	413	364	330	25.97	20.59	7.70	3.95
F	<i>Agoseris glauca</i>	-	-	1	-	-	-	.00	-
F	<i>Calochortus nuttallii</i>	6	-	-	-	.01	-	-	-
F	<i>Descurainia pinnata</i> (a)	-	5	-	-	-	.02	-	-
F	<i>Draba</i> sp. (a)	a-	b46	a-	a-	-	.27	-	-
F	<i>Erigeron</i> sp.	6	-	-	-	.01	-	-	-
F	<i>Erodium cicutarium</i> (a)	a-	b25	a-	a3	-	1.04	-	.00
F	<i>Gilia</i> sp. (a)	a11	b138	a7	a2	.01	2.66	.02	.00
F	<i>Holosteum umbellatum</i> (a)	-	2	1	-	-	.00	.00	-
F	<i>Lappula occidentalis</i> (a)	a-	b23	a7	a1	-	.11	.01	.00
F	<i>Microsteris gracilis</i> (a)	a2	b16	ab8	a3	.00	.06	.02	.00
F	<i>Phlox longifolia</i>	5	-	1	2	.01	-	.00	.00
F	<i>Plantago patagonica</i> (a)	-	2	-	-	-	.00	-	-
F	<i>Ranunculus testiculatus</i> (a)	a1	a28	b60	b86	.00	.12	.16	.24
F	<i>Salsola iberica</i> (a)	-	-	-	4	-	-	-	.00
F	<i>Sphaeralcea grossulariifolia</i>	1	10	-	7	.00	.01	-	.16
F	Unknown forb-annual (a)	-	6	-	-	-	.04	-	-
F	<i>Zigadenus paniculatus</i>	-	-	3	1	-	-	.00	.00
Total for Annual Forbs		14	291	83	99	0.02	4.35	0.22	0.26
Total for Perennial Forbs		18	10	5	10	0.04	0.01	0.01	0.17

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
	Total for Forbs	32	301	88	109	0.06	4.37	0.23	0.44

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

#### BROWSE TRENDS--

Management unit 27, Study no: 9

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata</i> tridentata	12.20	8.77	6.38	10.92	7.31	7.11	12.23
B	<i>Cowania mexicana</i> stansburiana	6.55	2.83	.77	.86	8.36	5.60	14.98
B	<i>Ephedra viridis</i>	.06	.38	.38	.53	-	.06	.30
B	<i>Gutierrezia sarothrae</i>	1.08	.11	-	.09	.06	-	-
B	<i>Juniperus osteosperma</i>	3.58	3.43	2.86	4.10	7.20	9.30	11.01
B	<i>Opuntia</i> sp.	.00	.03	-	-	-	-	-
	Total for Browse	23.48	15.56	10.40	16.51	22.93	22.07	38.52

#### POINT-QUARTER TREE DATA--

Management unit 27, Study no: 9

Species	Trees per Acre			Average diameter (in)		
	'03	'08	'13	'03	'08	'13
<i>Cowania mexicana</i> stansburiana	61	67	-	10.2	12.1	-
<i>Juniperus osteosperma</i>	78	74	70	6.8	7.9	8.2
<i>Pinus edulis</i>	-	-	19	-	-	9.1

#### BASIC COVER--

Management unit 27, Study no: 9

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	38.47	37.72	20.11	19.65
Rock	4.40	5.34	5.23	3.78
Pavement	19.59	21.30	13.80	20.77
Litter	48.10	43.54	67.65	52.69
Cryptogams	.61	.04	.25	.19
Bare Ground	5.84	8.62	7.96	14.24

PELLET GROUP DATA--

Management unit 27, Study no: 9

Type	Quadrat Frequency			
	'97	'03	'08	'13
Rabbit	24	14	69	11
Elk	5	1	-	-
Deer	49	31	28	26
Cattle	1	3	1	-

Days use per acre (ha)		
'03	'08	'13
-	-	-
1 (2)	1 (2)	-
98 (243)	100 (248)	38 (94)
4 (11)	3 (7)	1 (2)

BROWSE CHARACTERISTICS--

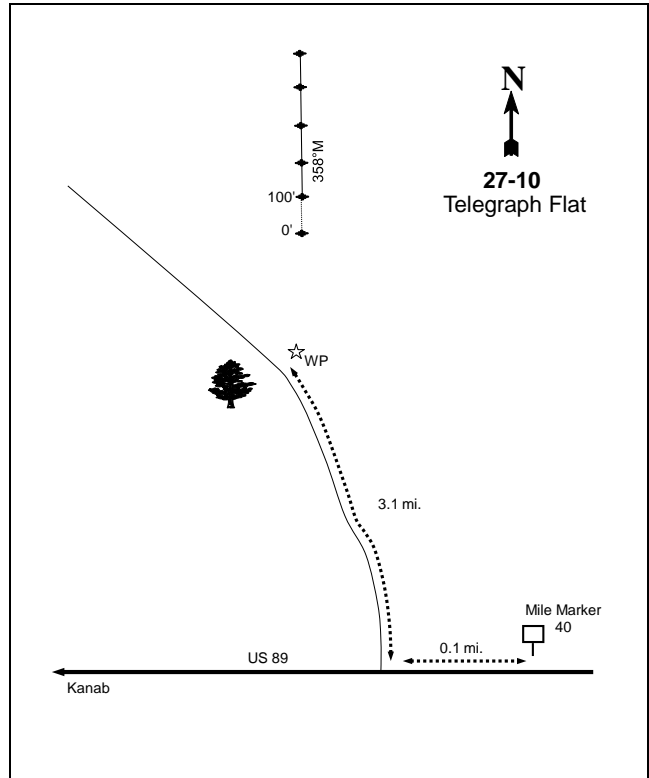
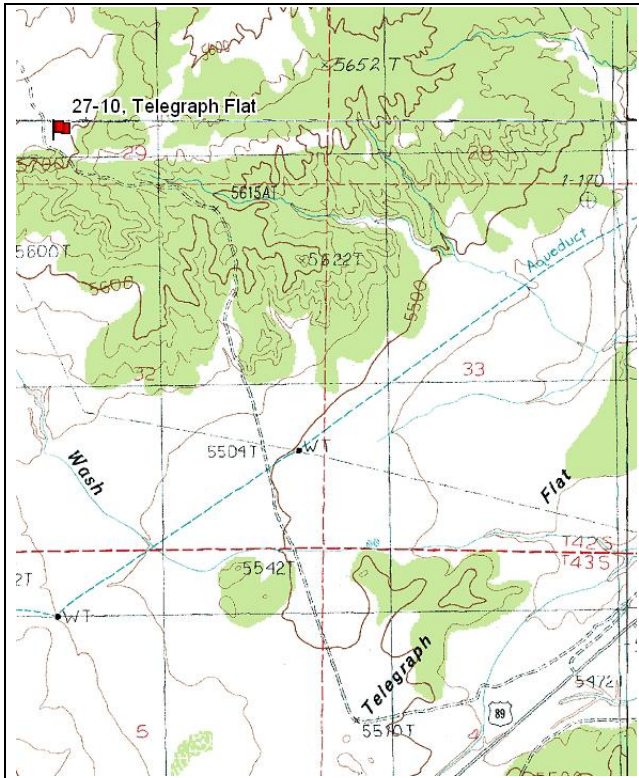
Management unit 27, Study no: 9

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</i>									
97	<b>2920</b>	25	41	34	640	30	9	15	29/37
03	<b>2180</b>	10	46	44	-	4	0	12	27/29
08	<b>1700</b>	0	25	75	-	25	18	55	33/36
13	<b>1980</b>	18	51	31	140	30	0	32	34/41
<i>Cowania mexicana stansburiana</i>									
97	<b>240</b>	8	75	17	20	17	0	8	94/95
03	<b>360</b>	6	78	17	-	6	17	0	93/97
08	<b>220</b>	9	18	73	-	18	0	55	84/79
13	<b>200</b>	0	80	20	-	20	10	10	96/92
<i>Ephedra viridis</i>									
97	<b>60</b>	0	100	0	-	0	0	0	28/30
03	<b>0</b>	0	0	0	-	0	0	0	35/47
08	<b>40</b>	0	50	50	-	50	0	0	37/53
13	<b>40</b>	0	100	0	-	0	0	0	36/53
<i>Gutierrezia sarothrae</i>									
97	<b>1120</b>	5	86	9	-	0	0	9	8/11
03	<b>860</b>	51	49	0	400	0	0	0	6/7
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>300</b>	0	93	7	-	0	0	27	8/10
<i>Juniperus osteosperma</i>									
97	<b>140</b>	14	86	0	-	0	0	0	-/-
03	<b>100</b>	0	100	0	-	0	0	0	-/-
08	<b>120</b>	17	67	17	-	0	0	0	-/-
13	<b>120</b>	0	100	0	-	0	0	0	-/-
<i>Opuntia sp.</i>									
97	<b>80</b>	50	50	0	-	0	0	0	6/15
03	<b>40</b>	0	100	0	-	0	0	0	6/18
08	<b>40</b>	0	100	0	-	0	0	0	4/5
13	<b>60</b>	0	67	33	-	0	0	0	8/18



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Opuntia whipplei</b>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	15/23	
08	0	0	0	-	-	0	0	0	11/26	
13	20	100	0	-	-	0	0	0	10/31	
<b>Pediocactus simpsonii</b>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	7/24	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	3/4	
<b>Purshia tridentata</b>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	11/26	
13	0	0	0	-	-	0	0	0	-/-	
<b>Sclerocactus sp.</b>										
97	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	9/24	
13	0	0	0	-	-	0	0	0	7/15	
<b>Yucca sp.</b>										
97	0	0	0	-	-	0	0	0	24/34	
03	0	0	0	-	-	0	0	0	30/40	
08	0	0	0	-	-	0	0	0	22/30	
13	0	0	0	-	-	0	0	0	33/46	

TELEGRAPH FLAT - TREND STUDY NO. 27-10



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Petrified Hollow; Township 42S, Range 3W, Section 29  
NAD 83, UTM Zone 12, 397490 East 4109269 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
358° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
Standard

**Directions to Site**

From mile marker #40 on Highway 89 east of Kanab, go 0.1 mile east to a road on the north side of the road. Turn right (north) and go for 2.7 miles to a witness post on the right side of the road. From the witness post walk 14 paces at 0 degrees magnetic to the 0' stake. The study runs north and is marked by green, steel fenceposts approximately 12-18 inches in height.

**Site Information**

Land Ownership BLM  
 Allotment Mollies Nipple  
 Elevation 5,710ft (1,740m)  
 Aspect Northwest  
 Slope 2%  
 Sample Dates 08/11/1997, 08/05/2003, 07/28/2008, 08/06/2013

**DISTURBANCE HISTORY--**

Management unit 27, Study no: 10

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	Clay Hole Chaining		1966	
Seeding	Clay Hole Chaining		1966	
Lop and Scatter	Five Mile Mountain Habitat Restoration Phase III	<a href="#">1169</a>	Fall 2008-Spring 2009	1,043

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 27, Study no: 10

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1997	Wyoming Big Sagebrush	Phase I
2003-2008	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2013	Wyoming Big Sagebrush/Stansbury cliffrose	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

No remarks

**Site Potential**

1981-2010 Average Annual Precipitation 10 inches  
 NRCS Taxonomical soil Classification Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R035XY209UT

**SOIL ANALYSIS DATA--**

Management unit 27, Study no: 10

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	62.4	19.1	18.6	7.2	0.6	1.3	20.2	124.8	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

A defined [state and transition model](#) is available.

Since establishment in 1997, the site has been in the perennial shrubland state with Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) being the dominant species with a minor component of stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*), pinyon pine (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*) (Community Phase 2.1). When the study was established, the herbaceous understory was

comprised mostly of the introduced perennial grass species crested wheatgrass (*Agropyron cristatum*), but in subsquence sampling years crested wheatgrass was not found on the site and the herbaceous understory vegetation has been limited. Pinyon and juniper were mostly removed from the site following the lop and scatter treatment in 2009 maintaining a perennial shrubland community phase.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 27, study no: 10

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	17.4	12.2	15.0	12.3	0.0	0.5	0.0	<b>57.3</b>	Good
2003	20.2	3.4	2.3	0.6	0.0	0.2	0.0	<b>26.7</b>	Poor-Fair
2008	19.1	-0.6	5.6	0.2	0.0	0.1	0.0	<b>24.5</b>	Poor-Fair
2013	21.2	11.5	13.9	0.5	0.0	0.1	0.0	<b>47.2</b>	Good

#### HERBACEOUS TRENDS--

Management unit 27, Study no: 10

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	<i>Agropyron cristatum</i>	<sub>b</sub> 252	<sup>a-</sup>	<sup>a-</sup>	<sup>a-</sup>	5.83	-	-	-
G	<i>Aristida purpurea</i>	<sub>b</sub> 8	<sub>b</sub> 21	<sup>a-</sup>	<sup>a-</sup>	.20	.24	-	-
G	<i>Bromus tectorum</i> (a)	2	-	-	-	.00	-	-	-
G	<i>Festuca ovina</i>	8	-	-	-	.01	-	-	-
G	<i>Oryzopsis hymenoides</i>	8	6	1	1	.06	.03	.00	.00
G	<i>Sitanion hystrix</i>	3	6	12	8	.03	.01	.10	.06
G	<i>Stipa comata</i>	-	-	-	4	-	-	-	.18
G	<i>Vulpia octoflora</i> (a)	10	-	4	3	.04	-	.00	.00
Total for Annual Grasses		12	0	4	3	0.05	0	0.00	0.00
Total for Perennial Grasses		279	33	13	13	6.15	0.29	0.10	0.24
Total for Grasses		291	33	17	16	6.20	0.29	0.11	0.25
F	<i>Agoseris glauca</i>	1	-	-	-	.00	-	-	-
F	<i>Astragalus</i> sp.	5	-	-	-	.03	-	-	-
F	<i>Calochortus nuttallii</i>	-	3	-	1	.00	.01	-	.00
F	<i>Castilleja</i> sp.	1	-	-	-	.00	-	-	-
F	<i>Eriogonum umbellatum</i>	-	1	1	1	-	.00	.03	.03
F	<i>Gilia</i> sp. (a)	<sub>a</sub> 2	<sub>b</sub> 29	<sup>a-</sup>	<sup>a-</sup>	.00	1.01	-	-
F	<i>Holosteum umbellatum</i> (a)	3	-	-	-	.00	-	-	-
F	<i>Machaeranthera canescens</i>	-	1	-	-	-	.00	-	-
F	<i>Microsteris gracilis</i> (a)	3	-	2	-	.00	-	.00	-
F	<i>Navarretia intertexta</i> (a)	<sup>a-</sup>	<sub>c</sub> 89	<sub>b</sub> 18	<sup>a-</sup>	-	2.49	.03	-
F	<i>Phlox austromontana</i>	8	7	-	-	.18	.06	-	-
F	<i>Sphaeralcea grossulariifolia</i>	-	1	-	1	-	.00	-	.00
F	<i>Stephanomeria exigua</i> (a)	-	2	-	-	-	.03	-	-
F	<i>Swertia albomarginata</i>	-	-	4	-	-	-	.01	-
F	Unknown forb-annual (a)	3	-	-	-	.03	-	-	-

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
	Total for Annual Forbs	11	120	20	0	0.04	3.53	0.04	0
	Total for Perennial Forbs	15	13	5	3	0.23	0.08	0.04	0.04
	Total for Forbs	26	133	25	3	0.28	3.62	0.08	0.04

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

#### BROWSE TRENDS--

Management unit 27, Study no: 10

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	.03	-	-	-	-	-	-
B	Artemisia tridentata wyomingensis	11.61	13.33	13.45	14.27	13.56	19.48	21.21
B	Cowania mexicana stansburiana	1.90	2.35	1.53	1.89	3.90	4.36	8.23
B	Ephedra viridis	-	-	.03	.41	-	-	-
B	Gutierrezia sarothrae	-	.19	.00	.03	-	-	.06
B	Juniperus osteosperma	1.26	2.00	3.15	.06	2.60	3.38	.70
B	Pinus edulis	1.66	2.62	2.90	-	4.00	4.41	-
B	Yucca sp.	.38	-	-	-	-	-	-
	Total for Browse	16.84	20.52	21.07	16.66	24.06	31.63	30.2

#### POINT-QUARTER TREE DATA--

Management unit 27, Study no: 10

Species	Trees per Acre			Average diameter (in)		
	'03	'08	'13	'03	'08	'13
Juniperus osteosperma	36	35	<18	2.7	6.4	-
Pinus edulis	28	28	<18	5.4	5.1	-

#### BASIC COVER--

Management unit 27, Study no: 10

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	22.68	24.62	21.70	16.47
Rock	0	0	0	.15
Pavement	.06	.05	.10	1.03
Litter	28.17	34.32	38.67	37.15
Cryptogams	4.69	6.74	3.29	3.13
Bare Ground	49.65	48.52	49.61	51.11

PELLET GROUP DATA--

Management unit 27, Study no: 10

Type	Quadrat Frequency			
	'97	'03	'08	'13
Sheep	1	-	-	-
Rabbit	18	19	78	13
Elk	3	-	1	-
Deer	19	24	20	13
Cattle	-	7	7	2

Days use per acre (ha)		
'03	'08	'13
-	-	-
-	-	-
-	-	-
28 (69)	29 (71)	7 (18)
17 (41)	2 (5)	1 (2)

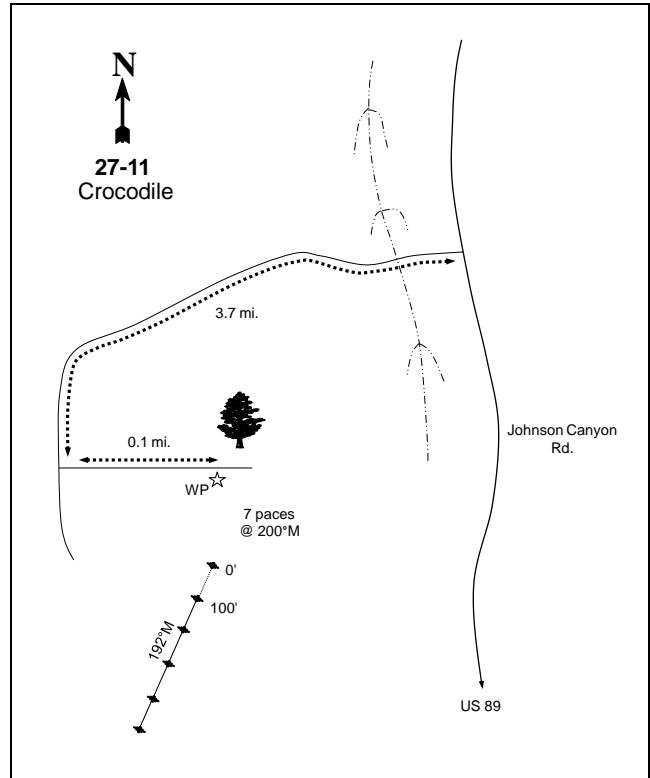
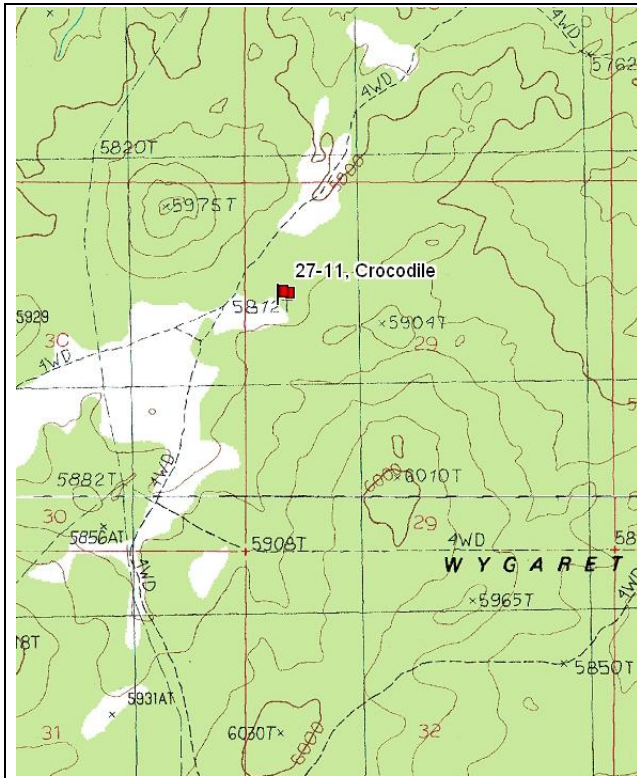
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 10

		Age class distribution			Utilization				
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
<i>Amelanchier utahensis</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	12/11
13	0	0	0	-	-	0	0	0	43/41
<i>Artemisia frigida</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	24/21
<i>Artemisia tridentata wyomingensis</i>									
97	12760	50	40	10	140	55	12	4	20/31
03	8340	1	57	42	-	13	30	21	17/23
08	9180	12	37	50	1480	48	30	10	21/27
13	6960	28	63	9	20	66	12	10	23/37
<i>Chrysothamnus nauseosus</i>									
97	80	100	0	-	-	100	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Cowania mexicana stansburiana</i>									
97	400	55	40	5	-	60	0	0	59/68
03	320	25	56	19	-	13	69	0	54/66
08	380	5	26	68	-	26	68	21	47/54
13	360	22	44	33	-	22	33	28	54/60
<i>Ephedra viridis</i>									
97	0	0	0	0	-	0	0	0	-/-
03	20	0	100	0	-	0	0	0	22/16
08	20	0	0	100	-	0	0	100	23/14
13	40	50	50	0	-	0	0	0	26/18

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>Gutierrezia sarothrae</i>									
97	100	0	80	20	-	0	0	0	9/10
03	280	7	93	0	-	0	0	0	9/12
08	100	20	60	20	-	0	0	0	8/8
13	100	20	80	0	100	0	0	0	9/8
<i>Juniperus osteosperma</i>									
97	80	25	75	-	-	0	0	0	-/-
03	60	0	100	-	-	0	0	0	-/-
08	80	50	50	-	-	0	0	0	-/-
13	40	100	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	4/9
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
97	40	0	100	-	-	0	0	0	-/-
03	40	0	100	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Yucca sp.</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	19/24
08	0	0	0	-	-	0	0	0	21/23
13	0	0	0	-	-	0	0	0	23/29

CROCODILE - TREND STUDY NO. 27-11



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Cutler Point; Township 42S, Range 5W, Section 29  
NAD 83, UTM Zone 12, 371555 East 4110527 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
192° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) Line 5 (95ft)  
Standard

**Directions to Site**

From the LDS church in Alton, travel south 10.8 miles. At this intersection turn left and head towards Kanab. Continue 6.8 miles to another intersection. Turn south on the pavement and go 9.8 miles to another intersection. Turn right (west) and go 0.1 miles to a left fork. Take this fork and go 3.7 miles across a large wash to a two track road on the left. Go 0.1 miles to a witness post on the right (south) side of the road. From the witness post, walk 7 paces at 200 degrees magnetic to the 0-foot stake.



**Site Information**

Land Ownership BLM  
 Allotment Oak Springs  
 Elevation 5,820ft (1,774m)  
 Aspect Northwest  
 Slope 3-10%  
 Sample Dates 08/19/1997, 07/14/2003, 07/15/2008, 07/31/2013

**DISTURBANCE HISTORY--**

Management unit 27, Study no: 11

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Seeding	-	-	1960's	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 27, Study no: 11

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1997-2013	Basin Big Sagebrush/Bitterbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The browse tag number needs to be collected during the next sample reading. It was noted when the study was established that the herbaceous vegetation was heavily utilized. A water trough is approximately a quarter of a mile to the west of the site.

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Sand \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R035XY307UT

**SOIL ANALYSIS DATA--**

Management unit 27, Study no: 11

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sand	91.6	2.4	5.9	5.8	0.2	0.3	9.6	19.2	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1997, the site has remained a stable mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and antelope bitterbrush (*Purshia tridentata*) with a limited herbaceous understory (Table - Browse Trends, Table - Browse Characteristics). Perennial grasses have decreased substantially on the site since the establishment of the study. Introduced plant species have been a minor component of the community (Table - Herbaceous Trends). Utah juniper (*Juniperus osteosperma*) is scattered across the study site but is more prevalent in areas adjacent to the study site (Table - Point-Quarter Tree Data). It is predicted

that without disturbance juniper will likely continue to encroach and infill, eventually becoming the dominant component of the study site.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 27, study no: 11

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	19.0	12.7	9.9	8.2	-0.1	0.3	0.0	<b>49.9</b>	Good
2003	20.2	1.4	4.3	5.0	0.0	1.4	0.0	<b>32.3</b>	Fair
2008	18.9	1.7	3.0	2.0	0.0	0.1	0.0	<b>25.7</b>	Poor-Fair
2013	24.1	8.5	2.4	6.3	-0.1	7.1	0.0	<b>48.2</b>	Good

#### HERBACEOUS TRENDS--

Management unit 27, Study no: 11

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Agropyron cristatum	b43	a-	a-	a-	.30	-	-	-
G	Agropyron smithii	a-	a-	a-	b13	-	-	-	.10
G	Aristida purpurea	-	2	-	-	-	.03	-	-
G	Bouteloua gracilis	19	15	13	26	.11	.26	.11	.86
G	Bromus tectorum (a)	-	-	-	5	-	-	-	.02
G	Muhlenbergia pungens	b49	ab26	b39	a18	1.65	.43	.57	1.01
G	Oryzopsis hymenoides	a-	b31	b17	b18	.00	.40	.15	.49
G	Sitanion hystrix	10	2	1	5	.12	.06	.03	.18
G	Sporobolus cryptandrus	b60	a8	a10	b51	.43	.01	.05	.33
G	Stipa comata	b106	b73	a13	a16	1.47	1.31	.07	.14
G	Vulpia octoflora (a)	b54	a-	a-	a11	.15	-	-	.16
Total for Annual Grasses		54	0	0	16	0.15	0	0	0.19
Total for Perennial Grasses		287	157	93	147	4.10	2.51	0.99	3.14
Total for Grasses		341	157	93	163	4.25	2.51	0.99	3.33
F	Astragalus convallarius	-	3	-	-	-	.03	-	-
F	Astragalus sp.	b14	a-	a-	a-	.02	-	-	-
F	Comandra pallida	a6	b10	a-	b18	.06	.34	-	.42
F	Cryptantha sp.	-	-	1	3	-	-	.00	.01
F	Eriogonum cernuum (a)	3	-	-	1	.00	-	-	.03
F	Euphorbia sp.	a-	a-	a-	b52	-	-	-	.33
F	Gilia sp. (a)	-	12	1	-	-	.09	.00	-
F	Hymenopappus filifolius	-	-	-	1	-	-	-	.03
F	Lappula occidentalis (a)	3	-	-	-	.01	-	-	-
F	Lotus utahensis	-	-	-	-	-	-	.03	-
F	Oenothera pallida	a-	b10	a-	c109	-	.21	-	2.50
F	Plantago patagonica (a)	a5	b27	a-	b34	.01	.32	-	.06
F	Psoralea tenuiflora	4	6	-	6	.01	.01	-	.06
F	Sphaeralcea grossulariifolia	a3	b19	a2	b28	.03	.10	.00	.18

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
	Total for Annual Forbs	11	39	1	35	0.02	0.42	0.00	0.09
	Total for Perennial Forbs	27	48	3	217	0.13	0.70	0.04	3.55
	Total for Forbs	38	87	4	252	0.15	1.12	0.04	3.65

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

#### BROWSE TRENDS--

Management unit 27, Study no: 11

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Artemisia filifolia	.15	.85	.38	.85	.56	.65	1.04
B	Artemisia tridentata tridentata	7.94	8.96	9.60	11.71	11.61	14.40	14.41
B	Chrysothamnus nauseosus hololeucus	.28	.15	.30	.96	.71	1.41	2.20
B	Chrysothamnus viscidiflorus	-	-	-	.00	.43	-	-
B	Gutierrezia sarothrae	1.04	.11	.09	1.29	-	.08	1.55
B	Leptodactylon pungens	.04	.06	.00	.03	.01	-	-
B	Opuntia sp.	.03	-	-	-	-	-	-
B	Purshia tridentata	6.03	5.97	4.60	6.31	10.00	8.70	8.00
B	Yucca sp.	.15	.15	.38	-	.66	.58	-
	Total for Browse	15.66	16.25	15.36	21.16	23.98	25.82	27.2

#### POINT-QUARTER TREE DATA--

Management unit 27, Study no: 11

Species	Trees per Acre				Average diameter (in)			
	'97	'03	'08	'13	'03	'08	'13	
Juniperus osteosperma	10	<18	<18	20	13.4	-	-	10

#### BASIC COVER--

Management unit 27, Study no: 11

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	18.82	20.58	17.27	29.75
Rock	.02	.06	.05	.04
Pavement	.08	.04	.26	.18
Litter	34.13	39.60	44.00	36.27
Cryptogams	.28	1.09	.48	.69
Bare Ground	54.99	55.61	53.47	44.37

PELLET GROUP DATA--

Management unit 27, Study no: 11

Type	Quadrat Frequency				Days use per acre (ha)			
	'97	'03	'08	'13	'97	'03	'08	'13
Rabbit	29	16	81	12	-	-	-	-
Grouse	-	-	-	1	-	-	-	-
Elk	8	-	-	2	1 (2)	-	-	-
Deer	44	37	33	39	86 (212)	88 (218)	21 (53)	60 (149)
Cattle	6	2	2	1	20 (49)	12 (30)	6 (14)	1 (2)

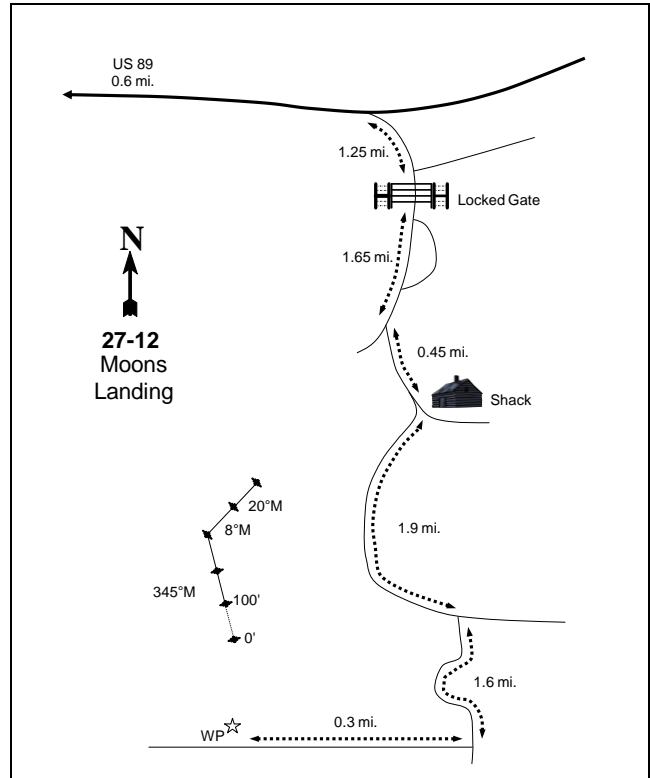
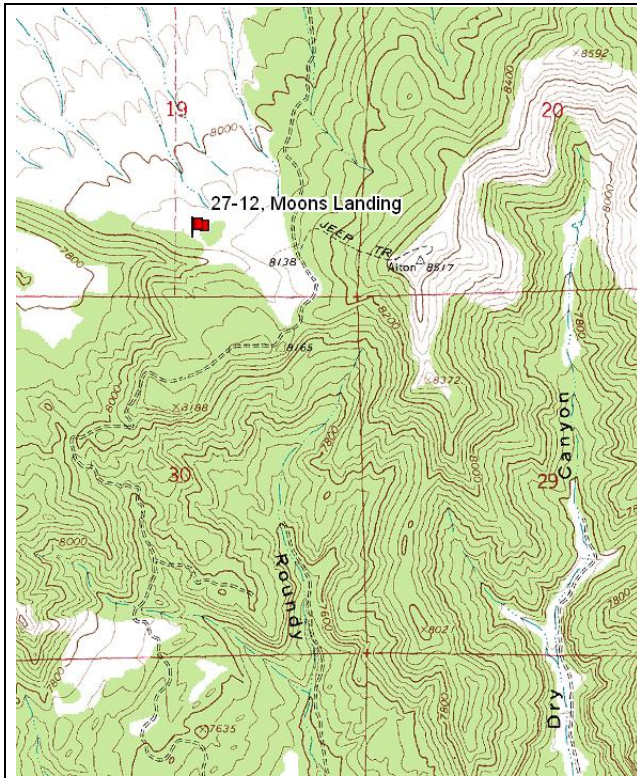
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 11

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia filifolia</i>									
97	<b>60</b>	0	100	0	-	0	0	0	20/19
03	<b>120</b>	0	67	33	-	0	0	0	23/18
08	<b>80</b>	0	25	75	-	100	0	0	34/34
13	<b>100</b>	20	80	0	-	0	20	20	28/32
<i>Artemisia tridentata tridentata</i>									
97	<b>2860</b>	28	60	12	280	32	7	8	46/49
03	<b>2340</b>	13	30	57	-	53	.85	26	33/35
08	<b>1860</b>	5	53	42	40	31	5	18	40/48
13	<b>1520</b>	3	70	28	-	58	21	18	34/50
<i>Chrysothamnus nauseosus hololeucus</i>									
97	<b>400</b>	15	70	15	-	0	0	5	23/27
03	<b>280</b>	0	57	43	-	0	0	7	28/31
08	<b>240</b>	0	0	100	-	25	8	17	33/45
13	<b>260</b>	8	77	15	-	15	15	31	26/35
<i>Chrysothamnus viscidiflorus</i>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	22/23
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	7/15
<i>Ephedra viridis</i>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	44/46
08	<b>0</b>	0	0	-	-	0	0	0	55/72
13	<b>0</b>	0	0	-	-	0	0	0	41/62
<i>Gutierrezia sarothrae</i>									
97	<b>1620</b>	9	85	6	-	0	0	6	8/11
03	<b>1020</b>	73	24	4	-	0	0	0	9/10
08	<b>680</b>	6	68	26	-	15	3	24	5/6
13	<b>2320</b>	23	74	3	40	.86	0	.86	8/11

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Leptodactylon pungens</b>										
97	<b>120</b>	0	100	0	-	0	0	0	6/3	
03	<b>340</b>	0	100	0	-	0	0	0	5/6	
08	<b>80</b>	25	50	25	-	0	0	25	-/-	
13	<b>100</b>	0	100	0	140	80	0	0	7/9	
<b>Opuntia sp.</b>										
97	<b>60</b>	0	100	-	-	0	0	0	3/6	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	4/9	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<b>Purshia tridentata</b>										
97	<b>900</b>	9	89	2	-	36	56	2	71/81	
03	<b>1160</b>	2	71	28	-	10	86	10	35/52	
08	<b>780</b>	8	44	49	-	23	10	36	32/54	
13	<b>780</b>	8	82	10	-	31	56	10	35/61	
<b>Yucca sp.</b>										
97	<b>20</b>	0	100	-	-	0	0	0	20/37	
03	<b>20</b>	0	100	-	-	0	0	0	39/57	
08	<b>20</b>	0	100	-	-	100	0	0	40/42	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

MOONS LANDING - TREND STUDY NO. 27-12



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Alton; Township 38S, Range 5W, Section 19  
NAD 83, UTM Zone 12, 371047 East 4149892 North

**Transect Information**

Browse Tag # (0' Stake)

Not Available

Transect Bearing

345° magnetic (Line 4: 8° magnetic, Line 5: 20° magnetic)

Length

500ft

Belt Placement

Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) Line 5 (95ft)

Belt Marker Placement

Belt 2: 6ft, Belt 3: 4ft, Belt 4: 1ft, Belt 5: 2ft

**Directions to Site**

From US 89, go approximately 0.4 miles south of mile marker #111 to a road on the left. Go 0.6 miles to a fork. Stay on Bryce Woodland Road (right) and go 1.0 mile to a fork. Stay right on the two track road and go 0.25 to a locked gate (get combination). Go through the gate and go 1.65 miles, staying on the main road, to a fork. Go left 0.45 miles to another fork with a shack on the left. Go right for 1.9 miles to a fork. Turn right and go 1.6 miles to a two track road on the right. Go 0.3 miles on the two track to a witness post on the right (north). The 0-foot stake is 15 feet north of the witness post. The study is marked by green, steel fenceposts approximately 12-18 inches in height.

### Site Information

Land Ownership Private  
Allotment -  
Elevation 8,090ft (2,466m)  
Aspect Northwest  
Slope 4-7%  
Sample Dates 08/14/1997, 07/09/2003, 08/05/2008, 08/07/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer; Elk, Substantial Summer, Calving; Sage-Grouse, Habitat Not Winter

#### VEGETATION HISTORY--

Management unit 27, Study no: 12

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1997-2013	Bitterbrush/Mix Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

The browse tag number needs to be collected during the next sampling. The site is privately owned and is part of the Alton CWMU. Several deer have been seen near the study site and were noted in 1997 and 2013 sample years.

### Site Potential

1981-2010 Average Annual Precipitation 22 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site Mountain Stony Loam (Antelope Bitterbrush)  
NRCS Ecological Site # R047XB456UT

#### SOIL ANALYSIS DATA--

Management unit 27, Study no: 12

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	64.0	16.1	19.9	5.9	0.4	2.7	19.1	134.4	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Stony Loam \(Antelope Bitterbrush\), R047XA456UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1997, the site has remained in a stable state with antelope bitterbrush (*Purshia tridentata*) being the dominant component with a mixture of other mountain brush species contributing a substantial amount of cover. The mixed mountain brush species include the following: black sagebrush (*Artemisia nova*), mountain big sagebrush (*A. tridentata* ssp. *vaseyana*), Gambel oak (*Quercus gambelii*), and mountain snowberry (*Symphoricarpos oreophilus*) (Table - Browse Trends). The herbaceous understory has been diverse and fairly abundant on the study site (Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 27, study no: 12

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1997	30.0	13.2	11.9	30.0	0.0	7.9	0.0	<b>93.0</b>	Excellent
2003	30.0	12.1	5.9	19.1	0.0	6.6	0.0	<b>73.7</b>	Good
2008	30.0	8.8	6.1	25.0	0.0	8.8	0.0	<b>78.7</b>	Good-Excellent
2013	30.0	14.2	5.5	30.0	0.0	5.4	0.0	<b>85.1</b>	Excellent

## HERBACEOUS TRENDS--

Management unit 27, Study no: 12

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Agropyron dasystachyum	ab50	ab42	a25	b64	.77	.24	.24	.73
G	Agropyron trachycaulum	7	7	2	-	.18	.09	.01	-
G	Bouteloua gracilis	a31	a25	a53	b80	.91	.16	1.42	2.83
G	Bromus carinatus	2	2	6	-	.00	.03	.03	-
G	Carex sp.	ab19	a3	ab13	b19	.06	.03	.18	.31
G	Koeleria cristata	a24	a29	b70	a5	.24	.30	1.26	.16
G	Poa fendleriana	a47	b114	bc144	c204	1.34	1.34	2.67	6.22
G	Poa pratensis	-	3	5	7	-	.01	.06	.06
G	Poa secunda	c133	b80	a35	a9	1.30	1.40	.36	.21
G	Sitanion hystrix	ab32	ab20	a10	b29	.30	.32	.10	.18
G	Stipa comata	95	133	109	87	1.57	2.22	1.32	1.95
G	Stipa lettermani	b305	a157	b248	a174	11.75	3.38	4.82	4.72
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		745	615	720	678	18.45	9.55	12.50	17.39
Total for Grasses		745	615	720	678	18.45	9.55	12.50	17.39
F	Agoseris glauca	a3	b31	a4	a3	.00	.29	.03	.03
F	Allium sp.	4	1	2	-	.01	.00	.00	-
F	Alyssum alyssoides (a)	-	6	2	-	-	.09	.00	-
F	Androsace septentrionalis (a)	a-	b33	a4	b18	-	.41	.00	.07
F	Antennaria sp.	1	3	1	1	.00	.18	.15	.03
F	Arabis sp.	-	2	4	7	-	.00	.01	.01
F	Artemesia carruthii	a3	a5	a-	b54	.03	.19	-	.46
F	Artemisia ludoviciana	b88	b76	b94	a14	1.41	.63	1.07	.07
F	Astragalus purshii	-	-	1	9	-	-	.00	.04
F	Balsamorhiza sagittata	1	2	1	2	.15	.15	.03	.15
F	Calochortus nuttallii	-	4	-	-	-	.01	-	-
F	Cirsium sp.	4	4	2	2	.03	.06	.06	.03
F	Collinsia parviflora (a)	-	-	-	3	-	-	-	.00
F	Cordylanthus sp. (a)	-	-	-	3	-	-	-	.03
F	Crepis acuminata	a-	b9	ab3	a-	-	.05	.15	-



Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
F	<i>Descurainia pinnata</i> (a)	-	-	-	-	-	.00	-	-
F	<i>Epilobium brachycarpum</i> (a)	<sub>a</sub> 1	<sub>b</sub> 23	<sub>a</sub> -	<sub>a</sub> -	.00	.03	-	-
F	<i>Erigeron eatonii</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 18	<sub>a</sub> -	-	.00	.03	-
F	<i>Erigeron flagellaris</i>	15	7	2	4	.36	.06	.00	.04
F	<i>Eriogonum racemosum</i>	118	80	94	107	1.52	1.19	1.40	1.08
F	<i>Eriogonum umbellatum</i>	6	17	15	13	.18	.23	.42	.07
F	<i>Lappula occidentalis</i> (a)	-	1	-	2	-	.00	-	.00
F	<i>Lomatium</i> sp.	5	8	-	-	.01	.01	-	-
F	<i>Lychnis drummondii</i>	4	2	1	-	.03	.01	.00	-
F	<i>Microsteris gracilis</i> (a)	-	4	-	-	-	.01	-	-
F	<i>Orthocarpus luteus</i> (a)	-	3	2	-	-	.03	.03	-
F	<i>Phlox longifolia</i>	<sub>a</sub> 33	<sub>b</sub> 80	<sub>c</sub> 140	<sub>a</sub> 30	.10	.17	.59	.08
F	<i>Polygonum douglasii</i> (a)	<sub>c</sub> 62	<sub>a</sub> 4	<sub>bc</sub> 44	<sub>ab</sub> 22	.18	.01	.09	.07
F	<i>Potentilla gracilis</i>	1	2	2	1	.03	.03	.03	.00
F	<i>Senecio douglasii</i>	-	-	4	-	-	.00	.30	-
F	<i>Senecio spartioides</i>	-	-	-	4	-	-	-	.53
F	<i>Stellaria jamesiana</i>	-	2	-	-	-	.00	-	-
F	<i>Taraxacum officinale</i>	<sub>ab</sub> 5	<sub>a</sub> -	<sub>b</sub> 12	<sub>a</sub> 4	.06	-	.09	.03
F	<i>Tragopogon dubius</i> (a)	6	9	-	-	.02	.04	-	-
Total for Annual Forbs		69	83	52	48	0.20	0.65	0.13	0.19
Total for Perennial Forbs		291	335	400	255	3.95	3.31	4.41	2.69
Total for Forbs		360	418	452	303	4.16	3.96	4.55	2.88

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

#### BROWSE TRENDS--

Management unit 27, Study no: 12

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	<i>Amelanchier utahensis</i>	-	.15	.15	-	.06	.63	-
B	<i>Artemisia nova</i>	2.55	2.40	4.71	4.73	5.25	7.33	7.01
B	<i>Artemisia tridentata vaseyana</i>	2.17	2.33	3.38	4.04	2.90	5.18	3.03
B	<i>Chrysothamnus depressus</i>	.73	1.28	.96	.54	.56	.40	1.33
B	<i>Chrysothamnus nauseosus hololeucus</i>	.51	.18	.03	-	.18	-	-
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	5.56	4.54	3.10	3.35	7.71	6.11	6.53
B	<i>Gutierrezia sarothrae</i>	-	.10	1.04	.11	.21	1.58	-
B	<i>Mahonia repens</i>	.00	-	-	-	-	.03	.05
B	<i>Purshia tridentata</i>	17.35	15.26	15.72	17.01	17.45	18.76	21.36
B	<i>Quercus gambelii</i>	1.16	1.16	.71	1.38	2.80	2.51	2.83
B	<i>Ribes cereum</i>	.15	.15	-	.30	.66	-	.13
B	<i>Rosa woodsii</i>	.15	.03	.03	-	-	-	-
B	<i>Symphoricarpos oreophilus</i>	10.24	7.29	9.32	9.40	8.20	9.14	8.08

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Tetradymia canescens	-	.03	.15	.03	.16	.05	-
Total for Browse		40.59	34.93	39.32	40.90	46.14	51.72	50.35

BASIC COVER--

Management unit 27, Study no: 12

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	62.22	49.17	54.87	60.55
Rock	1.33	2.30	2.25	2.01
Pavement	1.18	.93	2.17	1.38
Litter	55.81	42.33	42.34	49.19
Cryptogams	.49	.03	.36	.19
Bare Ground	7.05	21.56	17.62	11.63

PELLET GROUP DATA--

Management unit 27, Study no: 12

Type	Quadrat Frequency			
	'97	'03	'08	'13
Rabbit	3	11	24	8
Elk	8	-	13	-
Deer	45	34	55	44
Cattle	14	4	10	6

Days use per acre (ha)		
'03	'08	'13
-	-	-
-	10 (25)	5 (12)
96 (238)	127 (312)	114 (281)
15 (26)	31 (77)	20 (50)

BROWSE CHARACTERISTICS--

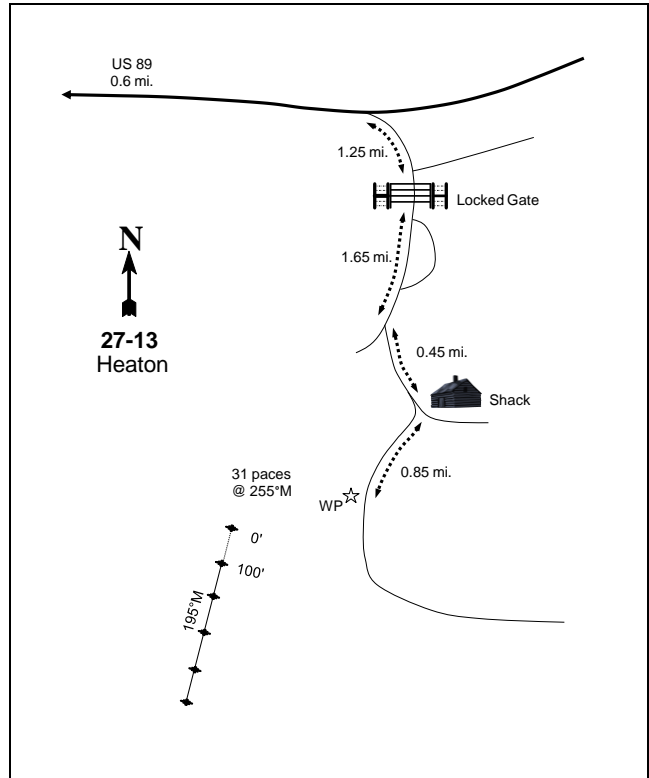
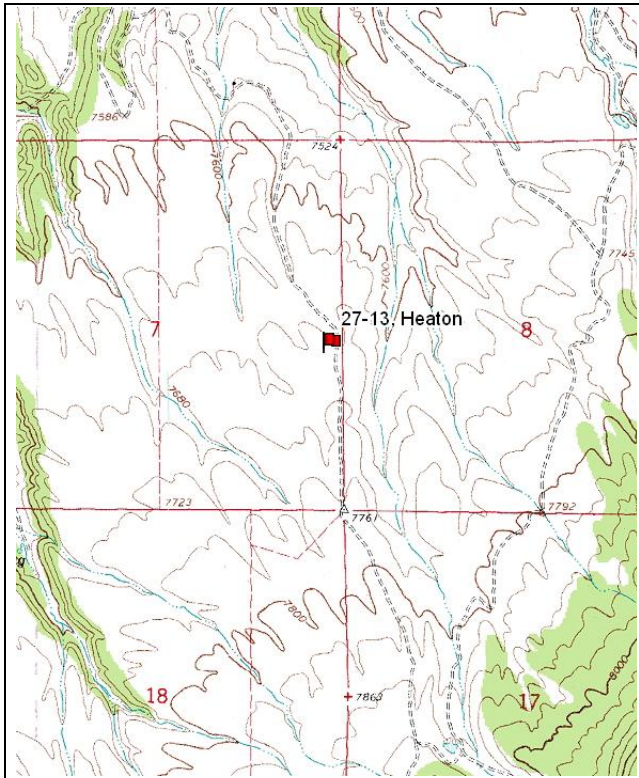
Management unit 27, Study no: 12

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
97	<b>0</b>	0	0	-	-	0	0	0	93/78
03	<b>40</b>	50	50	-	-	0	50	0	4/17
08	<b>80</b>	0	100	-	-	25	75	0	57/47
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Artemisia nova</b>									
97	<b>980</b>	47	45	8	420	14	4	6	18/36
03	<b>1540</b>	32	62	5	-	1	1	0	22/26
08	<b>1660</b>	19	60	20	780	18	0	7	20/30
13	<b>1380</b>	4	90	6	-	29	6	14	15/23
<b>Artemisia tridentata vaseyana</b>									
97	<b>560</b>	50	43	7	100	14	0	4	26/38
03	<b>880</b>	43	45	11	40	14	5	5	25/29
08	<b>900</b>	44	44	11	220	13	7	0	24/36
13	<b>740</b>	19	78	3	80	43	16	22	17/21

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus depressus</b>									
97	<b>760</b>	24	76	0	-	0	0	0	4/8
03	<b>380</b>	0	100	0	-	47	53	0	6/10
08	<b>1720</b>	5	71	24	-	14	38	2	3/10
13	<b>1240</b>	3	97	0	-	13	13	0	5/16
<b>Chrysothamnus nauseosus hololeucus</b>									
97	<b>360</b>	6	94	0	-	0	0	0	12/16
03	<b>60</b>	0	100	0	-	0	0	0	12/17
08	<b>380</b>	5	89	5	-	0	0	0	13/12
13	<b>0</b>	0	0	0	-	0	0	0	23/51
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
97	<b>2080</b>	13	88	0	-	0	0	0	19/27
03	<b>2220</b>	4	95	1	-	0	0	0	19/26
08	<b>1840</b>	0	98	2	-	7	0	2	16/23
13	<b>1800</b>	2	98	0	20	7	3	12	15/21
<b>Eriogonum microthecum</b>									
97	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	6/23
<b>Gutierrezia sarothrae</b>									
97	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>460</b>	0	100	0	-	0	0	0	6/7
08	<b>2140</b>	1	92	7	-	0	0	3	7/9
13	<b>940</b>	2	98	0	-	0	0	0	7/8
<b>Mahonia repens</b>									
97	<b>200</b>	0	100	-	-	0	0	0	3/6
03	<b>140</b>	0	100	-	-	0	0	0	3/6
08	<b>340</b>	0	100	-	-	0	0	0	3/5
13	<b>360</b>	0	100	-	-	0	0	0	4/5
<b>Purshia tridentata</b>									
97	<b>1860</b>	14	80	6	20	25	70	1	23/70
03	<b>2160</b>	4	85	11	-	16	78	2	20/46
08	<b>2400</b>	3	73	23	160	13	77	6	17/45
13	<b>2620</b>	5	94	2	80	4	85	11	19/44
<b>Quercus gambelii</b>									
97	<b>500</b>	72	24	4	80	32	0	4	98/32
03	<b>480</b>	21	79	0	-	8	54	0	70/29
08	<b>1440</b>	33	64	3	200	0	0	0	42/38
13	<b>800</b>	88	13	0	60	0	5	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Ribes cereum</b>										
97	<b>40</b>	0	100	0	-	50	0	0	46/61	
03	<b>40</b>	0	50	50	-	50	50	0	53/52	
08	<b>20</b>	0	0	100	-	0	0	100	48/54	
13	<b>40</b>	0	50	50	20	50	0	50	43/59	
<b>Rosa woodsii</b>										
97	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>40</b>	50	50	-	-	0	0	0	16/9	
08	<b>140</b>	0	100	-	-	0	0	0	9/7	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<b>Symphoricarpos oreophilus</b>										
97	<b>880</b>	7	93	0	-	59	9	0	25/57	
03	<b>1280</b>	6	89	5	-	11	9	2	20/40	
08	<b>1420</b>	14	80	6	-	3	7	0	17/39	
13	<b>1780</b>	34	66	0	260	24	18	3	19/44	
<b>Tetradymia canescens</b>										
97	<b>80</b>	75	25	-	20	0	0	0	10/13	
03	<b>160</b>	38	63	-	-	0	0	0	15/16	
08	<b>100</b>	0	100	-	-	0	0	0	13/8	
13	<b>20</b>	0	100	-	-	0	0	0	17/18	

## HEATON - TREND STUDY NO. 27-13



### Location Information

USGS 7.5 min Map Info  
GPS (0' Stake)

George Mountain; Township 38S, Range 5W, Section 7  
NAD 83, UTM Zone 12, 371747 East 4153528 North

### Transect Information

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

289  
195° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) Line 5 (95ft)  
Standard

### Directions to Site

From US 89, go approximately 0.4 miles south of mile marker 111 to a road on the left. Go 0.6 miles to a fork. Stay on Bryce Woodland Road (right) and go 1 mile to a fork. Continue straight and go 0.25 to a locked gate (get combination). Go through the gate and go 1.65 miles, staying on the main road, to a fork. Go left 0.45 miles to another fork with a shack on the left. Go right for 0.85 miles to a witness post on the right (west). From the witness post walk 31 paces at 255 degrees magnetic to the 0-foot stake. The 0-foot stake was marked by browse tag #289. The study is marked by green, steel fenceposts approximately 12-18 inches in height.

**Site Information**

Land Ownership Private  
 Allotment -  
 Elevation 7,680ft (2,341m)  
 Aspect North  
 Slope 3%  
 Sample Dates 08/19/1997, 07/09/2003, 08/05/2008, 08/07/2013

**DISTURBANCE HISTORY--**

Management unit 27, Study no: 13

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Aerator	-	-	1997-2003	-
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer; Elk, Substantial Summer, Calving; Sage-Grouse, Habitat Not Winter

**VEGETATION HISTORY--**

Management unit 27, Study no: 13

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1997-2003	Black Sagebrush	No Encroachment
2008-2013	Black Sagebrush/Bitterbrush	No Encroachment

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The site is privately owned and is part of the Alton CWMU. Several deer have been seen near the study site and were noted in the 1997 and 2013 sample years. Pellet group data show heavy deer and cattle use in all years sampled except 2003 for cattle (Table – Pellet Group Data). The site was aerated between 1997-2003 sample years, but is also appears the site was sprayed with herbicide to decrease sagebrush cover.

**Site Potential**

1981-2010 Average Annual Precipitation 20 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Black Sagebrush)  
 NRCS Ecological Site # R047XB426UT

**SOIL ANALYSIS DATA--**

Management unit 27, Study no: 13

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	65.0	19.2	15.8	6.1	0.4	2.1	13.4	131.2	1997

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions: No state and transition model is available for the above ecological site.

When established in 1997, black sagebrush (*Artemisia nova*) was the dominant shrub of the site with a minor shrub component of antelope bitterbrush (*Purshia tridentata*) (Table - Browse Trends). The herbaceous understory was diverse and vigorous (Table - Herbaceous Trends). Following the treatment, cover of black sagebrush decreased and bitterbrush increased, though density remained similar. The site has transitioned to a

mixed black sagebrush and bitterbrush state with a good herbaceous understory (Table - Browse Trends, Table - Browse Characteristics).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 27, 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
1997	30.0	11.9	12.9	24.2	0.0	3.0	0.0	<b>81.9</b>	Good-Excellent
2003	26.1	12.2	10.4	17.8	0.0	1.1	0.0	<b>67.5</b>	Good
2008	19.6	8.9	15.0	22.4	0.0	4.3	0.0	<b>70.1</b>	Good
2013	22.3	14.0	8.0	30.0	0.0	4.6	0.0	<b>78.9</b>	Good-Excellent

#### HERBACEOUS TRENDS--

Management unit 27, Study no: 13

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
G	Agropyron cristatum	4	6	13	11	.53	.30	.18	.33
G	Agropyron dasystachyum	a23	a26	ab31	b74	.07	.45	.38	.88
G	Agropyron intermedium	-	-	-	9	-	-	-	.19
G	Bouteloua gracilis	a35	a15	b83	b108	.28	.11	2.54	7.37
G	Koeleria cristata	c155	b92	b80	a31	2.65	1.73	1.01	.77
G	Poa fendleriana	b273	a194	a140	a178	6.67	4.59	2.83	6.64
G	Poa pratensis	-	-	-	5	-	-	-	.15
G	Poa secunda	a6	a4	b22	a6	.15	.00	.17	.18
G	Sitanion hystrix	a-	a2	b8	c28	-	.06	.11	.58
G	Stipa comata	a90	a103	b158	b188	1.13	1.64	3.94	8.10
G	Stipa lettermani	b29	a-	a-	a-	.59	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		615	442	535	638	12.09	8.91	11.18	25.21
Total for Grasses		615	442	535	638	12.09	8.91	11.18	25.21
F	Agoseris glauca	a-	b13	a-	ab4	-	.03	-	.01
F	Allium sp.	1	-	-	2	.00	-	-	.00
F	Antennaria sp.	ab13	a1	b22	ab7	.21	.00	.09	.21
F	Arabis sp.	2	-	-	4	.00	-	-	.01
F	Astragalus humistratus	b41	a-	b21	b23	.37	-	.53	.73
F	Calochortus nuttallii	1	-	-	-	.00	-	-	-
F	Castilleja linariaefolia	2	1	-	3	.00	.00	-	.00
F	Chenopodium leptophyllum(a)	-	-	11	-	-	-	.02	-
F	Cirsium sp.	a5	a-	a3	b22	.00	-	.03	.31
F	Collinsia parviflora (a)	b12	c123	b35	a-	.05	.52	.11	-
F	Crepis acuminata	-	2	-	-	-	.00	-	-
F	Erigeron sp.	-	-	-	3	-	-	-	.00
F	Eriogonum racemosum	31	20	41	36	.37	.29	.53	.43
F	Eriogonum umbellatum	ab7	b13	a-	a-	.03	.08	-	-

Type	Species	Nested Frequency				Average Cover %			
		'97	'03	'08	'13	'97	'03	'08	'13
F	Gayophytum ramosissimum(a)	a-	a <sup>5</sup>	b <sup>68</sup>	a-	-	.04	.57	-
F	Gilia sp. (a)	8	-	-	-	.04	-	-	-
F	Lactuca serriola (a)	-	-	-	3	-	-	-	.01
F	Lepidium densiflorum (a)	-	-	-	5	-	-	-	.02
F	Lepidium sp. (a)	-	9	-	-	-	.01	-	-
F	Lomatium sp.	3	-	2	-	.03	-	.00	-
F	Lotus utahensis	b <sup>45</sup>	a <sup>6</sup>	a <sup>15</sup>	a <sup>9</sup>	.22	.01	.09	.03
F	Lychnis drummondii	-	2	-	-	-	.00	-	-
F	Microsteris gracilis (a)	a-	b <sup>14</sup>	a <sup>4</sup>	a-	-	.09	.01	-
F	Oenothera sp.	1	-	-	-	.00	-	-	-
F	Orthocarpus luteus (a)	3	7	1	-	.01	.06	.00	-
F	Penstemon comarrhenus	a-	a-	b <sup>24</sup>	b <sup>18</sup>	-	-	.14	.34
F	Penstemon pachyphyllus	-	-	2	-	-	-	.00	-
F	Penstemon sp.	b <sup>22</sup>	a <sup>2</sup>	a-	a-	.09	.01	-	-
F	Phlox longifolia	a <sup>43</sup>	a <sup>51</sup>	b <sup>130</sup>	a <sup>44</sup>	.14	.09	.66	.15
F	Polygonum douglasii (a)	b <sup>44</sup>	a <sup>9</sup>	b <sup>48</sup>	ab <sup>23</sup>	.08	.01	.13	.07
F	Potentilla gracilis	-	-	2	-	-	-	.03	-
F	Potentilla hippiana	-	-	-	1	-	-	-	.03
F	Senecio spartioides	-	-	-	-	-	-	-	.03
F	Stellaria jamesiana	-	-	3	-	-	-	.00	-
F	Taraxacum officinale	-	-	-	3	-	-	-	.01
F	Tragopogon dubius (a)	-	-	-	5	-	-	-	.01
F	Trifolium sp.	-	-	-	1	-	-	-	.00
Total for Annual Forbs		67	167	167	36	0.19	0.75	0.85	0.11
Total for Perennial Forbs		217	111	265	180	1.51	0.54	2.15	2.32
Total for Forbs		284	278	432	216	1.70	1.29	3.01	2.44

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

#### BROWSE TRENDS--

Management unit 27, Study no: 13

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'97	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	.03	-	-	-	-	-	-
B	Artemisia nova	24.60	15.75	11.00	8.41	17.88	10.56	14.88
B	Chrysothamnus depressus	.24	.03	.00	.15	.23	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	.55	.66	1.08	2.17	.85	1.85	4.80
B	Eriogonum microthecum	-	-	-	.00	-	-	-
B	Gutierrezia sarothrae	-	.39	.03	-	-	.36	-
B	Opuntia sp.	.18	.00	.03	.06	-	.03	-
B	Purshia tridentata	10.25	4.25	3.89	7.76	3.76	6.15	11.90
B	Tetradymia canescens	-	.06	-	.15	.11	-	.06
Total for Browse		35.86	21.15	16.04	18.73	22.83	18.95	31.64



**BASIC COVER--**

Management unit 27, Study no: 13

Cover Type	Average Cover %			
	'97	'03	'08	'13
Vegetation	49.70	32.78	28.83	41.84
Rock	.14	.22	.30	.04
Pavement	3.04	3.96	1.67	1.04
Litter	53.33	42.73	51.96	41.08
Cryptogams	.06	.03	.15	.03
Bare Ground	20.91	28.71	28.53	23.26

**PELLET GROUP DATA--**

Management unit 27, Study no: 13

Type	Quadrat Frequency				Days use per acre (ha)		
	'97	'03	'08	'13	'03	'08	'13
Rabbit	3	2	39	-	-	-	-
Elk	8	2	5	2	2 (5)	7 (17)	1 (2)
Deer	51	19	42	31	45 (111)	83 (205)	57 (141)
Cattle	13	5	16	9	25 (61)	92 (227)	45 (111)

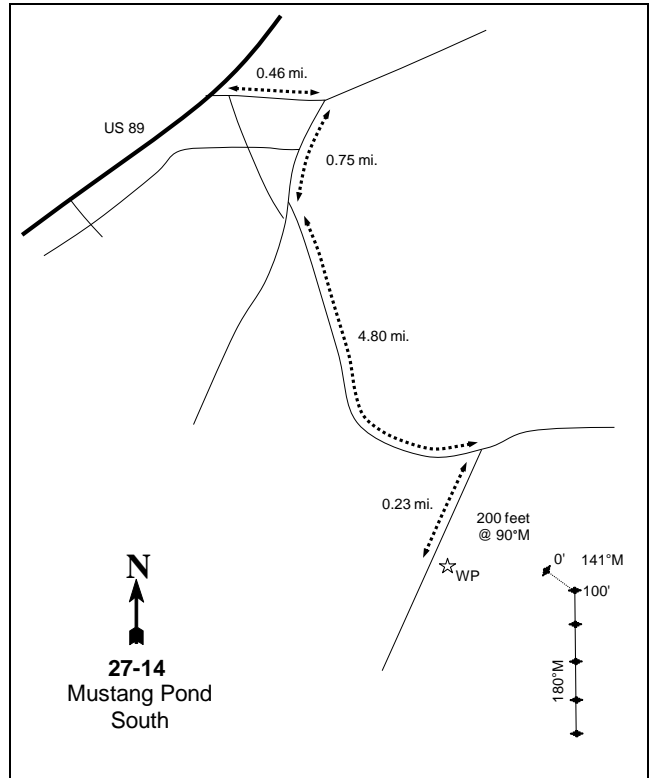
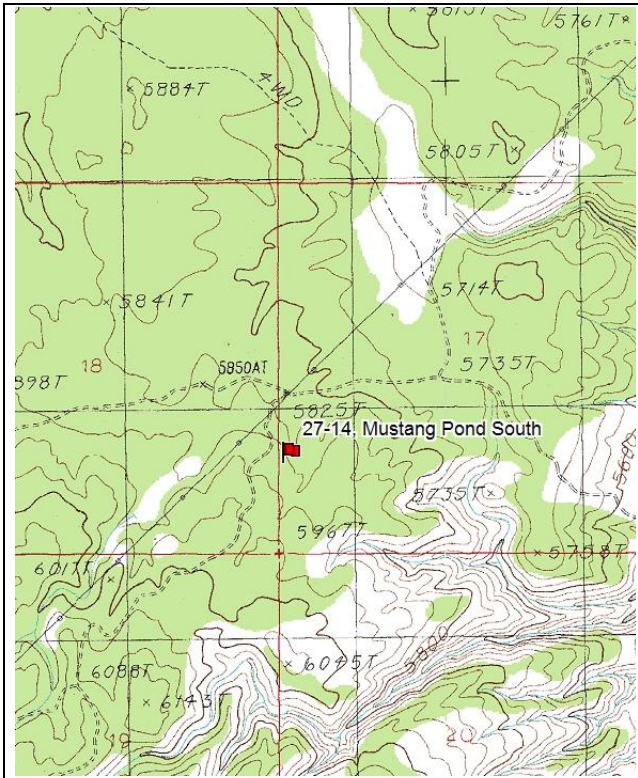
**BROWSE CHARACTERISTICS--**

Management unit 27, 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		
<b>Amelanchier utahensis</b>									
97	<b>20</b>	0	100	-	20	0	100	0	-/-
03	<b>40</b>	50	50	-	-	0	50	50	26/33
08	<b>20</b>	100	0	-	40	0	0	0	12/19
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Artemisia nova</b>									
97	<b>8800</b>	32	56	12	2180	10	2	7	15/28
03	<b>11140</b>	25	66	9	20	4	2	29	15/21
08	<b>8520</b>	47	30	23	2900	9	3	14	11/16
13	<b>4500</b>	17	80	4	120	32	10	3	12/19
<b>Chrysothamnus depressus</b>									
97	<b>240</b>	8	92	-	-	0	0	0	6/10
03	<b>60</b>	0	100	-	-	0	100	0	6/8
08	<b>40</b>	0	100	-	-	0	100	0	3/4
13	<b>260</b>	8	92	-	20	38	0	62	5/6
<b>Chrysothamnus nauseosus hololeucus</b>									
97	<b>20</b>	0	100	-	-	0	0	0	24/30
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	4/6
13	<b>0</b>	0	0	-	-	0	0	0	-/-

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>Chrysothamnus viscidiflorus viscidiflorus</i>									
97	1060	11	89	0	-	0	0	0	6/11
03	1440	6	92	3	-	0	0	14	7/12
08	2480	3	81	15	-	8	0	11	8/16
13	3080	11	88	1	-	17	0	29	7/14
<i>Eriogonum microthecum</i>									
97	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	1/15
<i>Gutierrezia sarothrae</i>									
97	20	0	100	0	-	0	0	0	-/-
03	360	0	100	0	-	0	0	6	5/10
08	60	0	0	100	-	0	0	100	5/11
13	0	0	0	0	-	0	0	0	-/-
<i>Opuntia sp.</i>									
97	160	25	63	13	-	0	0	13	4/13
03	60	0	100	0	-	0	0	0	3/8
08	140	0	100	0	20	0	0	0	4/13
13	200	20	80	0	-	0	0	50	3/10
<i>Purshia tridentata</i>									
97	1220	11	82	7	180	61	21	3	22/51
03	1280	5	84	11	-	36	61	53	16/32
08	1280	3	84	13	60	23	63	6	18/37
13	1480	15	82	3	360	16	70	19	21/50
<i>Rosa woodsii</i>									
97	20	0	0	100	-	0	0	100	-/-
03	0	0	0	0	-	0	0	0	8/6
08	0	0	0	0	-	0	0	0	7/5
13	0	0	0	0	-	0	0	0	11/9
<i>Symphoricarpos oreophilus</i>									
97	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	100	0	12/17
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	15/26
<i>Tetradymia canescens</i>									
97	20	0	100	0	-	0	0	0	-/-
03	40	0	100	0	-	0	0	0	7/10
08	20	0	0	100	-	0	0	100	8/11
13	40	0	100	0	-	0	0	0	9/12

MUSTANG POND SOUTH - TREND STUDY NO. 27-14



**Location Information**

USGS 7.5 min Map Info Pine Hollow Canyon; Township 43S, Range 2W, Section 17  
 GPS (0' Stake) NAD 83, UTM Zone 12, 406627 East 4102963 North

**Transect Information**

Browse Tag # (0' Stake) 693  
 Transect Bearing 141° magnetic (Line 2-5: 180° magnetic)  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the junction of 100 E and 300 S on US 89 in Kanab, drive north 24.1 miles. Turn left and head south on a dirt road. After passing the cattle guard, take a left onto county road 4153. Keep right on this road for 0.6 miles and turn right onto county road 4150. Follow this road for approximately 5.5 miles and turn right onto county road 4130. Drive 0.2 miles to a witness post on the south side of the road. The transect is approximately 200 feet from the witness post at a 90 degree bearing. The 0-foot stake is marked with a browse tag #693. The transect doglegs at the 100 foot stake.

### Site Information

Land Ownership BLM  
Allotment Mollies Nipple  
Elevation 5,888ft (1,795m)  
Aspect East  
Slope 24%  
Sample Dates 08/06/2013

### DISTURBANCE HISTORY--

Management unit 27, Study no: 14

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Lop and Scatter	Buckskin Lop and Scatter FY12	<a href="#">2002</a>	Fall 2011	604

The table is a recorded disturbance history of the study site.

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter

### VEGETATION HISTORY--

Management unit 27, Study no: 14

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2013	Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

The first 100ft of the transect is an annual habitat monitoring site. Soil data was not sampled on the site, but will be collected in the future.

### Site Potential

1981-2010 Average Annual Precipitation 11 inches  
NRCS Taxonomical soil Classification Loamy-skeletal, mixed, superactive, mesic Lithic Haplustalfs  
NRCS Ecological Site Upland Shallow Loam (Cliffrose)  
NRCS Ecological Site # R035XY313UT

### States and Transitions

No state and transition model is available for the above ecological site.

When established in 2013, the site was a stand of black sagebrush (*Artemisia nova*) with a minor component of Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) scattered across the site (Table - Browse Trends, Table - Browse Characteristics). The herbaceous understory was in poor condition with cheatgrass (*Bromus tectorum*) being the dominant component (Table - Herbaceous Trends). Prior to the establishment of the study pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) were removed with lop and scatter treatment (Table - Disturbance History).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
 Management unit 27, study no: 14

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2013	8.8	7.1	6.7	3.1	-2.8	1.0	0.0	<b>23.8</b>	Poor-Fair

## HERBACEOUS TRENDS--

Management unit 27, Study no: 14

Type	Species	Nested Frequency '13	Average Cover % '13
G	<i>Bouteloua gracilis</i>	1	.03
G	<i>Bromus tectorum</i> (a)	243	3.78
G	<i>Oryzopsis hymenoides</i>	1	.01
G	<i>Poa fendleriana</i>	4	.03
G	<i>Poa secunda</i>	50	.18
G	<i>Sitanion hystrix</i>	34	.31
G	<i>Stipa comata</i>	9	.98
Total for Annual Grasses		243	3.78
Total for Perennial Grasses		99	1.55
Total for Grasses		342	5.33
F	<i>Astragalus</i> sp.	3	.00
F	<i>Draba</i> sp. (a)	2	.00
F	<i>Eriogonum cernuum</i> (a)	6	.19
F	<i>Euphorbia</i> sp.	3	.00
F	<i>Sphaeralcea parvifolia</i>	4	.49
Total for Annual Forbs		8	0.19
Total for Perennial Forbs		10	0.50
Total for Forbs		18	0.70

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

BROWSE TRENDS--

Management unit 27, Study no: 14

Type	Species	Quadrat	Line
		Cover %	Intercept
		'13	'13
B	Artemisia nova	5.52	7.83
B	Artemisia tridentata wyomingensis	1.15	1.10
B	Chrysothamnus viscidiflorus	.18	.41
B	Cowania mexicana stansburiana	.30	.30
B	Gutierrezia sarothrae	.15	.11
B	Juniperus osteosperma	.38	.03
Total for Browse		7.68	9.78

BASIC COVER--

Management unit 27, Study no: 14

Cover Type	Average
	Cover %
	'13
Vegetation	14.13
Rock	18.02
Pavement	13.21
Litter	47.74
Cryptogams	.22
Bare Ground	18.26

PELLET GROUP DATA--

Management unit 27, Study no: 14

Type	Quadrat	Days use
	Frequency	
		per acre
		(ha)
		'13
Rabbit	3	-
Deer	44	108 (268)
Cattle	7	6 (14)

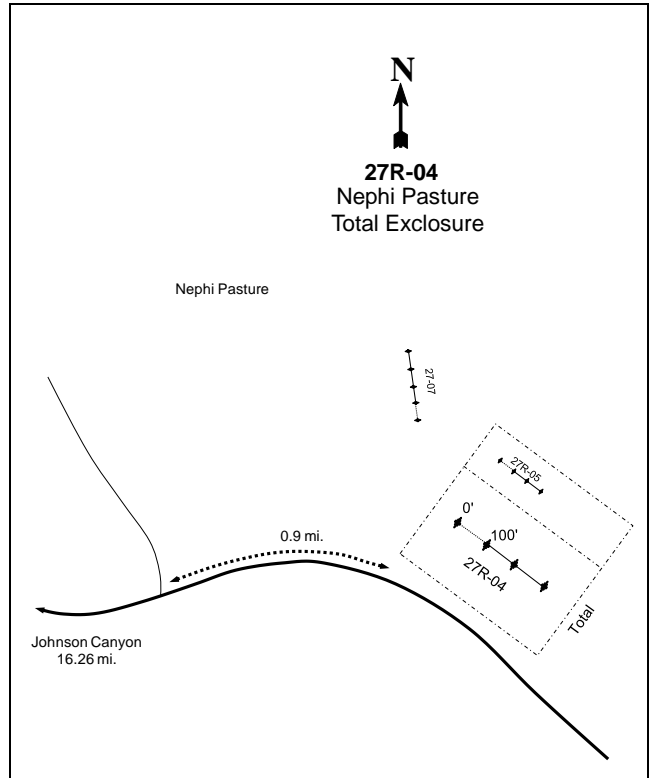
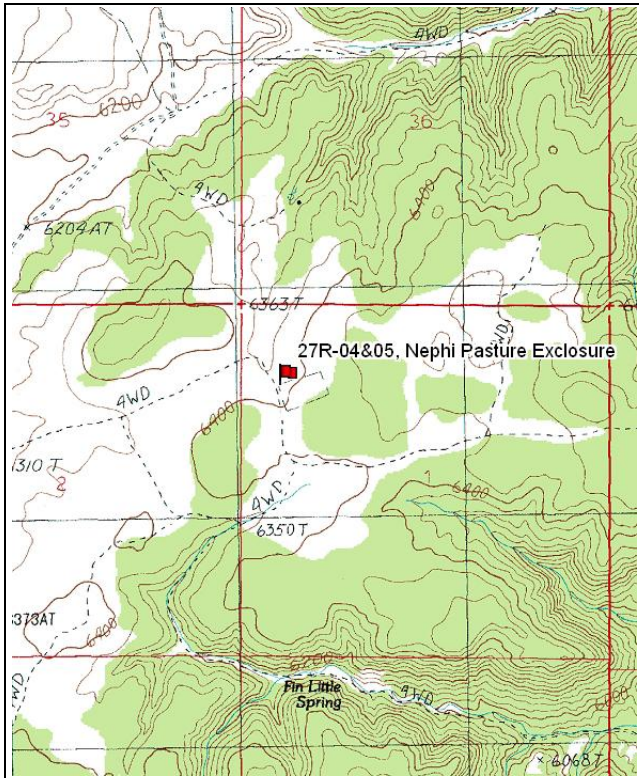
BROWSE CHARACTERISTICS--

Management unit 27, Study no: 14

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	%	%	%	Seedling (plants/acre)	%	%	% poor vigor	Average Height Crown (in)	
		Young	Mature	Decadent		moderate	heavy			
Artemisia nova										
13	<b>2740</b>	10	64	26	60	27	34	18	12/26	
Artemisia tridentata wyomingensis										
13	<b>540</b>	33	44	22	-	7	37	19	18/29	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Chrysothamnus viscidiflorus</i>										
13	<b>100</b>	0	100	-	-	0	0	0	13/26	
<i>Cowania mexicana stansburiana</i>										
13	<b>120</b>	0	50	50	-	33	17	67	66/62	
<i>Ephedra viridis</i>										
13	<b>100</b>	40	60	-	-	0	0	20	22/35	
<i>Gutierrezia sarothrae</i>										
13	<b>220</b>	0	100	-	-	0	0	0	9/15	
<i>Juniperus osteosperma</i>										
13	<b>40</b>	100	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
13	<b>160</b>	13	75	13	-	0	0	13	9/21	
<i>Yucca baccata</i>										
13	<b>0</b>	0	0	-	-	0	0	0	24/29	

NEPHI PASTURE TOTAL ENCLOSURE - TREND STUDY NO. 27R-4



**Location Information**

USGS 7.5 min Map Info      Nephi Point; Township 42S, Range 4W, Section 1  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 394135 East 4116779 North

**Transect Information**

Browse Tag # (0' Stake)      Not Available  
 Transect Bearing              142° magnetic  
 Length                          300ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (59ft), Line 3 (34ft & 71ft)  
 Belt Marker Placement      No Rebar

**Directions to Site**

From Kanab, take US 89 east for 9.4 miles to Johnson Canyon road. Travel north on Johnson Canyon road for 9.75 miles to the Lock Ridge-Nephi Pasture road. Turn right and go 16.25 miles (see 27-6-03 for more detail) on the main road to a major intersection in Nephi Pasture. Continue straight towards Nephi Point, going 0.9 miles to an enclosure. From the northwest corner of the enclosure, count up five posts to the 0 foot baseline on the inside of the enclosure. The baseline runs at 142 degrees magnetic.



**Site Information**

Land Ownership BLM  
 Allotment Vermilion  
 Elevation 6,380ft (1,945m)  
 Aspect Northwest  
 Slope 11-13%  
 Sample Dates 08/12/1998, 07/30/2003, 07/31/2008, 07/23/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

VEGETATION HISTORY--

Management unit 27R, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Mixed Mountain Brush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This transect was established inside the total enclosure in 1998 as part of a three-way comparison between the different enclosure grazing treatments; no grazing in the total enclosure, wildlife use in the livestock enclosure, and open to all grazing animals outside the enclosure. Deer generally utilize the area at high levels during the winter. The total enclosure is designed to exclude all animals, but due to a hole in the fence, some deer were able to access the enclosure prior to both the 1998 and 2003 surveys, and had moderately hedged many of the preferred shrubs.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Sand (Mountain Big Sagebrush)  
 NRCS Ecological Site # R035XY307UT

SOIL ANALYSIS DATA--

Management unit 27R, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	74.2	18.0	7.8	5.9	0.4	0.7	8.2	25.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1998, the site has been a mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), Utah serviceberry (*Amelanchier utahensis*), and antelope bitterbrush (*Purshia tridentata*) with a limited herbaceous understory (Table - Browse Trends, Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have slowly increased on the site over the sample years (Table - Point-Quarter Tree Data). It is predicted that juniper will likely continue to encroach on the site and without disturbance will likely become the dominant species on the study site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 27R, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	26.3	4.0	8.0	6.9	-6.6	7.2	0.0	<b>45.8</b>	Poor
2003	24.6	2.8	0.0	1.7	0.0	6.1	0.0	<b>35.2</b>	Very Poor-Poor
2008	26.0	-4.1	1.2	0.0	0.0	9.4	0.0	<b>32.5</b>	Very Poor
2013	24.7	7.3	3.4	0.9	-0.1	7.6	0.0	<b>43.8</b>	Poor

## HERBACEOUS TRENDS--

Management unit 27R, Study no: 4

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron smithii	b56	b29	a-	a-	.76	.26	-	-
G	Agropyron spicatum	2	-	-	-	.03	-	-	-
G	Bromus tectorum (a)	c321	a-	ab7	b13	7.44	-	.01	.07
G	Oryzopsis hymenoides	3	6	-	-	.18	.23	-	-
G	Poa secunda	b37	a8	a1	a13	.43	.05	.00	.10
G	Sitanion hystrix	8	-	1	8	.04	-	.00	.24
G	Sporobolus cryptandrus	ab3	ab5	a-	b12	.06	.03	-	.12
G	Stipa comata	c60	b12	ab2	a-	1.92	.27	.00	-
G	Vulpia octoflora (a)	b144	a-	a11	a11	1.41	-	.02	.02
Total for Annual Grasses		465	0	18	24	8.85	0	0.03	0.09
Total for Perennial Grasses		169	60	4	33	3.44	0.85	0.01	0.47
Total for Grasses		634	60	22	57	12.29	0.85	0.04	0.56
F	Calochortus nuttallii	a-	b11	a-	a1	-	.05	-	.00
F	Chenopodium leptophyllum(a)	-	-	-	5	-	-	-	.18
F	Collinsia parviflora (a)	-	-	3	-	-	-	.00	-
F	Comandra pallida	b167	a132	b179	b192	3.33	2.77	4.65	3.70
F	Descurainia pinnata (a)	a11	a-	b68	b74	.07	-	.72	1.79
F	Erigeron sp.	6	-	-	-	.06	-	-	-
F	Eriogonum cernuum (a)	a5	a-	b35	a10	.03	-	.10	.02
F	Eriogonum racemosum	a-	ab8	a-	b8	-	.04	-	.02
F	Euphorbia sp.	-	-	13	4	-	-	.02	.00
F	Gilia sp. (a)	a-	b42	a2	a-	-	1.23	.00	-
F	Lappula occidentalis (a)	-	-	6	1	-	-	.02	.00
F	Lupinus sp.	5	-	-	-	.18	.15	-	-
F	Microsteris gracilis (a)	6	6	-	-	.03	.04	-	-
F	Penstemon sp.	-	-	2	2	-	-	.01	.03
F	Phlox austromontana	4	5	-	-	.03	.04	-	-
F	Plantago patagonica (a)	c66	a1	ab16	bc39	.76	.00	.04	.24
F	Polygonum douglasii (a)	a3	a-	b25	a-	.00	-	.06	-
F	Sphaeralcea parvifolia	1	-	1	2	.00	-	.00	.00

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
	Total for Annual Forbs	91	49	155	129	0.91	1.27	0.96	2.24
	Total for Perennial Forbs	183	156	195	209	3.60	3.06	4.69	3.78
	Total for Forbs	274	205	350	338	4.51	4.34	5.65	6.02

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

#### BROWSE TRENDS--

Management unit 27R, Study no: 4

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	1.04	3.75	3.12	2.74	5.36	4.31	4.58
B	Artemisia tridentata tridentata	10.35	7.36	8.64	9.39	8.63	11.95	8.78
B	Gutierrezia sarothrae	1.42	.15	.00	.00	.06	-	.21
B	Juniperus osteosperma	-	.63	2.01	1.42	.98	3.95	4.05
B	Opuntia sp.	.03	-	-	-	-	-	-
B	Purshia tridentata	7.90	6.50	7.02	5.93	5.80	8.34	9.41
	Total for Browse	20.74	18.40	20.80	19.50	20.83	28.55	27.03

#### BASIC COVER--

Management unit 27R, Study no: 4

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	41.18	23.88	27.65	26.60
Rock	0	0	.04	0
Pavement	.01	0	.12	.01
Litter	41.79	54.28	59.02	52.03
Cryptogams	11.46	2.98	2.64	.78
Bare Ground	23.24	34.92	29.30	35.68

#### PELLET GROUP DATA--

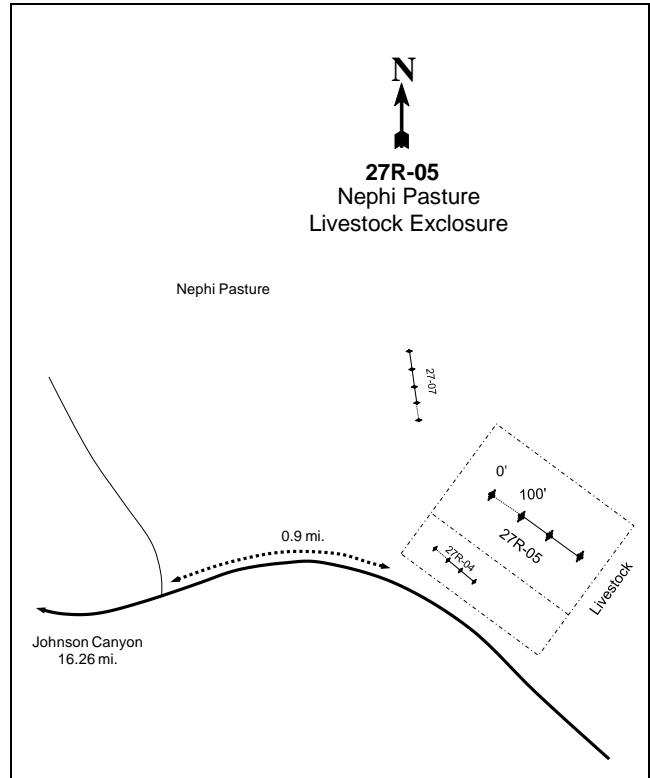
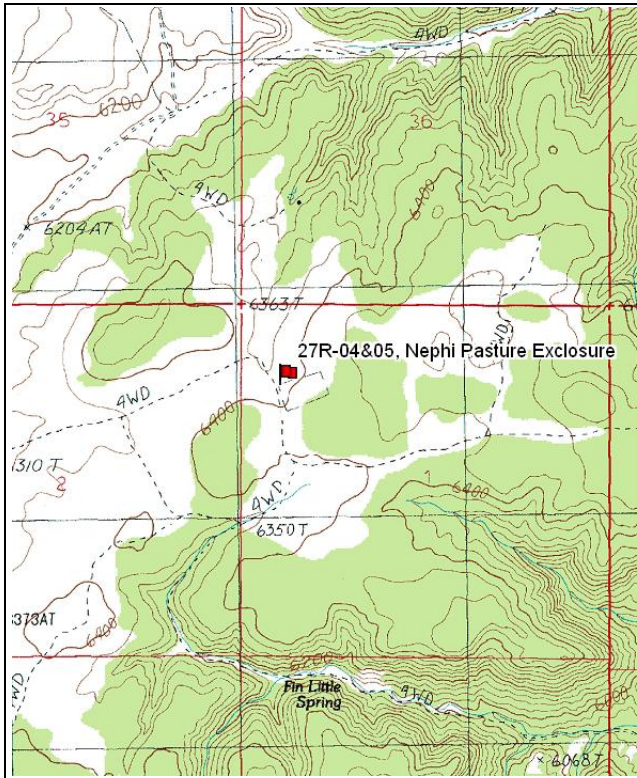
Management unit 27R, Study no: 4

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	14	31	88	46
Elk	1	-	-	-
Deer	22	14	10	-

BROWSE CHARACTERISTICS--  
Management unit 27R, Study no: 4

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
98	80	25	50	25	-	0	0	0	88/103	
03	60	0	67	33	-	33	0	0	84/90	
08	40	0	50	50	-	0	0	0	83/87	
13	60	0	100	0	-	0	0	33	68/89	
<i>Artemisia tridentata tridentata</i>										
98	2820	12	24	64	-	32	0	46	32/37	
03	1780	0	46	54	-	2	0	18	35/37	
08	1500	5	25	69	360	8	1	31	40/43	
13	1660	11	54	35	320	0	1	27	37/46	
<i>Cercocarpus montanus</i>										
98	0	0	0	-	-	0	0	0	39/49	
03	0	0	0	-	-	0	0	0	52/41	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
98	1580	5	92	3	-	0	0	3	10/11	
03	60	0	100	0	-	0	0	0	11/12	
08	20	100	0	0	-	0	0	0	-/-	
13	240	58	42	0	-	0	0	0	10/14	
<i>Juniperus osteosperma</i>										
98	40	100	0	-	-	0	0	0	-/-	
03	60	33	67	-	-	0	0	0	-/-	
08	60	33	67	-	-	0	0	0	-/-	
13	80	50	50	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	20	0	0	100	-	0	0	100	-/-	
03	0	0	0	0	-	0	0	0	-/-	
08	0	0	0	0	-	0	0	0	-/-	
13	0	0	0	0	-	0	0	0	1/12	
<i>Purshia tridentata</i>										
98	920	20	78	2	-	28	0	2	35/51	
03	740	0	70	30	-	14	5	3	33/53	
08	860	0	37	63	-	21	0	14	32/50	
13	800	3	75	23	-	3	0	40	34/57	

NEPHI PASTURE -LIVESTOCK EXCLOSURE - TREND STUDY NO. 27R-5



**Location Information**

USGS 7.5 min Map Info      Nephi Point; Township 42S, Range 4W, Section 1  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 394255 East 4116822 North

**Transect Information**

Browse Tag # (0' Stake)      Not Available  
 Transect Bearing              147° magnetic  
 Length                          300ft  
 Belt Placement                Line 1 (11ft & 95ft), Line 2 (59ft), Line 3 (34ft & 71ft)  
 Belt Marker Placement      No Rebar

**Directions to Site**

From Kanab, take US 89 east for 9.4 miles to Johnson Canyon. Travel north on Johnson Canyon road for 9.75 miles to the Lock Ridge-Nephi Pasture road. Turn right and go 16.25 miles (see 27-6 for more detail) on the main road to a major intersection in Nephi Pasture. Continue straight towards Nephi Point, going 0.9 miles to an exclosure. Walk east along the fence on the north side of the exclosure to the beginning of the livestock enclosure (lower fence). From here, walk down to the midpoint of the fenceposts. The baseline starts on the inside of the livestock enclosure at the midpoint, and runs at an azimuth of 147 degrees magnetic.

**Site Information**

Land Ownership BLM  
 Allotment Vermilion  
 Elevation 6,380ft (1,945m)  
 Aspect Northwest  
 Slope 5-10%  
 Sample Dates 08/12/1998, 07/30/2003, 07/29/2008, 07/23/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

VEGETATION HISTORY--

Management unit 27R, Study no: 5

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Mixed Mountain Brush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This transect was established inside the livestock enclosure in 1998 as part of a three-way comparison between the different enclosure grazing treatments. This transect is within 300 feet of the original Nephi Pasture study that samples outside the enclosure complex (27-7). The livestock enclosure is approximately 200 feet by 300 ft in size (about 1.4 acres). Deer presence in this enclosure has been heavy over the sample years (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Sand (Mountain Big Sagebrush)  
 NRCS Ecological Site # R035XY307UT

SOIL ANALYSIS DATA--

Management unit 27R, Study no: 5

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sand	90.2	2.0	7.8	5.8	0.2	0.8	6.9	12.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1998, the site remained a mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), Utah serviceberry (*Amelanchier utahensis*), and antelope bitterbrush (*Purshia tridentata*) with a limited herbaceous understory (Table - Browse Trends, Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have slowly increased on the site over the sample years (Table - Point-Quarter Tree Data). Juniper will likely continue to increase, and without disturbance it is expected to become the dominant species on the study site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 27R, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	8.5	12.4	13.7	-5.0	7.6	0.0	<b>67.2</b>	Good
2003	30.0	5.8	5.6	1.4	0.0	1.4	0.0	<b>44.2</b>	Poor
2008	28.1	0.5	4.4	0.0	0.0	3.2	0.0	<b>36.2</b>	Very Poor-Poor
2013	30.0	10.7	9.8	0.6	0.0	3.4	0.0	<b>54.4</b>	Fair

## HERBACEOUS TRENDS--

Management unit 27R, Study no: 5

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron smithii	b <sup>99</sup>	a <sup>9</sup>	a <sup>-</sup>	a <sup>-</sup>	2.82	.04	-	-
G	Agropyron spicatum	b <sup>20</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.60	-	-	-
G	Bromus tectorum (a)	b <sup>177</sup>	a <sup>-</sup>	a <sup>10</sup>	a <sup>2</sup>	4.69	-	.02	.00
G	Oryzopsis hymenoides	b <sup>28</sup>	a <sup>2</sup>	a <sup>-</sup>	a <sup>-</sup>	.59	.15	-	-
G	Poa fendleriana	b <sup>41</sup>	a <sup>8</sup>	a <sup>-</sup>	a <sup>-</sup>	2.07	.48	-	-
G	Poa secunda	a <sup>-</sup>	a <sup>-</sup>	a <sup>1</sup>	b <sup>11</sup>	-	-	.00	.27
G	Sitanion hystrix	b <sup>23</sup>	a <sup>1</sup>	a <sup>-</sup>	a <sup>-</sup>	.69	.00	-	-
G	Sporobolus cryptandrus	1	-	-	1	.00	.00	-	.00
G	Stipa comata	b <sup>14</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.07	.03	-	-
G	Vulpia octoflora (a)	c <sup>124</sup>	a <sup>-</sup>	b <sup>12</sup>	ab <sup>1</sup>	1.99	-	.02	.00
Total for Annual Grasses		301	0	22	3	6.68	0	0.04	0.01
Total for Perennial Grasses		226	20	1	12	6.87	0.71	0.00	0.28
Total for Grasses		527	20	23	15	13.55	0.71	0.04	0.29
F	Arabis sp.	5	-	-	-	.01	-	-	-
F	Astragalus sp.	7	-	-	-	.01	-	-	-
F	Calochortus nuttallii	-	5	-	-	-	.01	-	-
F	Chenopodium leptophyllum(a)	-	-	-	3	-	-	-	.01
F	Comandra pallida	c <sup>143</sup>	a <sup>47</sup>	b <sup>78</sup>	b <sup>95</sup>	3.15	.68	1.53	1.48
F	Descurainia pinnata (a)	b <sup>11</sup>	a <sup>-</sup>	b <sup>15</sup>	b <sup>14</sup>	.10	-	.07	.06
F	Draba sp. (a)	7	-	-	-	.01	-	-	-
F	Erigeron sp.	3	-	-	-	.00	-	-	-
F	Eriogonum cernuum (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>14</sup>	a <sup>-</sup>	-	-	.03	-
F	Eriogonum racemosum	5	-	-	-	.01	-	-	-
F	Euphorbia sp.	-	-	-	3	-	-	-	.00
F	Gilia sp. (a)	a <sup>-</sup>	b <sup>17</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.67	-	-
F	Lappula occidentalis (a)	5	-	5	1	.04	-	.01	.00
F	Lupinus argenteus	8	-	-	-	.57	-	-	-
F	Microsteris gracilis (a)	11	-	-	-	.02	-	-	-
F	Penstemon sp.	b <sup>14</sup>	a <sup>-</sup>	ab <sup>4</sup>	ab <sup>8</sup>	.05	-	.06	.18
F	Plantago patagonica (a)	c <sup>45</sup>	a <sup>-</sup>	b <sup>12</sup>	ab <sup>8</sup>	.64	-	.02	.01

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Polygonum douglasii</i> (a)	1	-	2	-	.00	-	.01	-
F	<i>Sphaeralcea parvifolia</i>	a <sup>-</sup>	a <sup>-</sup>	ab <sup>3</sup>	b <sup>10</sup>	-	-	.00	.02
Total for Annual Forbs		80	17	48	26	0.82	0.67	0.14	0.09
Total for Perennial Forbs		185	52	85	116	3.81	0.69	1.59	1.69
Total for Forbs		265	69	133	142	4.64	1.37	1.74	1.78

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

**BROWSE TRENDS--**

Management unit 27R, Study no: 5

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Amelanchier utahensis</i>	6.47	8.65	6.52	8.01	10.30	10.90	9.56
B	<i>Artemisia tridentata tridentata</i>	10.81	7.75	9.95	10.60	7.88	14.16	15.70
B	<i>Gutierrezia sarothrae</i>	2.20	.06	.00	.00	.11	-	-
B	<i>Juniperus osteosperma</i>	1.72	1.21	1.20	1.34	2.86	4.85	4.61
B	<i>Opuntia</i> sp.	.03	-	-	-	-	-	-
B	<i>Pinus edulis</i>	.15	.15	-	.38	-	-	-
B	<i>Purshia tridentata</i>	5.34	5.20	3.89	4.17	4.76	6.75	3.83
Total for Browse		26.73	23.03	21.58	24.52	25.91	36.66	33.7

**POINT-QUARTER TREE DATA--**

Management unit 27R, Study no: 5

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
<i>Juniperus osteosperma</i>	20	<18	<18	<18	6.8	-	-	-
<i>Pinus edulis</i>	27	<18	<18	<18	7.5	-	-	-

**BASIC COVER--**

Management unit 27R, Study no: 5

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	47.41	25.80	24.88	27.07
Rock	0	.00	0	0
Pavement	0	0	.03	.01
Litter	66.72	58.25	60.66	53.76
Cryptogams	1.73	1.35	.24	.25
Bare Ground	23.45	32.59	27.82	33.89



PELLET GROUP DATA--

Management unit 27R, Study no: 5

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	28	23	73	26
Elk	1	-	-	-
Deer	39	34	34	26

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
111 (274)	169 (418)	76 (187)	57 (141)

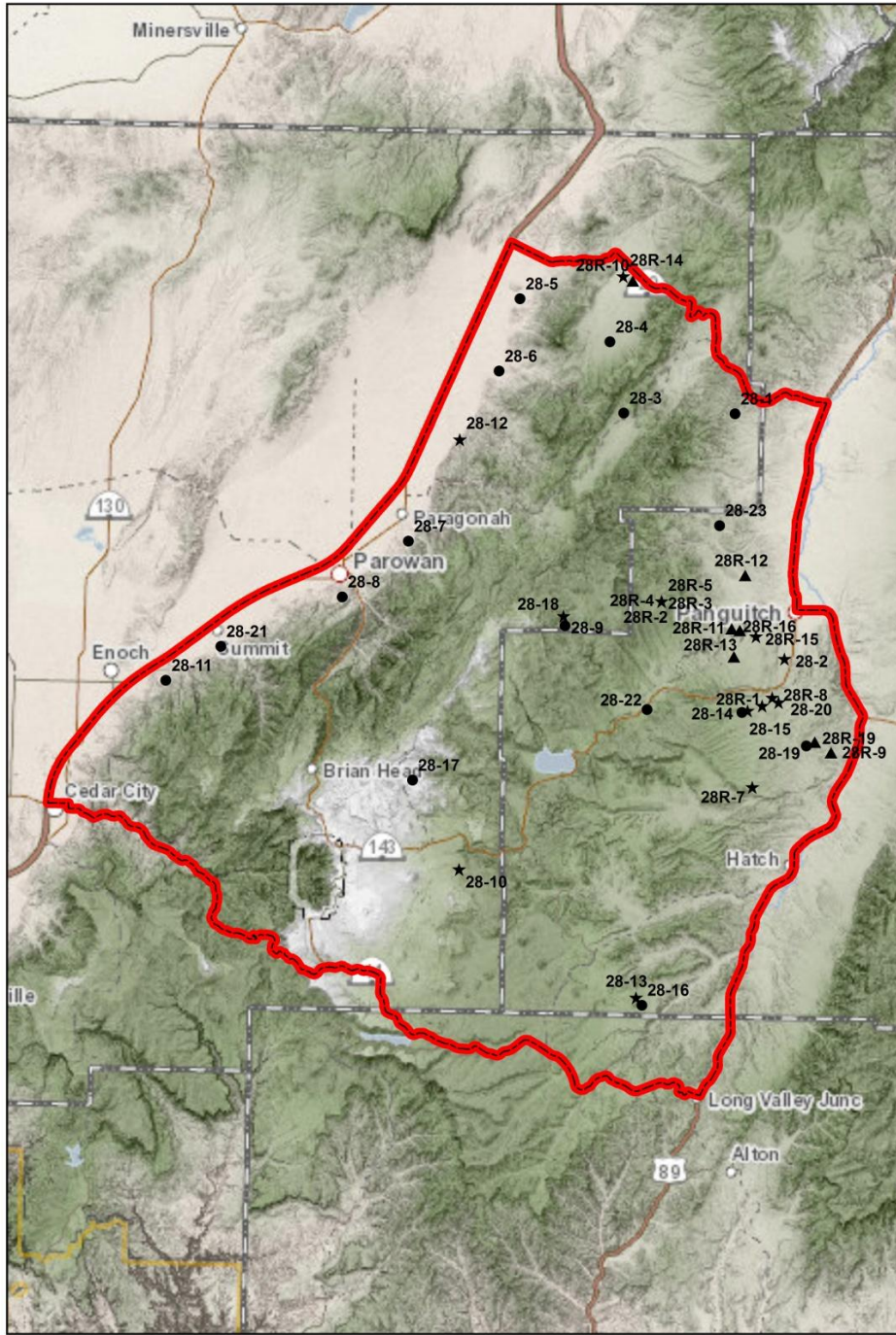
BROWSE CHARACTERISTICS--


Management unit 27R, Study no: 5

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
98	<b>740</b>	27	62	11	100	30	3	8	49/56
03	<b>540</b>	22	70	7	40	7	22	4	61/64
08	<b>1000</b>	26	52	22	-	20	12	4	61/56
13	<b>940</b>	28	72	0	20	19	0	4	56/64
<b>Artemisia tridentata tridentata</b>									
98	<b>3340</b>	22	44	34	180	27	13	18	29/30
03	<b>2420</b>	2	31	66	-	12	4	51	32/34
08	<b>1820</b>	1	34	65	80	15	5	24	43/43
13	<b>1940</b>	11	63	26	80	30	4	23	38/46
<b>Gutierrezia sarothrae</b>									
98	<b>1780</b>	2	98	0	40	0	0	0	11/12
03	<b>120</b>	0	83	17	-	0	0	17	11/11
08	<b>20</b>	100	0	0	-	0	0	0	7/5
13	<b>80</b>	50	50	0	-	0	0	0	11/14
<b>Juniperus osteosperma</b>									
98	<b>60</b>	100	0	0	-	0	0	0	-/-
03	<b>60</b>	67	0	33	-	0	0	0	-/-
08	<b>60</b>	0	100	0	-	0	0	0	-/-
13	<b>80</b>	25	75	0	-	25	0	25	-/-
<b>Opuntia sp.</b>									
98	<b>20</b>	0	100	-	-	0	0	0	6/4
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>20</b>	0	100	-	-	0	0	0	7/21
<b>Purshia tridentata</b>									
98	<b>800</b>	28	63	10	20	38	0	8	33/48
03	<b>840</b>	7	76	17	-	29	69	5	30/46
08	<b>980</b>	0	51	49	-	31	14	31	26/35
13	<b>1040</b>	25	62	13	-	56	4	23	31/47

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Ribes sp.										
98	<b>40</b>	0	100	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	65/45	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

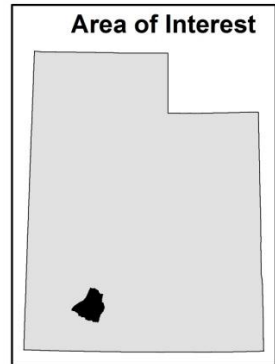
# WILDLIFE MANAGEMENT UNIT 28 - PANGUITCH LAKE



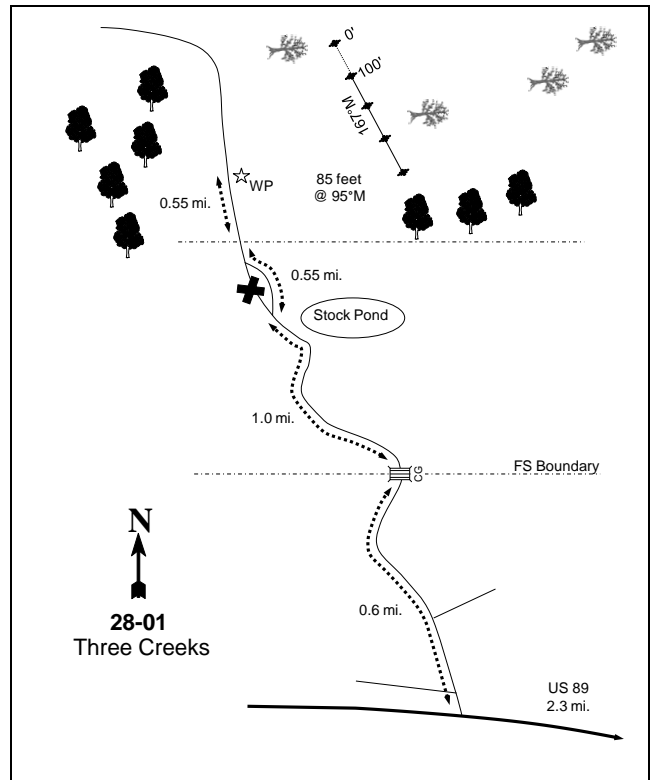
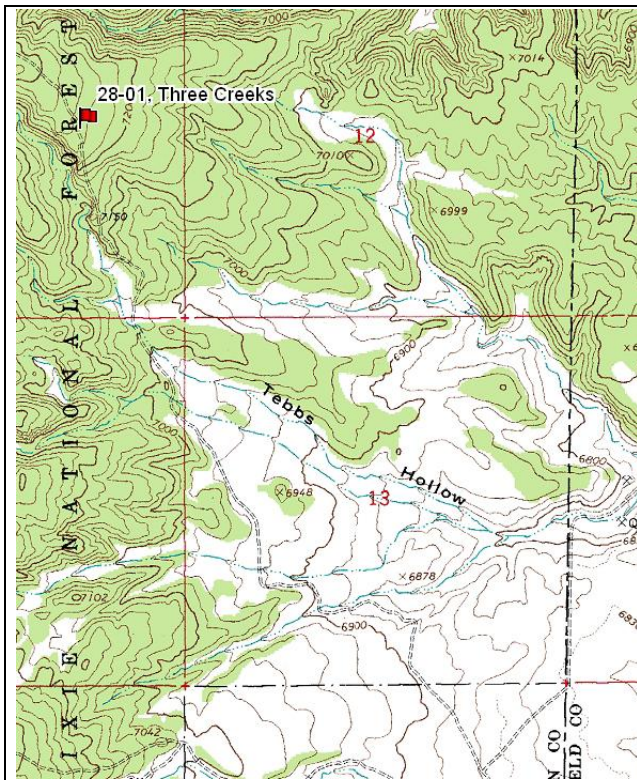
 Unit - 28

**Study Location  
Project, Status**

- RT, Active
- ★ RT, Suspended
- RT/WRI, Active
- ▲ WRI, Active
- ★ WRI, Suspended



## THREE CREEKS - TREND STUDY NO. 28-1



### Location Information

USGS 7.5 min Map Info      Panguitch NW; Township 33S, Range 6W, Section 11  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 368985 East 4202060 North

### Transect Information

Browse Tag # (0' Stake)      7164  
 Transect Bearing              167° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement      Belt 4: 2ft; Belt 2: 1ft

### Directions to Site

From the SR 20-US 89 junction, proceed south on US 89 for 3.1 miles to the Three Creeks road. Travel west on this road (do not take north fork by gate) for 0.5 miles to a fork. Bear right and go 1.85 miles to Three Forks taking the right most one. Travel 0.6 miles to a cattleguard. Continue 1.0 mile to a stock-pond. Proceed up the washed out road for 0.55 miles to a fence taking a right fork at 0.3 miles. Continue 0.55 miles up to the chaining and to the witness post which is a short yellow fencepost. From the witness post by the road, walk 185 feet east to the 400-foot stake. The 0-foot baseline stake is 400 feet north, and the short green fencepost is marked by browse tag #7164.

**Site Information**

Land Ownership USFS  
 Allotment Three Creeks  
 Elevation 7,250ft (2,210m)  
 Aspect East  
 Slope 8%  
 Sample Dates 08/20/1987, 08/03/1992, 07/07/1998, 06/26/2003, 06/24/2008, 06/05/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 1

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining	-	-	1967	-
Seeding	-	-	1967	-
Lop and Scatter	-	-	1987-1992	-
Prescribed Fire	-	-	2003?	-
Lop and Scatter	-	-	2003-2008	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Habitat Not Winter, Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 28, Study no: 1

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1987	Perennial Grass/Mountain Big Sagebrush	Phase I
1992-1998	Mountain Big Sagebrush	Phase I
2003-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This study is on the northeast edge of the Markagunt Plateau and drains easterly into the Sevier River. Several intermittent streams are nearby with a stock pond one mile to the south. In 2003, there was a prescribed fire on the site before it was read that year, though not all of the sagebrush was burned (Table - Disturbance History).

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Stony Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R047XB336UT

**SOIL ANALYSIS DATA--**

Management unit 22, Study no: 1

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Sandy Loam	54.2	38.0	7.8	7.1	0.5	2.2	7.3	28.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1987, the site was likely a mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and crested wheatgrass (*Agropyron cristatum*) community, which was seeded as part of the chaining treatment back in 1967 (Appendix B -Pre-1992 Data, Table - Disturbance History). Young pinyon pine (*Pinus edulis*) was also found encroaching on the site. Forb diversity has been high but remains low in cover throughout all sample years (Table - Herbaceous Trends). A prescribed fire in 2003 reduced the cover of shrubs and perennial herbaceous understory. Pinyon and juniper trees were removed by the prescribed burn and lop and scatter treatment that both occurred between 2003 and 2008. Since then the shrub and grass cover have steadily increased, and has transitioned to a mountain big sagebrush site with a strong component of crested wheatgrass (Table - Browse Trends, Table - Herbaceous Trends).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 28, study no: 1

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	8.8	10.4	15.0	30.0	0.0	5.9	0.0	<b>70.1</b>	Good
1998	10.6	14.8	14.8	30.0	0.0	6.0	0.0	<b>76.1</b>	Good
2003	3.4	0.0	0.0	10.0	0.0	6.2	0.0	<b>19.7</b>	Very Poor
2008	5.7	0.0	0.0	28.9	0.0	5.1	0.0	<b>39.7</b>	Poor
2013	11.6	13.9	8.9	30.0	0.0	4.1	0.0	<b>68.5</b>	Good

HERBACEOUS TRENDS--  
Management unit 28, Study no: 1

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	<i>Agropyron cristatum</i>	b243	c327	a118	b263	bc286	12.82	17.80	3.31	8.81	13.35
G	<i>Agropyron intermedium</i>	a164	b66	a7	a9	ab33	4.77	1.26	.02	.18	.48
G	<i>Agropyron smithii</i>	a41	a39	a60	b96	a28	1.28	.66	.84	1.91	.19
G	<i>Agropyron spicatum</i>	5	9	-	-	5	.63	.05	-	-	.03
G	<i>Bouteloua gracilis</i>	b59	b58	a29	ab40	ab48	2.32	.62	.51	1.95	1.74
G	<i>Bromus tectorum</i> (a)	a-	a2	a-	b14	a-	-	.00	-	.06	-
G	<i>Carex</i> sp.	b12	bc24	a-	c42	c33	.27	.31	-	.55	1.15
G	<i>Elymus junceus</i>	4	-	-	3	5	.06	-	-	.00	.03
G	<i>Oryzopsis hymenoides</i>	b28	ab14	a4	ab16	a7	.63	.06	.01	.20	.18
G	<i>Poa fendleriana</i>	a5	b13	a1	a1	a1	.03	.06	.00	.15	.15
G	<i>Poa secunda</i>	-	5	3	-	1	-	.01	.00	-	.00
G	<i>Sitanion hystrix</i>	ab6	b15	a-	a-	a2	.33	.10	-	-	.00
G	<i>Stipa comata</i>	a7	a6	ab14	b30	b28	.24	.22	.28	.71	.81
Total for Annual Grasses		0	2	0	14	0	0	0.00	0	0.06	0
Total for Perennial Grasses		574	576	236	500	477	23.39	21.17	5.00	14.47	18.14
Total for Grasses		574	578	236	514	477	23.39	21.17	5.00	14.53	18.14
F	<i>Alyssum alyssoides</i> (a)	-	3	-	-	-	-	.00	-	-	-
F	<i>Amaranthus</i> sp.	-	-	3	-	-	-	-	.03	-	-
F	<i>Arabis</i> sp.	-	-	-	-	3	-	-	-	-	.00
F	<i>Astragalus convallarius</i>	-	2	5	-	-	-	.03	.06	-	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
F	Astragalus sp.	1	-	-	-	1	.00	-	-	-	.00
F	Calochortus nuttallii	-	-	1	-	-	-	-	.00	-	-
F	Castilleja chromosa	4	3	3	3	1	.03	.03	.03	.15	.00
F	Chaenactis douglasii	-	-	-	-	-	-	-	-	-	.00
F	Cryptantha fulvocanescens	b14	ab5	a-	ab9	ab9	.07	.04	.00	.04	.02
F	Cymopterus sp.	-	-	-	-	-	-	-	.00	-	-
F	Descurainia sp. (a)	b17	a-	a-	a3	a-	.23	-	-	.00	-
F	Draba sp. (a)	-	1	-	-	-	-	.00	-	-	-
F	Gayophytum ramosissimum(a)	-	-	-	3	-	-	-	-	.01	-
F	Ipomopsis aggregata	3	-	-	1	-	.00	-	-	.00	-
F	Lappula occidentalis (a)	a-	ab3	ab1	c25	b12	-	.00	.00	.12	.06
F	Lomatium sp.	-	-	2	2	-	-	-	.03	.00	-
F	Lupinus argenteus	b53	b56	a19	ab36	ab35	2.59	2.61	2.07	1.45	1.43
F	Lygodesmia spinosa	2	2	5	6	7	.00	.03	.30	.21	.09
F	Machaeranthera canescens	-	4	-	-	-	-	.01	-	-	-
F	Microsteris gracilis (a)	-	-	-	2	-	-	-	-	.00	-
F	Oenothera sp.	-	-	-	2	3	-	-	-	.00	.03
F	Penstemon sp.	5	5	-	5	2	.06	.00	-	.01	.00
F	Phlox longifolia	a11	b40	ab25	a14	ab24	.08	.17	.08	.04	.07
F	Polygonum douglasii (a)	-	3	-	8	-	-	.01	-	.01	-
F	Senecio integerrimus	-	-	1	-	-	-	-	.00	-	-
F	Senecio multilobatus	a4	a3	b31	c58	bc35	.01	.03	.39	.46	.31
F	Sphaeralcea coccinea	a6	a5	a6	b21	a7	.09	.01	.09	.14	.05
F	Streptanthus cordatus	-	-	1	1	5	-	-	.00	.00	.02
F	Tragopogon dubius (a)	-	-	-	7	-	-	.00	-	.09	-
F	Trifolium sp.	-	1	-	2	1	-	.00	-	.01	.00
F	Unknown forb-annual (a)	2	-	-	-	-	.03	-	-	-	-
F	Unknown forb-perennial	3	6	-	-	-	.00	.01	-	-	-
F	Zigadenus paniculatus	-	-	1	-	-	-	-	.00	.01	-
Total for Annual Forbs		19	10	1	48	12	0.26	0.03	0.00	0.24	0.06
Total for Perennial Forbs		106	132	103	160	133	2.96	2.99	3.12	2.55	2.07
Total for Forbs		125	142	104	208	145	3.22	3.03	3.12	2.79	2.13

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

#### BROWSE TRENDS--

Management unit 28, Study no: 1

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	-	.00	-	-	-	-	-	-
B	Artemisia tridentata tridentata	2.78	1.29	-	.41	.38	-	1.20	.38
B	Artemisia tridentata vaseyana	4.02	6.34	2.74	3.77	8.69	5.01	6.86	11.45
B	Chrysothamnus viscidiflorus viscidiflorus	-	.00	-	.38	-	-	-	.53

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	Gutierrezia sarothrae	.51	.42	1.18	.96	.44	.88	1.20	.66
B	Juniperus osteosperma	1.14	.84	-	-	-	-	-	-
B	Opuntia sp.	.33	.06	.06	-	-	-	-	-
B	Pinus edulis	.15	.18	1.00	-	-	.13	-	-
B	Purshia tridentata	.18	.68	.01	.30	.18	-	.05	.16
Total for Browse		9.12	9.83	4.99	5.83	9.70	6.02	9.31	13.34

POINT-QUARTER TREE DATA--

Management unit 28, Study no: 1

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	41	25	21	21	2.7	3.2	1.4	5.3
Pinus edulis	59	34	23	21	1.6	1.9	1.3	3.9

BASIC COVER--

Management unit 28, Study no: 1

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	31.85	35.07	13.53	24.72	31.61
Rock	12.85	3.89	3.44	3.15	2.67
Pavement	0	5.90	2.87	5.46	4.36
Litter	36.66	46.38	27.10	27.34	32.47
Cryptogams	.03	.25	.00	.03	0
Bare Ground	35.43	30.17	61.03	47.73	38.73

PELLET GROUP DATA--

Management unit 28, Study no: 1

Type	Quadrat Frequency					Days use per acre (ha)			
	'92	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	61	29	31	87	8	-	-	-	-
Elk	-	7	15	6	5	9 (22)	9 (22)	7 (18)	6 (15)
Deer	18	18	15	5	6	11 (27)	15 (38)	16 (40)	2 (5)
Cattle	5	16	22	12	3	45 (111)	29 (72)	10 (25)	5 (13)



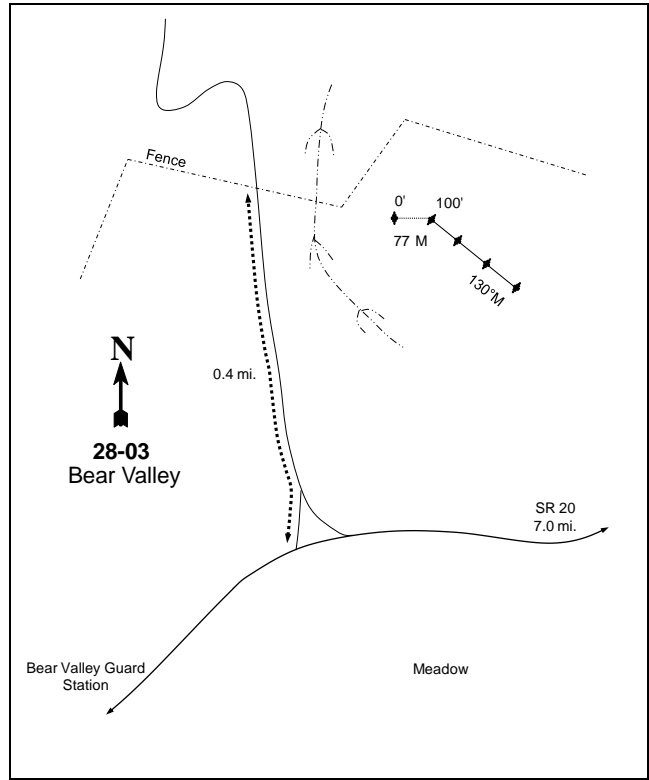
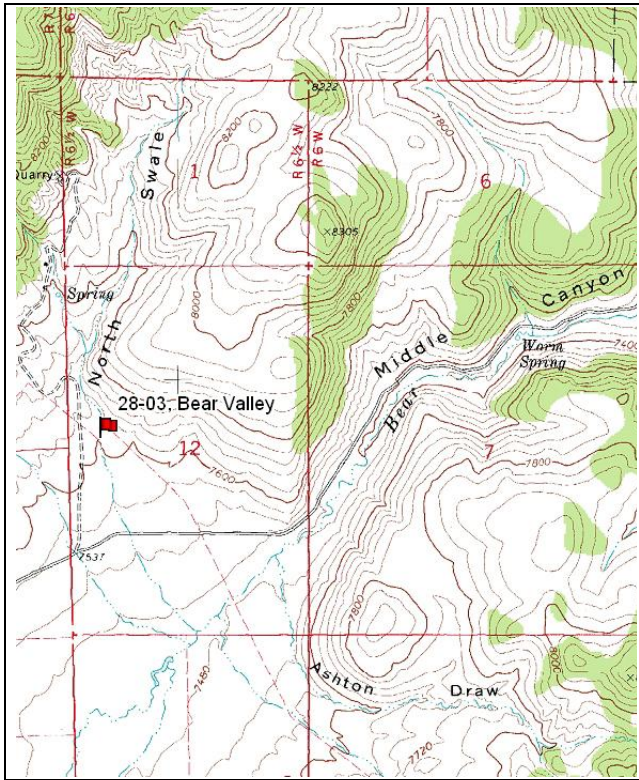
BROWSE CHARACTERISTICS--

Management unit 28, Study no: 1

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia nova</i>										
92	40	0	100	-	-	0	100	0	-/-	
98	20	0	100	-	-	0	0	0	18/30	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Artemisia tridentata tridentata</i>										
92	100	60	20	20	-	20	0	0	-/-	
98	120	33	67	0	-	0	0	0	44/64	
03	0	0	0	0	-	0	0	0	-/-	
08	20	0	100	0	20	0	0	0	51/69	
13	40	0	100	0	-	0	0	0	42/86	
<i>Artemisia tridentata vaseyana</i>										
92	1760	35	52	13	20	67	8	2	-/-	
98	1340	30	69	1	20	10	0	0	22/30	
03	700	6	69	26	-	11	6	6	20/28	
08	1600	35	59	6	2180	8	0	1	22/33	
13	3020	19	77	4	120	48	.66	7	20/30	
<i>Chrysothamnus nauseosus</i>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	20	0	100	-	-	0	0	0	9/12	
13	20	0	100	-	-	0	0	0	21/20	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
92	20	0	100	-	-	0	0	0	-/-	
98	20	0	100	-	-	0	0	0	19/42	
03	20	0	100	-	-	0	0	0	19/27	
08	0	0	0	-	-	0	0	0	13/21	
13	20	0	100	-	-	0	0	0	9/9	
<i>Gutierrezia sarothrae</i>										
92	4300	47	53	0	320	0	0	0	-/-	
98	900	18	80	2	120	0	0	0	9/7	
03	1640	4	78	18	-	0	0	5	9/9	
08	5460	14	79	8	1260	12	3	.73	8/8	
13	2200	57	38	5	480	0	0	14	7/7	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Juniperus osteosperma</b>									
92	120	67	33	-	-	0	0	0	-/-
98	80	75	25	-	-	0	0	0	-/-
03	20	100	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Leptodactylon pungens</b>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	6/10
03	0	0	0	-	-	0	0	0	7/9
08	0	0	0	-	-	0	0	0	5/6
13	0	0	0	-	-	0	0	0	5/9
<b>Opuntia sp.</b>									
92	400	20	60	20	-	0	0	20	-/-
98	140	0	86	14	-	0	0	0	5/8
03	220	0	100	0	-	0	0	0	6/11
08	120	0	100	0	-	0	0	0	5/11
13	80	0	100	0	-	0	0	0	4/10
<b>Pinus edulis</b>									
92	100	80	20	-	-	0	40	0	-/-
98	120	67	33	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Purshia tridentata</b>									
92	60	0	100	0	-	0	33	67	-/-
98	100	20	80	0	-	60	20	0	15/27
03	80	0	75	25	-	25	75	0	7/24
08	100	0	100	0	-	20	80	0	18/37
13	100	0	100	0	-	0	100	20	10/32

BEAR VALLEY - TREND STUDY NO. 28-3



**Location Information**

USGS 7.5 min Map Info Little Creek Peak; Township 33S, Range 6.5W, Section 12  
 GPS (0' Stake) NAD 83, UTM Zone 12, 360495 East 4202117 North

**Transect Information**

Browse Tag # (0' Stake) 7163  
 Transect Bearing 77° magnetic (Lines 2-4: 130° magnetic)  
 Length 400ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the US 89-SR 20 Junction, go approximately 7.0 miles west on SR 20 to a corral past mile marker 14. Turn left on the Little Creek Road that leads to Bear Valley. Travel 7.0 miles south on the main road to a minor fork. Turn right and go 0.4 miles to a fence and wire gate. Stop here and walk east along the fenceline to the corner. Walk 4 paces east from the fence corner to a short red fencepost tagged #7163 which is the 0-foot baseline stake. The 100-foot stake is rebar.

**Site Information**

Land Ownership USFS  
 Allotment Red Creek  
 Elevation 7,620ft (2,323m)  
 Aspect Southeast  
 Slope 5%  
 Sample Dates 08/20/1987, 08/03/1992, 07/07/1998, 06/26/2003, 06/24/2008, 06/05/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 3

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Substantial Summer, Calving; Sage-Grouse, Habitat Not Winter, Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 28, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2003	Perennial Grass	Phase I
2008-2013	Perennial Grass/Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This site is located in the bottom of a large valley at the north end of the Upper Bear Valley. Several cabins can be found a few miles from the transect and a stream and stock pond are found within a half mile.

**Site Potential**

1981-2010 Average Annual Precipitation 19 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	64.2	20.0	15.8	5.8	0.3	2.3	19.9	1542.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1987, the site was dominated by crested wheatgrass (*Agropyron cristatum*) which was seeded historically (Appendix B -Pre-1992 Data). Sticky leaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) was the dominant browse species. Forbs were diverse, but cover was low (Table - Herbaceous Trends). Shrub cover has increased over the sample years, especially mountain big sagebrush (*Artemisisa tridentata* ssp. *vaseyana*), though crested wheatgrass has remained a dominant component of the

understory (Table - Browse Trends, Herbaceous Trends). Cheatgrass (*Bromus tectorum*) is also present on the site (Table - Herbaceous Trends).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 28, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	0.2	0.0	0.0	30.0	0.0	8.1	0.0	<b>38.3</b>	Poor
1998	1.6	0.0	0.0	30.0	-0.4	7.9	0.0	<b>39.1</b>	Poor
2003	3.5	0.0	0.0	30.0	-0.6	2.3	0.0	<b>35.2</b>	Very Poor-Poor
2008	5.3	0.0	0.0	30.0	-0.4	5.1	0.0	<b>40.0</b>	Poor
2013	10.9	14.1	15.0	30.0	-0.9	8.0	0.0	<b>77.2</b>	Good

#### HERBACEOUS TRENDS--

Management unit 28, Study no: 3

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Agropyron cristatum	355	347	375	392	379	17.26	17.41	25.88	28.31	19.41
G	Agropyron smithii	c79	bc63	ab45	ab32	a20	.31	.45	.34	.71	.12
G	Bouteloua gracilis	b28	a8	a3	a4	a3	.43	.21	.15	.03	.15
G	Bromus inermis	-	-	-	5	5	-	-	-	.18	.38
G	Bromus tectorum (a)	a-	b20	c42	d78	d92	-	.52	.76	.58	1.14
G	Carex sp.	b11	a-	ab3	a-	b10	.02	-	.00	-	.08
G	Elymus cinereus	-	-	-	-	3	-	-	-	-	.03
G	Elymus junceus	1	2	4	-	7	.00	.00	.15	-	.30
G	Poa pratensis	ab2	b12	a-	b17	ab5	.03	.37	-	.16	.41
G	Stipa comata	b48	a15	a9	a15	ab31	1.10	.37	.26	.44	.73
Total for Annual Grasses		0	20	42	78	92	0	0.52	0.76	0.58	1.14
Total for Perennial Grasses		524	447	439	465	463	19.17	18.82	26.78	29.84	21.62
Total for Grasses		524	467	481	543	555	19.17	19.34	27.55	30.42	22.76
F	Agoseris glauca	a-	a2	a2	b43	b27	-	.00	.03	.23	.42
F	Androsace septentrionalis (a)	b16	d172	a-	b13	c92	.03	2.82	-	.14	.60
F	Artemisia ludoviciana	4	12	3	7	14	.00	.56	.00	.06	.53
F	Astragalus panguicensis	9	2	-	5	2	.02	.01	-	.01	.00
F	Castilleja linariaefolia	-	-	11	-	1	-	-	.18	-	.00
F	Cirsium sp.	9	4	5	9	7	.04	.15	.04	.36	.27
F	Collinsia parviflora (a)	a-	c121	a-	c92	b24	-	.91	-	.21	.06
F	Crepis acuminata	-	4	-	-	-	-	.01	-	-	-
F	Delphinium nuttallianum	-	-	-	2	-	-	-	-	.00	-
F	Descurainia pinnata (a)	-	2	1	-	3	-	.00	.00	-	.03
F	Dracocephalum parviflorum	-	3	-	-	11	-	.01	-	-	.04
F	Epilobium brachycarpum (a)	-	1	-	-	-	-	.00	-	-	-
F	Erigeron pumilus	-	-	2	-	-	-	-	.00	-	-
F	Eriogonum cernuum (a)	5	-	-	1	-	.01	-	-	.00	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
F	Euphorbia sp.	-	3	-	-	-	-	.03	-	-	-
F	Gayophytum ramosissimum(a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>115</sup>	a <sup>-</sup>	-	-	-	.81	-
F	Ipomopsis aggregata	-	1	-	-	4	-	.00	-	-	.03
F	Lactuca serriola (a)	-	-	-	1	2	-	-	-	.00	.00
F	Lappula occidentalis (a)	a <sup>13</sup>	c <sup>130</sup>	a <sup>12</sup>	a <sup>36</sup>	b <sup>73</sup>	.03	1.90	.04	.17	.48
F	Lepidium sp. (a)	2	-	-	-	1	.00	-	-	-	.03
F	Lupinus argenteus	b <sup>77</sup>	c <sup>113</sup>	a <sup>7</sup>	a <sup>10</sup>	a <sup>36</sup>	2.97	1.35	.30	.04	.96
F	Lygodesmia spinosa	19	15	13	11	11	.27	.39	.39	.60	.09
F	Microsteris gracilis (a)	a <sup>3</sup>	c <sup>248</sup>	a <sup>3</sup>	b <sup>132</sup>	a <sup>11</sup>	.00	2.27	.00	.45	.02
F	Oenothera pallida	ab <sup>11</sup>	c <sup>44</sup>	a <sup>-</sup>	ab <sup>4</sup>	bc <sup>23</sup>	.05	.38	-	.01	.14
F	Penstemon sp.	-	1	-	-	-	-	.00	-	-	-
F	Phlox longifolia	b <sup>63</sup>	c <sup>149</sup>	a <sup>8</sup>	b <sup>69</sup>	c <sup>139</sup>	.15	.86	.16	.48	.63
F	Polygonum douglasii (a)	b <sup>34</sup>	c <sup>104</sup>	a <sup>-</sup>	b <sup>13</sup>	b <sup>12</sup>	.07	1.01	-	.03	.04
F	Senecio douglasii	c <sup>28</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>21</sup>	ab <sup>10</sup>	.54	-	-	.70	.83
F	Senecio multilobatus	-	1	-	2	-	-	.00	-	.03	-
F	Sphaeralcea coccinea	-	10	-	2	4	-	.07	-	.00	.03
F	Taraxacum officinale	a <sup>5</sup>	b <sup>12</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.01	.06	-	.00	-
F	Tragopogon dubius (a)	a <sup>1</sup>	c <sup>57</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>13</sup>	.00	.62	-	-	.13
F	Unknown forb-annual (a)	a <sup>-</sup>	b <sup>39</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	-	.12	-	-	-
Total for Annual Forbs		74	874	16	403	231	0.15	9.67	0.04	1.84	1.41
Total for Perennial Forbs		225	376	51	185	289	4.06	3.94	1.13	2.56	4.02
Total for Forbs		299	1250	67	588	520	4.21	13.62	1.17	4.41	5.43

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

BROWSE TRENDS--

Management unit 28, Study no: 3

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	.13	1.25	2.79	4.26	8.75	1.31	4.91	8.51
B	Chrysothamnus nauseosus	.15	1.25	-	-	-	-	-	.20
B	Chrysothamnus viscidiflorus viscidiflorus	4.56	10.96	2.63	2.57	3.58	2.08	2.98	5.93
B	Gutierrezia sarothrae	-	-	.00	.03	-	-	-	-
B	Tetradymia canescens	.44	.21	.30	.33	.45	.05	.16	.35
Total for Browse		5.28	13.69	5.73	7.20	12.78	3.44	8.05	14.99

**BASIC COVER--**

Management unit 28, Study no: 3

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	28.50	45.32	34.58	42.26	41.67
Rock	6.33	.26	.27	.03	2.02
Pavement	0	11.18	5.51	7.40	6.67
Litter	25.90	48.67	24.17	34.71	41.32
Cryptogams	0	.00	0	.03	.03
Bare Ground	37.16	28.85	42.65	27.33	26.39

**PELLET GROUP DATA--**

Management unit 28, Study no: 3

Type	Quadrat Frequency					Days use per acre (ha)			
	'92	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	88	19	82	96	22	-	-	-	-
Elk	-	2	-	1	11	3 (7)	-	3 (8)	11 (26)
Deer	10	23	9	2	6	19 (47)	11 (28)	5 (12)	2 (5)
Cattle	3	29	8	25	20	65 (161)	23 (56)	11 (27)	47 (118)

**BROWSE CHARACTERISTICS--**

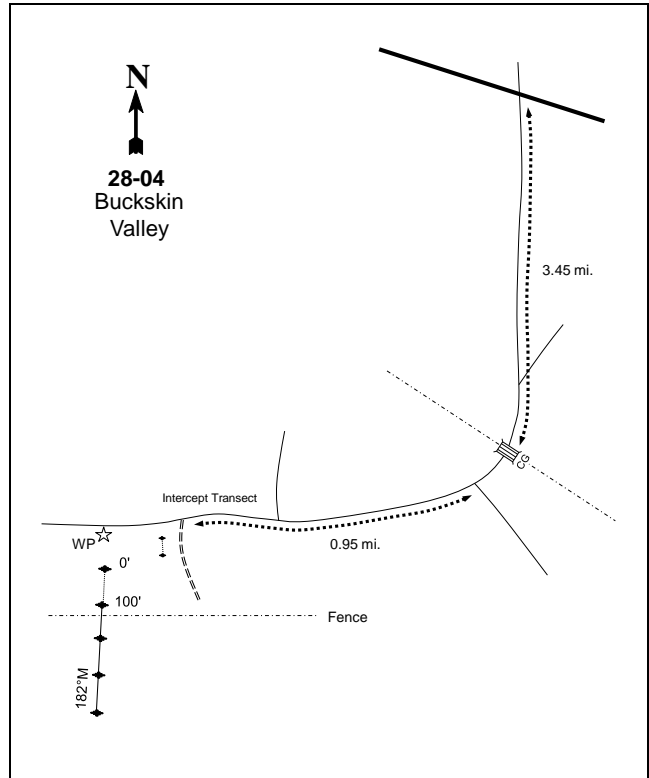
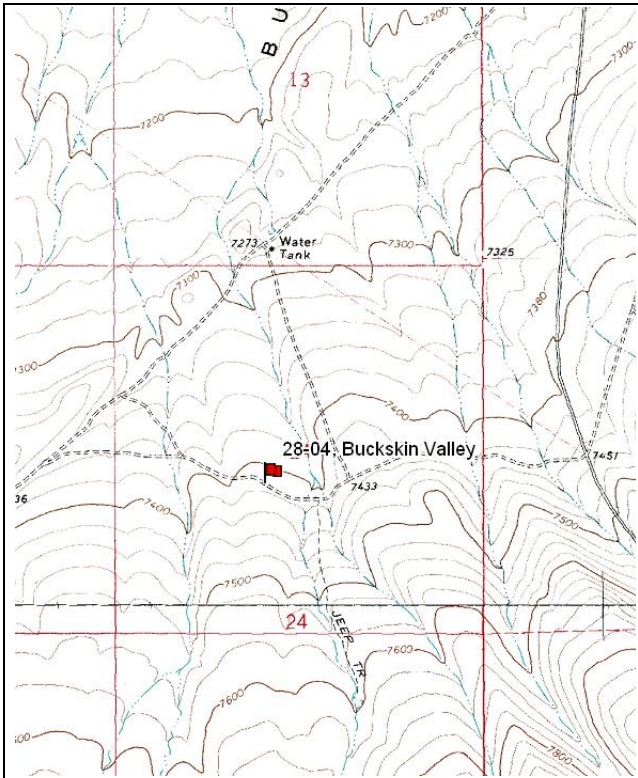
Management unit 28, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia tridentata vaseyana</b>									
92	<b>120</b>	17	83	0	40	50	0	0	-/-
98	<b>1540</b>	78	22	0	160	9	0	21	21/28
03	<b>940</b>	2	57	40	20	26	17	2	22/27
08	<b>700</b>	23	66	11	60	3	6	9	25/34
13	<b>4280</b>	57	40	3	560	10	29	6	17/27
<b>Chrysothamnus nauseosus</b>									
92	<b>20</b>	0	100	-	-	100	0	100	-/-
98	<b>560</b>	18	82	-	-	0	0	0	11/17
03	<b>0</b>	0	0	-	-	0	0	0	24/34
08	<b>0</b>	0	0	-	-	0	0	0	38/56
13	<b>80</b>	0	100	-	-	0	0	0	34/51
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
92	<b>17080</b>	53	44	3	480	12	1	.93	-/-
98	<b>11320</b>	38	61	2	160	3	0	2	14/16
03	<b>6580</b>	14	73	13	20	2	11	4	9/8
08	<b>5880</b>	17	67	17	80	12	10	4	9/11
13	<b>4860</b>	10	90	0	-	.41	0	0	11/15

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Gutierrezia sarothrae</i>										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>100</b>	0	100	-	-	0	0	0	3/4	
08	<b>100</b>	20	80	-	-	0	0	0	3/3	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Symphoricarpos oreophilus</i>										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	16/14	
03	<b>0</b>	0	0	-	-	0	0	0	37/82	
08	<b>0</b>	0	0	-	-	0	0	0	32/61	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Tetradymia canescens</i>										
92	<b>240</b>	33	58	8	-	8	0	0	-/-	
98	<b>180</b>	11	89	0	-	11	0	0	14/21	
03	<b>200</b>	0	70	30	-	10	10	0	11/13	
08	<b>320</b>	19	63	19	-	6	0	0	9/12	
13	<b>200</b>	0	100	0	-	20	0	0	12/18	



BUCKSKIN VALLEY - TREND STUDY NO. 28-4



**Location Information**

USGS 7.5 min Map Info      Burnt Peak; Township 32S, Range 7W, Section 24  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 359445 East 4207552 North

**Transect Information**

Browse Tag # (0' Stake)      9005  
 Transect Bearing              182° magnetic  
 Length                          400ft  
 Belt Placement                Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement      Belt 4: 10ft

**Directions to Site**

From SR 20 just west of mile marker 7, turn south onto the Buckskin Valley road. Travel 3.45 miles to a cattleguard. Just beyond the fence and cattleguard, bear right and proceed west 0.95 miles to an intersection where a very faint road goes to the south. About 60 feet west of this intersection is the witness post on the south (left) side of the road. The 0-foot stake is 6 feet southeast of the witness post. The 0-foot stake is a 2 foot tall green fencepost marked by a red browse tag #9005. The frequency baseline runs south-southwest from here. The old line-intercept transect 57A-7-78 is marked by a red-painted steel fencepost 10 feet east of this study.

**Site Information**

Land Ownership BLM  
 Allotment Buckskin Mountain  
 Elevation 7,410ft (2,259m)  
 Aspect Northeast  
 Slope 4-5%  
 Sample Dates 08/22/1987, 08/02/1992, 07/07/1998, 06/26/2003, 06/04/2008, 06/04/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Summer, Calving; Sage-Grouse Habitat Not Winter, Nest and Brood-Rearing

VEGETATION HISTORY--

Management unit 28, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This area is important big game transitional range and winter rang in mild winters. The lower areas have been treated by the BLM to enhance livestock grazing. Deer presence has been high on the site for all sample years (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Fine, montmorillonitic, frigid Calcic Pachic Argixerolls  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

SOIL ANALYSIS DATA--

Management unit 28, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	44.2	30.0	25.8	5.9	0.4	3.8	22.7	236.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1987, this site has been in a stable state of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a prominent component of antelope bitterbrush (*Purshia tridentata*) (Appendix B -Pre-1992 Data). The invasive annual species cheatgrass (*Bromus tectorum*) has steadily increased in cover since 2003. In 2013, cheatgrass became the largest component of the herbaceous understory (Table - Herbaceous Trends). The resilience of this sagebrush community may be at risk due to the high presences of cheatgrass on this site (USDA-NRCS, 2011).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 28, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	30.0	1.4	4.7	16.9	-0.1	10.0	0.0	<b>62.9</b>	Fair
1998	30.0	9.0	3.4	12.9	-2.2	10.0	0.0	<b>63.2</b>	Fair-Good
2003	30.0	2.9	1.0	5.3	-1.2	5.7	0.0	<b>43.7</b>	Poor
2008	30.0	0.8	0.8	12.8	-2.0	10.0	0.0	<b>52.5</b>	Fair
2013	30.0	7.8	3.5	12.1	-9.0	10.0	0.0	<b>54.5</b>	Fair

## HERBACEOUS TRENDS--

Management unit 28, Study no: 4

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Agropyron cristatum	-	8	-	7	-	-	.06	-	.07	-
G	Agropyron smithii	b216	a154	a112	b208	a116	4.04	1.58	.94	3.70	2.49
G	Agropyron spicatum	-	2	3	-	-	-	.00	.03	-	-
G	Bromus ciliatus	2	-	-	-	-	.01	-	-	-	-
G	Bromus tectorum (a)	a44	b193	b159	b195	c339	.11	2.90	1.62	2.71	11.96
G	Poa fendleriana	b52	ab35	a14	a19	ab24	1.52	.95	.40	.32	.50
G	Poa pratensis	a-	c51	b15	cd63	d86	-	2.20	.28	1.69	1.93
G	Poa secunda	3	2	-	6	-	.01	.01	-	.04	-
G	Sitanion hystrix	c129	bc95	b69	a26	ab65	2.17	1.43	.78	.36	.63
G	Stipa comata	b36	a2	a3	a3	a4	.18	.01	.03	.03	.18
G	Stipa lettermani	b31	b36	a6	a4	a10	.51	.22	.18	.18	.33
Total for Annual Grasses		44	193	159	195	339	0.11	2.90	1.62	2.71	11.96
Total for Perennial Grasses		469	385	222	336	305	8.46	6.47	2.66	6.41	6.07
Total for Grasses		513	578	381	531	644	8.57	9.37	4.29	9.12	18.03
F	Agoseris glauca	a-	a4	a6	b27	b33	-	.04	.07	.53	.31
F	Allium sp.	3	1	-	6	6	.00	.00	-	.01	.01
F	Alyssum alyssoides (a)	-	-	-	-	10	-	-	-	-	.02
F	Arabis holboellii	b30	a2	a-	a6	a3	.06	.01	-	.01	.00
F	Astragalus convallarius	9	5	10	8	4	.67	.06	.12	.07	.03
F	Astragalus oophorus	b17	a1	a-	c23	c36	.07	.09	-	.70	1.24
F	Astragalus pangucensis	b9	b28	-	-	-	.03	.36	-	-	-
F	Balsamorhiza sagittata	-	2	-	2	3	-	.00	-	.15	.03
F	Calochortus nuttallii	a-	ab5	ab4	b10	ab7	-	.01	.01	.07	.01
F	Chaenactis douglasii	c34	b13	a-	a-	a-	.17	.02	-	-	-
F	Cirsium wheeleri	b26	ab17	a1	a4	ab20	.38	.41	.01	.20	.62
F	Collinsia parviflora (a)	a122	c306	d400	d364	b185	.55	2.22	9.04	4.51	.45
F	Comandra pallida	9	7	12	8	5	.03	.03	.07	.10	.03
F	Cordylanthus kingii (a)	-	-	5	-	-	-	-	.03	-	-
F	Crepis acuminata	a9	ab6	a5	ab11	b30	.04	.05	.07	.25	.18
F	Cryptantha sp.	-	-	1	1	-	-	-	.00	.00	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
F	<i>Delphinium nuttallianum</i>	a-	a-	a-	b21	a1	-	-	-	.08	.00
F	<i>Erigeron eatonii</i>	-	2	1	-	-	-	.00	.00	-	-
F	<i>Eriogonum alatum</i>	-	-	-	-	3	-	-	-	-	.00
F	<i>Eriogonum racemosum</i>	b35	ab24	a9	ab23	ab8	.28	.14	.05	.15	.14
F	<i>Eriogonum umbellatum</i>	18	8	3	11	12	.07	.09	.01	.07	.21
F	<i>Gayophytum ramosissimum(a)</i>	a-	a-	ab9	b13	ab4	-	-	.01	.02	.01
F	<i>Ipomopsis aggregata</i>	-	-	-	-	2	-	-	-	-	.00
F	<i>Lappula occidentalis (a)</i>	a-	a-	ab2	b12	b8	-	-	.00	.02	.05
F	<i>Linum lewisii</i>	-	2	-	2	-	-	.03	-	.03	.00
F	<i>Lithospermum sp.</i>	-	4	-	-	-	-	.03	-	-	-
F	<i>Lomatium sp.</i>	b9	a-	a-	d61	c25	.03	-	.00	.46	.09
F	<i>Lupinus argenteus</i>	b47	b59	ab38	a24	b55	1.42	3.22	1.65	.88	1.18
F	<i>Machaeranthera canescens</i>	5	2	-	-	-	.04	.00	-	-	-
F	<i>Microsteris gracilis (a)</i>	b122	a73	b148	a51	b122	.44	.26	1.08	.20	.42
F	<i>Navarretia intertexta (a)</i>	-	-	2	1	-	-	-	.03	.00	-
F	<i>Penstemon sp.</i>	-	-	2	2	-	-	-	.03	.00	-
F	<i>Phlox longifolia</i>	d188	b127	a56	bc109	ab71	1.03	.97	.24	.90	.51
F	<i>Polygonum douglasii (a)</i>	-	4	-	5	-	-	.04	-	.01	-
F	<i>Ranunculus testiculatus (a)</i>	-	-	-	3	7	-	-	-	.00	.01
F	<i>Senecio multilobatus</i>	1	1	-	-	1	.00	.00	-	-	.00
F	<i>Sphaeralcea coccinea</i>	4	4	4	-	-	.01	.01	.00	-	-
F	<i>Taraxacum officinale</i>	1	-	-	-	1	.03	-	-	-	.00
F	<i>Tragopogon dubius (a)</i>	2	7	-	-	5	.00	.04	-	-	.01
F	<i>Trifolium sp.</i>	43	45	31	70	52	.15	.31	.11	.84	.16
F	<i>Zigadenus paniculatus</i>	b40	a6	b39	c79	b39	.82	.04	.37	2.59	.97
Total for Annual Forbs		246	390	566	449	341	0.99	2.57	10.21	4.78	0.98
Total for Perennial Forbs		537	375	222	508	417	5.37	5.98	2.87	8.15	5.79
Total for Forbs		783	765	788	957	758	6.37	8.55	13.08	12.94	6.78

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

#### BROWSE TRENDS--

Management unit 28, Study no: 4

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata vaseyana</i>	24.29	24.87	27.41	18.91	19.36	34.73	30.66	35.23
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	-	-	.00	-	-	-	-
B	<i>Juniperus scopulorum</i>	-	.03	.53	.63	.85	.70	.86	1.10
B	<i>Mahonia repens</i>	-	-	.03	-	-	-	-	-
B	<i>Opuntia sp.</i>	1.29	1.04	.57	1.90	1.04	.33	1.40	.81
B	<i>Purshia tridentata</i>	5.57	8.25	6.44	4.64	6.42	6.55	8.25	14.04
B	<i>Quercus gambelii</i>	1.62	.56	.41	.03	.18	1.00	.78	1.16
B	<i>Symphoricarpos oreophilus</i>	.77	3.24	1.67	2.47	3.31	1.61	2.98	6.46

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
Total for Browse		33.56	38.00	37.07	28.59	31.17	44.92	44.93	58.8

BASIC COVER--

Management unit 28, Study no: 4

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	42.98	50.01	48.49	44.65	52.03
Rock	5.53	4.95	3.55	4.16	5.14
Pavement	1.26	1.68	.55	.91	.24
Litter	59.12	66.60	53.10	57.17	47.21
Cryptogams	1.64	.98	.21	.46	.80
Bare Ground	14.50	16.27	18.33	19.09	15.19

PELLET GROUP DATA--

Management unit 28, Study no: 4

Type	Quadrat Frequency					Days use per acre (ha)			
	'92	'98	'03	'08	'13	'98	'03	'08	'13
Sheep	-	1	6	-	-	-	12 (30)	-	-
Rabbit	44	22	37	69	7	-	-	-	-
Elk	-	1	-	-	-	-	-	1 (3)	-
Deer	28	37	20	26	15	49 (121)	51 (126)	43 (106)	50 (124)
Cattle	-	2	1	4	-	7 (17)	1 (2)	6 (14)	4 (11)

BROWSE CHARACTERISTICS--

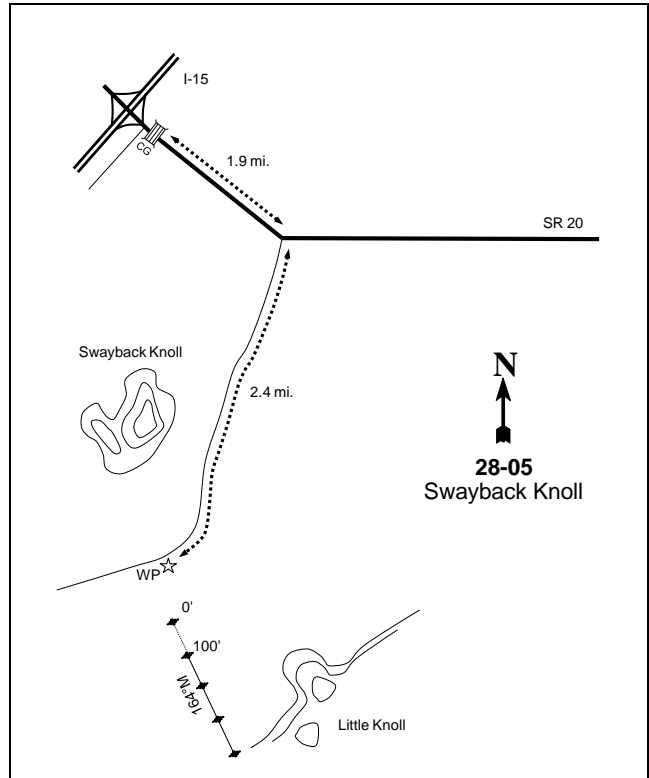
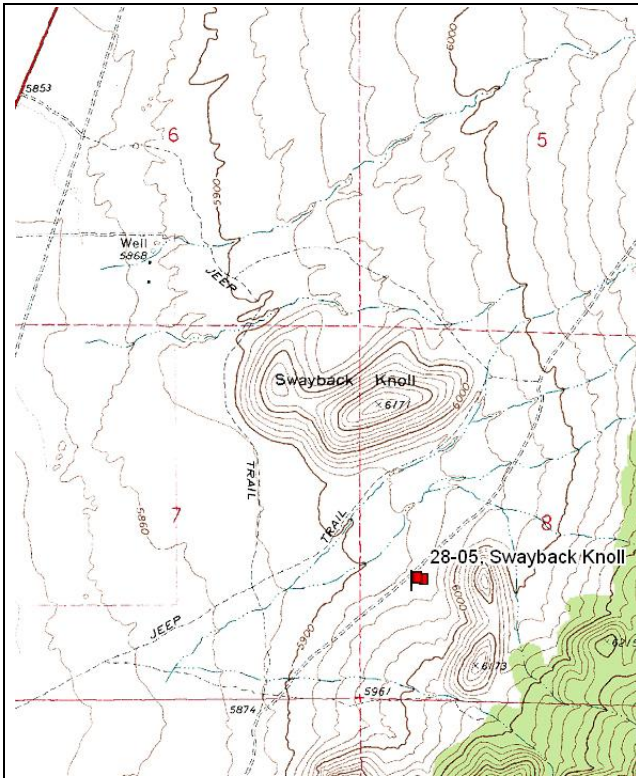
Management unit 28, Study no: 4

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
92	<b>8980</b>	3	41	56	160	49	32	16	-/-	
98	<b>5160</b>	4	71	26	200	40	5	8	29/37	
03	<b>4620</b>	1	55	44	-	10	3	13	35/37	
08	<b>5620</b>	2	47	51	460	5	2	17	33/35	
13	<b>4020</b>	6	68	26	140	35	15	8	36/38	
<i>Cercocarpus ledifolius</i>										
92	<b>0</b>	0	0	-	20	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus depressus</b>										
92	20	0	100	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	8/28	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	6/16	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
92	40	100	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	60	0	0	0	6/10	
13	0	0	0	-	-	0	0	0	-/-	
<b>Juniperus scopulorum</b>										
92	20	100	0	-	-	100	0	0	-/-	
98	20	0	100	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	-/-	
<b>Mahonia repens</b>										
92	0	0	0	0	-	0	0	0	-/-	
98	0	0	0	0	-	0	0	0	-/-	
03	20	0	100	0	-	0	0	0	3/4	
08	20	0	0	100	-	0	0	100	3/6	
13	0	0	0	0	-	0	0	0	-/-	
<b>Opuntia sp.</b>										
92	2140	38	52	9	100	0	2	20	-/-	
98	740	16	76	8	-	0	3	5	6/13	
03	840	5	79	17	-	0	2	5	7/14	
08	980	0	90	10	60	0	2	14	6/17	
13	580	0	97	3	20	7	7	14	5/16	
<b>Purshia tridentata</b>										
92	3080	34	55	10	140	34	53	3	-/-	
98	1900	15	82	3	180	36	47	2	22/35	
03	1860	3	73	24	-	13	72	3	22/35	
08	1760	0	68	32	140	22	57	3	22/33	
13	1640	10	72	18	80	18	60	44	28/39	
<b>Quercus gambelii</b>										
92	460	22	70	9	120	43	0	9	-/-	
98	400	10	90	0	20	0	0	0	75/39	
03	380	47	0	53	-	0	0	0	58/32	
08	200	70	10	20	-	0	0	10	55/16	
13	220	9	91	0	-	0	0	0	44/16	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Symphoricarpos oreophilus</b>										
92	<b>700</b>	29	69	3	100	57	11	9	-/-	
98	<b>720</b>	17	83	0	-	33	0	0	14/25	
03	<b>980</b>	2	98	0	-	6	29	0	11/18	
08	<b>780</b>	10	90	0	80	3	8	0	13/20	
13	<b>1000</b>	0	100	0	-	2	0	0	16/33	
<b>Yucca sp.</b>										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	-	100	0	100	-/-	

SWAYBACK KNOLL - TREND STUDY NO. 28-5



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Buckhorn Flat; Township 32S, Range 7W, Section 8  
NAD 83, UTM Zone 12, 352598 East 4210821 North

**Transect Information**

Browse Tag # (0' Stake)	477
Transect Bearing	164° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)
Belt Marker Placement	Standard

**Directions to Site**

From the cattleguard off SR 20 and I-15, travel 1.9 miles on SR 20 to a dirt road on the right. Travel south for 2.4 miles to a sage flat west of rocky knolls. There is a witness post on the left (east) side of the road. The 0-foot baseline stake is 200 feet away from the witness post at a bearing of 118° magnetic. The 0-foot stake is marked by browse tag #477.



**Site Information**

Land Ownership BLM  
 Allotment Bone Hollow  
 Elevation 5,940ft (1,811m)  
 Aspect Northwest  
 Slope 6%  
 Sample Dates 08/24/1987, 07/30/1992, 06/22/1998, 06/10/2003, 06/04/2008, 06/04/2013  
 DISTURBANCE HISTORY--

Management unit 28, Study no: 5

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Wildfire	Laub Fire	-	Summer 2013	40
Seeding (Broadcast After)	Laub and Cotton Fire Rehab	<a href="#">2469</a>	Fall 2013	43
Seeding (Browse Seed Planter)	Laub and Cotton Fire Rehab	<a href="#">2469</a>	Fall 2013	43

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 28, Study no: 5

Project Name: Laub and Cotton Fire Rehab			
WRI Database #: <a href="#">2469</a>			
Application: Broadcast		Acres: 43	
Seed type		lbs in mix	lbs/acre
G	Indian Ricegrass 'Nezpar'	20	.47
F	Sainfoin 'Eski'	40	.93
F	Small Burnet 'Delar'	40	.93
S	Bitterbrush	100	2.33
S	Fourwing Saltbush	20	.47
Total Pounds		220	5.13
PLS Pounds:			4.64

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 5

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1985-2008	Wyoming Big Sagebrush	Phase I
2013	Annual Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This study is located on an alluvial fan which is at the base of the foothills east of I-15 and just south of Highway 20. This study samples one of the key wintering areas for mule deer on the east side of I-15, and has been used by as many as 400 deer during winter months. This area is bordered by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) covered hills, which provide the nearest protective cover. Winter range in this particular area is limited by the deer-proof fence along I-15 as well as agricultural land that is also being fenced to prevent deer depredation. Deer presence has been high in all sample years.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed, mesic Petrocalcic Palexerolls  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)

NRCS Ecological Site #

R028AY220UT

SOIL ANALYSIS DATA--

Management unit 28, Study no: 5

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	49.8	30.4	19.8	6.7	0.4	1.1	9.7	67.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 1987, the site was predominantly Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with a small component of perennial grass which provided limited cover (Appendix B -Pre-1992 Data). Over the sample years, cheatgrass (*Bromus tectorum*) has varied in frequency and cover on the site, but had particularly high cover in 1998, though perennial native shrubs, forbs, and grasses still made up the majority of the vegetative cover. In 2013, there was a wildfire on this site that removed most of the shrub cover and allowed cheatgrass to become dominant (Table - Browse Trends, Table - Herbaceous Trends, Table - Disturbance History).

Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 28, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	13.9	6.3	8.0	11.8	-0.9	0.1	0.0	<b>39.2</b>	Fair
1998	15.6	8.4	6.0	6.8	-14.6	0.2	0.0	<b>22.3</b>	Poor
2003	23.5	5.1	2.0	6.4	-1.7	0.0	0.0	<b>35.3</b>	Fair
2008	15.2	-0.3	3.5	9.6	-1.7	0.3	0.0	<b>26.5</b>	Poor-Fair
2013	0.6	0.0	0.0	3.8	-15.1	0.4	0.0	<b>-10.2</b>	Very Poor

HERBACEOUS TRENDS--

Management unit 28, Study no: 5

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Aristida purpurea	b <sub>46</sub>	b <sub>31</sub>	b <sub>30</sub>	b <sub>30</sub>	a <sub>5</sub>	1.31	.94	.55	.45	.15
G	Bouteloua gracilis	a <sup>-</sup>	ab <sub>4</sub>	a <sub>1</sub>	a <sup>-</sup>	b <sub>9</sub>	-	.15	.00	-	.17
G	Bromus tectorum (a)	b <sub>184</sub>	e <sub>442</sub>	a <sub>110</sub>	c <sub>299</sub>	d <sub>401</sub>	.68	19.37	.98	2.20	19.69
G	Hilaria jamesii	b <sub>52</sub>	ab <sub>35</sub>	ab <sub>27</sub>	ab <sub>34</sub>	a <sub>29</sub>	.90	.39	.83	1.28	.58
G	Oryzopsis hymenoides	5	6	9	2	3	.09	.23	.18	.02	.03
G	Poa secunda	-	-	-	3	-	-	-	-	.01	-
G	Sitanion hystrix	b <sub>96</sub>	ab <sub>63</sub>	ab <sub>63</sub>	b <sub>86</sub>	a <sub>37</sub>	3.43	1.42	1.25	2.89	.93
G	Stipa comata	11	15	12	10	4	.15	.25	.36	.13	.03
G	Vulpia octoflora (a)	b <sub>146</sub>	a <sub>63</sub>	b <sub>181</sub>	a <sub>46</sub>	b <sub>144</sub>	.51	.16	1.24	.10	.46

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
	Total for Annual Grasses	330	505	291	345	545	1.19	19.53	2.22	2.30	20.16
	Total for Perennial Grasses	210	154	142	165	87	5.90	3.39	3.19	4.79	1.91
	Total for Grasses	540	659	433	510	632	7.09	22.92	5.42	7.09	22.07
F	Allium sp.	1	-	-	-	-	.00	-	-	-	-
F	Calochortus flexuosus	ab13	a2	a3	b20	a3	.02	.01	.00	.06	.00
F	Descurainia pinnata (a)	22	2	9	7	15	.04	.03	.05	.02	.07
F	Draba sp. (a)	a-	a3	a4	a-	b24	-	.00	.01	-	.05
F	Eriogonum cernuum (a)	c24	a-	a3	b14	bc20	.06	-	.00	.06	.27
F	Gayophytum ramosissimum(a)	a-	a-	a-	b25	b16	-	-	-	.09	.09
F	Gilia sp. (a)	e173	a-	c65	b11	d123	.38	-	.57	.03	.61
F	Hackelia patens	5	-	-	-	-	.01	-	-	-	-
F	Lappula occidentalis (a)	a-	ab1	ab3	c36	b21	-	.00	.01	.08	.09
F	Mentzelia albicaulis (a)	a-	a-	a-	a-	b15	-	-	-	-	.23
F	Mentzelia sp.	-	-	-	-	-	-	-	-	.00	-
F	Microsteris gracilis (a)	12	-	-	-	-	.02	-	-	-	-
F	Navarretia intertexta (a)	a-	a-	ab4	b12	c20	-	-	.00	.02	.10
F	Orobancha fasciculata	-	1	-	-	-	-	.00	-	-	-
F	Phlox longifolia	5	5	-	5	1	.01	.01	-	.04	.00
F	Plantago patagonica (a)	a13	b57	a6	a5	a15	.04	.38	.01	.01	.03
F	Ranunculus testiculatus (a)	b12	b50	a-	d328	c225	.04	.35	-	1.84	1.28
F	Sisymbrium altissimum (a)	a-	a-	a-	a9	b18	-	-	-	.07	.34
F	Sphaeralcea coccinea	6	4	1	4	-	.01	.06	.00	.03	-
F	Sphaeralcea grossulariifolia	-	-	-	-	3	-	-	-	-	.18
F	Stephanomeria tenuifolia	-	-	-	-	1	-	-	-	-	.03
	Total for Annual Forbs	256	113	94	447	512	0.59	0.78	0.66	2.23	3.18
	Total for Perennial Forbs	30	12	4	29	8	0.06	0.09	0.00	0.14	0.22
	Total for Forbs	286	125	98	476	520	0.66	0.87	0.67	2.37	3.41

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

#### BROWSE TRENDS--

Management unit 28, Study no: 5

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	11.11	12.46	18.76	12.12	.51	16.26	11.06	.76
B	Opuntia sp.	-	-	-	.15	-	-	-	-
B	Opuntia whipplei	1.25	.59	1.14	1.77	-	1.15	1.10	-
	Total for Browse	12.36	13.06	19.90	14.04	0.51	17.41	12.16	0.76

BASIC COVER--

Management unit 28, Study no: 5

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	15.86	34.86	28.36	23.85	27.05
Rock	17.98	8.12	13.07	12.06	13.10
Pavement	9.97	21.18	25.84	18.45	12.64
Litter	22.08	34.53	25.44	35.67	12.13
Cryptogams	.22	.51	.06	1.02	.00
Bare Ground	31.76	16.11	21.64	19.29	43.62

PELLET GROUP DATA--

Management unit 28, Study no: 5

Type	Quadrat Frequency				
	'92	'98	'03	'08	'13
Rabbit	68	18	30	89	33
Elk	-	1	1	-	-
Deer	59	32	38	54	13

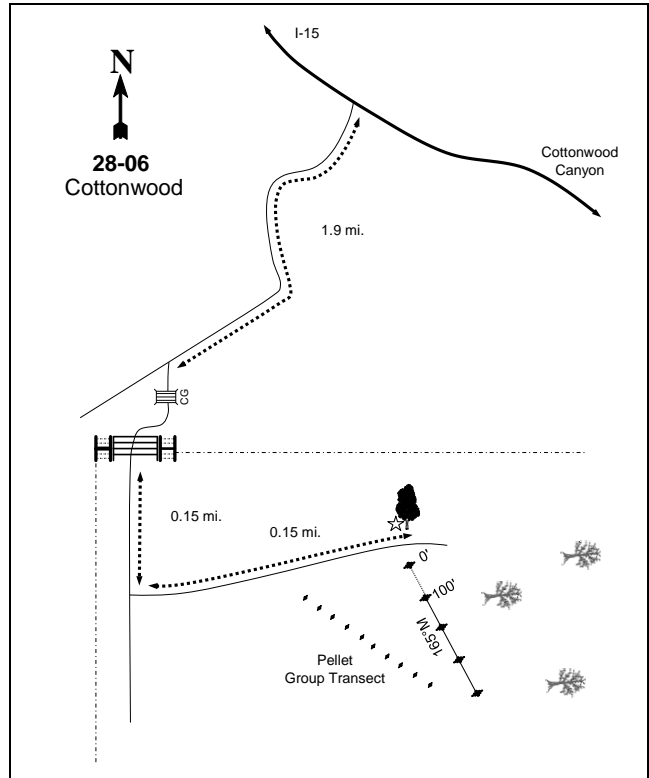
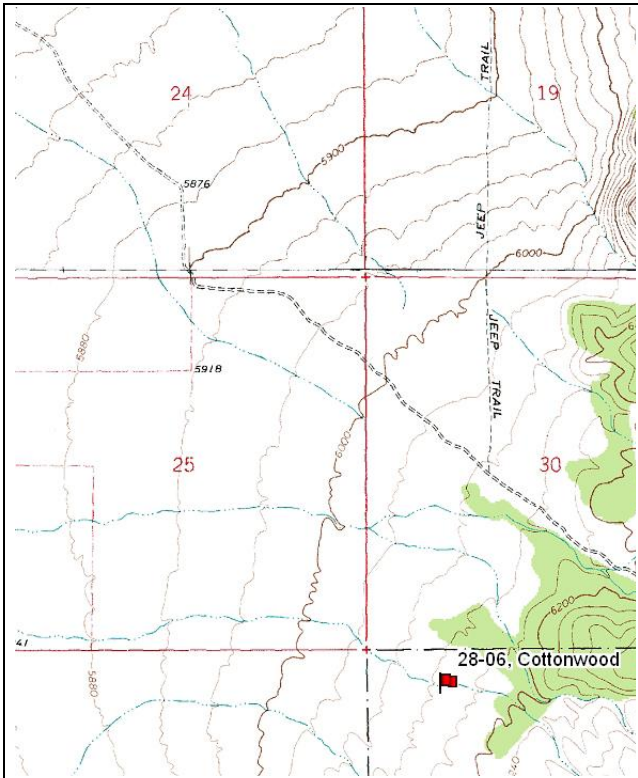
Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	1 (2)	-	-
82 (202)	83 (205)	93 (230)	14 (35)

BROWSE CHARACTERISTICS--

Management unit 28, Study no: 5

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>									
92	<b>5900</b>	16	55	29	480	52	22	9	-/-
98	<b>4240</b>	12	66	22	540	42	8	3	21/27
03	<b>5220</b>	4	63	33	-	48	37	12	20/25
08	<b>4520</b>	7	42	51	1260	42	44	20	19/26
13	<b>440</b>	0	59	41	-	0	82	9	16/33
<i>Opuntia sp.</i>									
92	<b>0</b>	0	0	0	-	0	0	0	-/-
98	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>40</b>	0	100	0	-	0	0	0	4/6
08	<b>40</b>	0	0	100	-	0	0	100	6/15
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Opuntia whipplei</i>									
92	<b>660</b>	3	88	9	100	0	0	0	-/-
98	<b>360</b>	6	89	6	-	6	0	6	13/34
03	<b>320</b>	0	75	25	-	0	0	13	12/27
08	<b>260</b>	0	46	54	-	0	0	23	13/32
13	<b>20</b>	0	100	0	-	0	0	0	7/27

COTTONWOOD - TREND STUDY NO. 28-6



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Cottonwood Mountain; Township 32S, Range 7W, Section 31  
NAD 83, UTM Zone 12, 351003 East 4205317 North

**Transect Information**

Browse Tag # (0' Stake)	9006
Transect Bearing	165° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)
Belt Marker Placement	Belt 1: 2ft; belt 3: 2ft

**Directions to Site**

Travel south down the frontage road 6.6 miles from the intersection of SR 20 and the frontage road along the east side of I-15 to a gate on the left. Go through the gate and travel east for 1.9 miles to a cattleguard on the right. From the cattleguard, go 0.15 miles south along the fence. Turn left on an old road going up into the chaining. Continue 0.15 miles to the study site on the south side of the road. Stop next to a large pinyon. From large pinyon, walk 75 feet at 130 degrees magnetic. The 0-foot baseline stake is 20 feet south of the road. This 2 foot tall fencepost is marked with a browse tag #9006.

**Site Information**

Land Ownership USFS  
 Allotment Red Creek  
 Elevation 6,110ft (1,862m)  
 Aspect West  
 Slope 3%  
 Sample Dates 08/24/1987, 07/30/1992, 06, 26, 1998, 06/10/2003, 06/04/2008, 06/04/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 6

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1970	-
Seeding	-	-	1970	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 6

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) received heavy utilization in 1987. Deer presence has been high in all sample years (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Semidesert Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY220UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 6

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	61.4	20.4	18.2	7.5	0.5	1.3	7.8	147.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1987, the site has remained in a stable state with Wyoming big sagebrush being the dominant component. Perennial grasses and forbs have been a small component which provided limited cover. Over the sample years shrubs and perennial grasses have decreased while cheatgrass (*Bromus tectorum*) has increased. The resilience of this sagebrush community may be at risk due to the high presences of cheatgrass on this site (USDA-NRCS, 2011). Another threat to the resilience of this site is the encroaching

pinyon pine (*Pinus edulis*) and Utah Juniper (*Juniperus osteosperma*) from the surrounding hills, though it remains in Phase I.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 28, study no: 6

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	12.4	9.0	4.5	10.2	-6.2	5.3	0.0	<b>35.2</b>	Fair
1998	9.5	6.3	3.0	13.8	-13.4	4.6	0.0	<b>23.8</b>	Poor-Fair
2003	15.2	0.3	0.5	6.9	-0.2	8.8	0.0	<b>31.5</b>	Fair
2008	11.1	3.3	2.5	9.7	-9.1	10.0	0.0	<b>27.6</b>	Fair
2013	10.5	7.8	0.0	10.8	-11.4	10.0	0.0	<b>27.7</b>	Fair

#### HERBACEOUS TRENDS--

Management unit 28, Study no: 6

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Agropyron cristatum	25	27	20	17	25	.88	.97	.61	.45	.76
G	Aristida purpurea	ab56	b82	b77	a28	a22	3.03	4.52	2.42	2.17	1.08
G	Bromus tectorum (a)	b357	d461	a50	c421	e476	8.20	17.91	.33	12.07	15.16
G	Elymus junceus	-	-	-	-	2	-	-	-	-	.15
G	Oryzopsis hymenoides	7	8	2	7	9	.07	.10	.03	.40	.50
G	Poa pratensis	-	-	-	-	2	-	-	-	-	.00
G	Poa secunda	-	1	1	3	4	-	.03	.00	.01	.03
G	Sitanion hystrix	b49	b49	a17	ab29	ab32	.93	.86	.19	.68	.27
G	Sporobolus cryptandrus	-	3	-	-	1	-	.00	.00	-	.15
G	Stipa comata	a7	ab23	a13	ab20	b40	.21	.43	.19	1.13	2.45
Total for Annual Grasses		357	461	50	421	476	8.20	17.91	0.33	12.07	15.16
Total for Perennial Grasses		144	193	130	104	137	5.12	6.92	3.46	4.86	5.41
Total for Grasses		501	654	180	525	613	13.32	24.84	3.80	16.93	20.57
F	Ambrosia sp.	5	-	-	-	-	.01	-	-	-	-
F	Calochortus flexuosus	a-	a-	a-	b12	ab3	-	-	-	.02	.00
F	Chaenactis douglasii	-	1	-	3	3	-	.00	-	.01	.00
F	Chenopodium fremontii (a)	3	-	1	-	-	.00	-	.00	-	-
F	Crepis acuminata	-	-	-	9	-	-	-	-	.02	-
F	Cryptantha sp.	-	-	-	-	1	-	-	-	-	.00
F	Cryptantha sp.(a)	a-	a-	a-	b19	a-	-	-	-	.05	-
F	Descurainia pinnata (a)	b43	a-	a1	a1	a-	1.47	-	.00	.00	-
F	Epilobium brachycarpum (a)	-	-	-	-	1	-	-	-	-	.00
F	Erigeron aphanactis	-	2	-	-	1	-	.01	-	.00	.00
F	Eriogonum cernuum (a)	6	-	-	9	12	.04	-	-	.01	.02
F	Gayophytum ramosissimum(a)	a-	a-	a-	b37	a4	-	-	-	.11	.01
F	Gilia sp. (a)	c120	a-	b29	b43	a19	.66	-	.47	.23	.06
F	Ipomopsis aggregata	3	-	-	-	-	.00	-	-	-	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
F	Lappula occidentalis (a)	-	-	-	7	9	-	-	-	.16	.01
F	Lygodesmia sp.	-	-	-	1	-	-	-	-	.00	-
F	Mentzelia albicaulis (a)	a-	a-	a-	b49	a-	-	-	-	.62	-
F	Phlox longifolia	a-	a-	ab7	c21	bc12	-	-	.15	.13	.03
F	Polygonum sp.	3	-	-	5	-	.01	-	-	.01	-
F	Ranunculus testiculatus (a)	a-	a-	a-	b36	b46	-	-	-	.08	.09
F	Senecio multilobatus	2	-	-	-	-	.00	-	-	-	-
F	Sisymbrium altissimum (a)	-	-	-	-	-	-	-	-	.00	.00
F	Sphaeralcea coccinea	a116	a139	a145	b217	b220	2.59	2.29	4.25	7.80	5.51
F	Streptanthus cordatus	-	-	-	1	8	-	-	-	.00	.15
Total for Annual Forbs		172	0	31	201	91	2.18	0	0.48	1.29	0.21
Total for Perennial Forbs		129	142	152	269	248	2.63	2.31	4.41	8.03	5.72
Total for Forbs		301	142	183	470	339	4.81	2.31	4.89	9.32	5.93

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

#### BROWSE TRENDS--

Management unit 28, Study no: 6

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	9.88	7.56	12.17	8.91	8.39	8.21	8.64	8.29
B	Leptodactylon pungens	.15	.03	-	-	-	-	-	-
B	Opuntia sp.	.00	-	-	-	.15	-	-	-
Total for Browse		10.03	7.59	12.17	8.91	8.54	8.21	8.64	8.29

#### BASIC COVER--

Management unit 28, Study no: 6

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	24.98	34.35	22.39	33.71	34.31
Rock	5.65	4.45	5.31	3.55	4.22
Pavement	24.91	16.75	30.56	20.37	8.62
Litter	25.82	38.24	28.77	40.47	51.65
Cryptogams	.01	.24	.10	.10	.07
Bare Ground	21.09	23.68	26.27	17.06	15.24



PELLET GROUP DATA--

Management unit 28, Study no: 6

Type	Quadrat Frequency				
	'92	'98	'03	'08	'13
Rabbit	61	38	35	88	17
Elk	-	1	-	1	-
Deer	57	47	28	65	29
Cattle	2	-	2	2	2

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
7 (17)	3 (7)	1 (2)	-
41 (101)	60 (149)	121 (299)	70 (174)
2 (5)	5 (13)	4 (11)	5 (13)

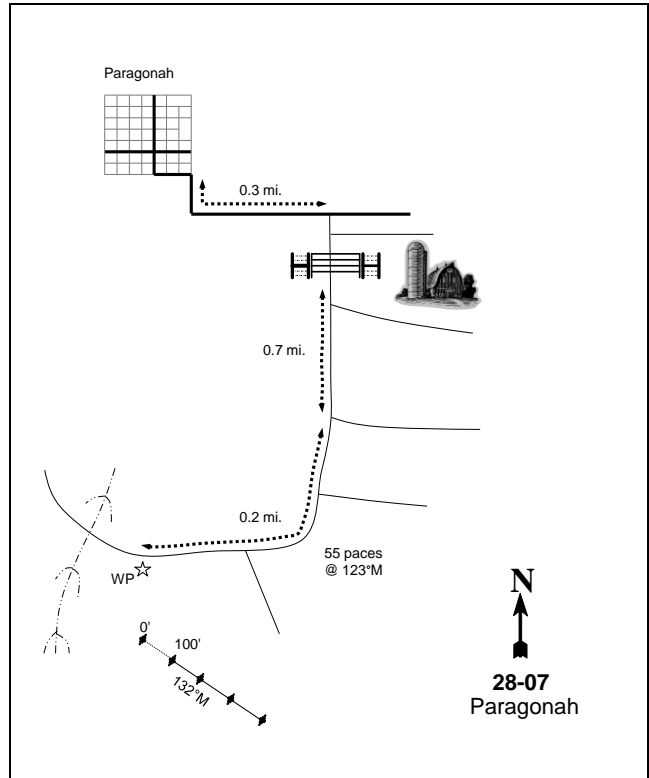
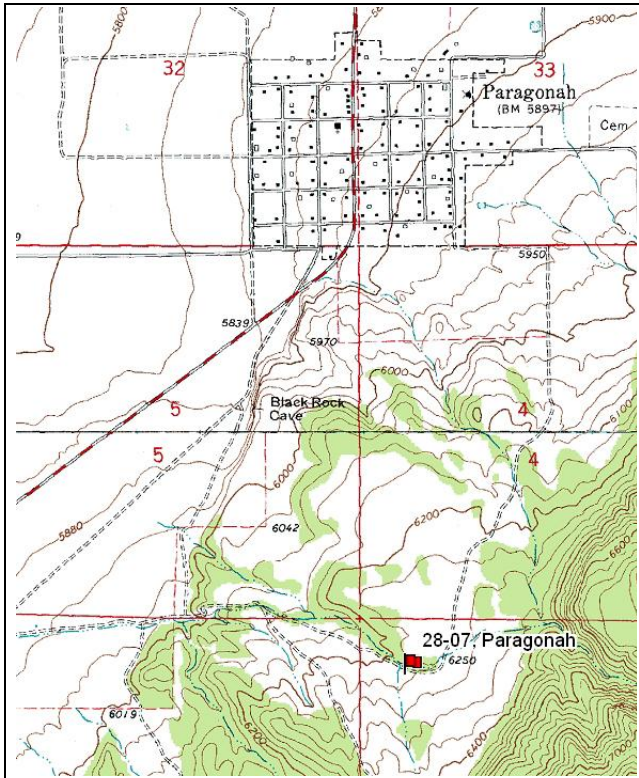
BROWSE CHARACTERISTICS--

Management unit 28, Study no: 6

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>									
92	<b>2320</b>	9	72	20	-	47	11	11	-/-
98	<b>1560</b>	6	64	29	140	64	6	13	26/37
03	<b>1620</b>	1	49	49	-	37	42	17	27/35
08	<b>1580</b>	5	56	39	120	10	42	20	22/33
13	<b>1020</b>	0	76	24	20	24	75	12	23/37
<i>Cowania mexicana stansburiana</i>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	26/50
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Ephedra viridis</i>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	10/12
<i>Juniperus osteosperma</i>									
92	<b>0</b>	0	0	-	-	0	0	0	-/-
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Leptodactylon pungens</i>									
92	<b>60</b>	0	100	-	-	0	0	0	-/-
98	<b>20</b>	0	100	-	-	0	0	0	3/10
03	<b>20</b>	0	100	-	-	0	0	0	6/5
08	<b>20</b>	0	100	-	-	0	0	0	4/8
13	<b>100</b>	0	100	-	-	0	0	0	5/8

		Age class distribution			Utilization				
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Opuntia sp.									
92	<b>200</b>	50	50	-	100	0	0	0	-/-
98	<b>20</b>	0	100	-	-	0	0	0	5/9
03	<b>20</b>	100	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	6/14
13	<b>20</b>	0	100	-	-	100	0	100	-/-

PARAGONAH - TREND STUDY NO. 28-7



**Location Information**

USGS 7.5 min Map Info Parowan; Township 34S, Range 8W, Section 9  
 GPS (0' Stake) NAD 83, UTM Zone 12, 344092 East 4192360 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 132° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From 200 South and 300 East in Paragonah, continue south on 300 East for 0.3 miles to where the road turns south. Drive 0.1 miles to a gate and a barn. Go through a series of two gates and to a fork. Stay right on the road that goes south and drive for 0.7 miles to another fork. Continue south for 0.2 miles (the road will bend and go west) to the witness post on the south (left) side of the road (just beyond the witness post is a large gully). The baseline starts 92 feet at 188° magnetic from the witness post. The study is marked by short fence posts.

**Site Information**

Land Ownership BLM  
 Allotment Not Available  
 Elevation 6,230ft (1,899m)  
 Aspect Northwest  
 Slope 12%  
 Sample Dates 09/02/1987, 07/28/1992, 07/08/1998, 06/11/2003, 06/03/2008, 06/06/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 7

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-
Lop and Scatter	-	-	1998-2003	-
Lop and Scatter	-	-	2008-2013	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 7

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1998	Pinyon-Juniper/Black Sagebrush	Phase II
2003-2013	Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Inactive gullies are on both sides of the study area.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Xeric Haplocalcids  
 NRCS Ecological Site [Upland Gravelly Loam \(Black Sagebrush\)](#)  
 NRCS Ecological Site # R047XB306UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 7

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	65.4	20.4	14.2	6.3	0.4	2.2	6.0	3.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions: No state and transition model is available for the above ecological site.

When established in 1987, the site was a mixed stand of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) that were in phase II of woodland succession. The dominant shrub was black sagebrush (*Artemisia nova*) with a diverse component of other shrub species present which provided limited cover. Crested wheatgrass (*Agropyron cristatum*) made up the majority of the herbaceous understory with a small number of other grasses and forbs (Appendix B -Pre-1992 Data). Between 1998 and 2003, a lop and scatter treatment was done on the site, removing a majority of the trees. Since then black sagebrush has increased in cover and became the dominant browse species on the site (Table - Browse Trends). Crested

wheatgrass remained the dominant understory species; however, the diversity of grasses and forbs has increased (Table - Herbaceous Trends).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 28, study no: 7

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	11.2	10.0	15.0	7.9	-0.2	4.1	0.0	<b>48.0</b>	Good
1998	12.3	11.6	15.0	14.9	-2.6	3.1	0.0	<b>54.3</b>	Good
2003	8.3	7.6	9.3	2.1	-0.3	1.7	0.0	<b>28.7</b>	Fair
2008	13.3	11.6	15.0	18.7	-0.8	4.8	0.0	<b>62.7</b>	Good
2013	15.7	14.4	15.0	11.3	-0.1	5.2	0.0	<b>61.5</b>	Good

#### HERBACEOUS TRENDS--

Management unit 28, Study no: 7

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Agropyron cristatum	b159	b172	a94	b156	ab133	3.39	4.71	.71	6.98	3.65
G	Agropyron intermedium	a30	b63	a16	a31	a32	.49	2.13	.05	.64	.38
G	Agropyron smithii	-	12	-	-	-	-	.02	-	-	-
G	Agropyron spicatum	-	-	-	1	-	-	-	-	.03	-
G	Aristida purpurea	-	-	-	8	2	-	-	-	.19	.06
G	Bromus inermis	-	-	-	-	3	-	-	-	-	.06
G	Bromus tectorum (a)	a48	d256	b98	c170	a62	.33	3.41	.33	1.01	.12
G	Oryzopsis hymenoides	ab9	ab5	a1	a6	b27	.07	.18	.15	.19	.18
G	Poa bulbosa	-	-	-	-	4	-	-	-	-	.01
G	Poa secunda	a3	ab25	ab22	b27	b40	.00	.19	.12	.30	.43
G	Sitanion hystrix	a-	a7	a5	b38	b32	.00	.19	.01	.94	.53
G	Sporobolus cryptandrus	-	-	-	1	9	-	-	-	.06	.33
G	Stipa comata	-	3	-	-	1	-	.00	-	-	.00
G	Vulpia octoflora (a)	a-	a-	b13	a-	c-	-	-	.03	-	-
Total for Annual Grasses		48	256	111	170	62	0.33	3.41	0.36	1.01	0.12
Total for Perennial Grasses		201	287	138	268	283	3.97	7.46	1.04	9.34	5.64
Total for Grasses		249	543	249	438	345	4.30	10.87	1.41	10.35	5.77
F	Alyssum alyssoides (a)	a3	a7	a11	b36	c96	.00	.02	.02	.12	.16
F	Arabis sp.	3	-	-	-	2	.00	-	-	-	.00
F	Artemisia dracunculus	-	4	-	-	-	-	.03	-	-	-
F	Astragalus lentiginosus	2	-	-	5	2	.01	-	-	.06	.03
F	Astragalus newberryi	ab4	ab3	a-	ab8	b12	.01	.01	-	.04	.08
F	Calochortus flexuosus	a-	a-	a-	b21	a7	-	-	-	.27	.01
F	Castilleja linariaefolia	-	-	-	2	-	-	-	-	.01	-
F	Collinsia parviflora (a)	-	-	5	-	-	-	-	.01	-	-
F	Delphinium nuttallianum	a-	a-	a2	b13	ab8	-	-	.00	.22	.02
F	Draba sp. (a)	-	-	7	2	-	-	-	.02	.00	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
F	<i>Erigeron pumilus</i>	12	4	-	4	7	.04	.01	-	.04	.21
F	<i>Eriogonum cernuum</i> (a)	2	-	-	-	-	.00	-	-	-	-
F	<i>Eriogonum racemosum</i>	1	-	3	4	1	.00	-	.00	.06	.00
F	<i>Eriogonum umbellatum</i>	1	3	4	6	4	.03	.01	.00	.01	.03
F	<i>Euphorbia fendleri</i>	<sub>ab</sub> 81	<sub>a</sub> 58	<sub>a</sub> 41	<sub>a</sub> 52	<sub>b</sub> 92	1.12	.88	.40	.21	1.34
F	<i>Lactuca serriola</i> (a)	1	6	-	-	-	.00	.02	-	-	-
F	<i>Leucelene ericoides</i>	13	10	19	26	25	.22	.30	.36	1.13	.54
F	<i>Lithospermum ruderales</i>	<sub>b</sub> 13	<sub>a</sub> 2	<sub>a</sub> 4	<sub>a</sub> 1	<sub>b</sub> 15	.06	.15	.01	.01	.12
F	<i>Lygodesmia</i> sp.	-	-	-	1	-	-	-	-	.03	-
F	<i>Machaeranthera canescens</i>	3	-	-	3	3	.03	-	-	.15	.03
F	<i>Microsteris gracilis</i> (a)	-	-	5	4	1	-	-	.01	.01	.00
F	<i>Penstemon eatoni</i>	-	-	-	-	-	-	.00	-	-	-
F	<i>Petradoria pumila</i>	-	-	-	-	2	-	-	-	-	.03
F	<i>Phlox longifolia</i>	-	7	7	5	3	-	.01	.01	.01	.01
F	<i>Ranunculus testiculatus</i> (a)	<sub>a</sub> 19	<sub>a</sub> 7	<sub>b</sub> 107	<sub>a</sub> 46	<sub>b</sub> 89	.09	.02	.74	.08	.21
F	<i>Sphaeralcea coccinea</i>	10	2	1	12	5	.19	.03	.03	.05	.03
F	<i>Sphaeralcea grossulariifolia</i>	-	-	-	-	1	-	-	-	-	.00
F	<i>Streptanthus cordatus</i>	11	11	10	13	13	.31	.09	.02	.05	.08
F	<i>Taraxacum officinale</i>	-	-	-	5	-	-	-	-	.01	-
F	<i>Tragopogon dubius</i> (a)	-	-	-	-	8	-	-	-	.03	.02
Total for Annual Forbs		25	20	135	88	194	0.10	0.06	0.80	0.26	0.40
Total for Perennial Forbs		154	104	91	181	202	2.05	1.55	0.85	2.41	2.61
Total for Forbs		179	124	226	269	396	2.15	1.61	1.66	2.67	3.01

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

#### BROWSE TRENDS--

Management unit 28, Study no: 7

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia nova</i>	4.31	5.88	3.88	9.34	8.98	3.26	4.41	10.25
B	<i>Artemisia tridentata vaseyana</i>	.03	.15	-	.06	.34	-	.08	1.31
B	<i>Chrysothamnus nauseosus</i>	.00	-	-	.15	.38	-	.13	.65
B	<i>Eriogonum microthecum</i>	1.05	.07	.03	.03	.03	-	-	.20
B	<i>Gutierrezia sarothrae</i>	1.46	.79	1.07	1.18	.59	.61	.30	1.23
B	<i>Juniperus osteosperma</i>	1.92	1.26	-	-	-	.40	-	-
B	<i>Leptodactylon pungens</i>	.27	.39	.15	.42	.64	.03	.21	.61
B	<i>Opuntia</i> sp.	.03	.04	.15	.15	.15	-	.01	-
B	<i>Pediocactus simpsonii</i>	-	-	-	-	.00	-	-	-
B	<i>Pinus edulis</i>	8.71	9.66	.39	.16	.04	.50	2.91	-
B	<i>Quercus gambelii</i>	4.50	4.66	3.42	1.51	4.00	5.31	1.41	5.48
Total for Browse		22.32	22.91	9.11	13.02	15.16	10.11	9.46	19.73

POINT-QUARTER TREE DATA--

Management unit 28, Study no: 7

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	49	-	21	31
Pinus edulis	71	18	48	51

Average diameter (in)			
'98	'03	'08	'13
4.7	-	1.2	1.6
5.1	1.0	3.9	1.6

BASIC COVER--

Management unit 28, Study no: 7

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	25.71	35.17	11.72	22.99	27.85
Rock	29.99	9.75	7.34	6.84	8.13
Pavement	0	18.49	9.14	12.12	9.69
Litter	34.60	47.87	57.23	52.14	51.30
Cryptogams	2.03	2.18	1.27	.38	.12
Bare Ground	24.43	17.53	20.29	18.04	12.82

PELLET GROUP DATA--

Management unit 28, Study no: 7

Type	Quadrat Frequency				
	'92	'98	'03	'08	'13
Sheep	2	-	-	-	-
Rabbit	84	56	24	50	10
Elk	-	1	-	-	-
Deer	26	28	4	26	15

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
-	-	-	1 (3)
23 (57)	23 (58)	29 (73)	19 (48)

BROWSE CHARACTERISTICS--

Management unit 28, Study no: 7

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier alnifolia</b>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	15/28
<b>Artemisia nova</b>									
92	4300	20	51	29	440	53	22	1	-/-
98	2540	19	61	20	100	13	0	3	11/21
03	2960	5	53	43	-	9	4	11	9/15
08	4480	33	54	13	3040	28	4	3	10/22
13	4940	30	66	3	180	20	1	6	10/21

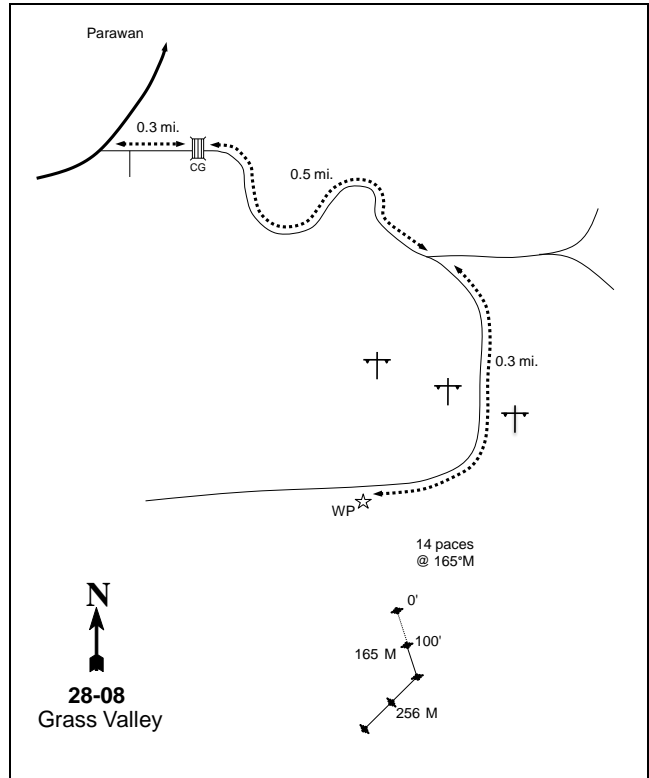
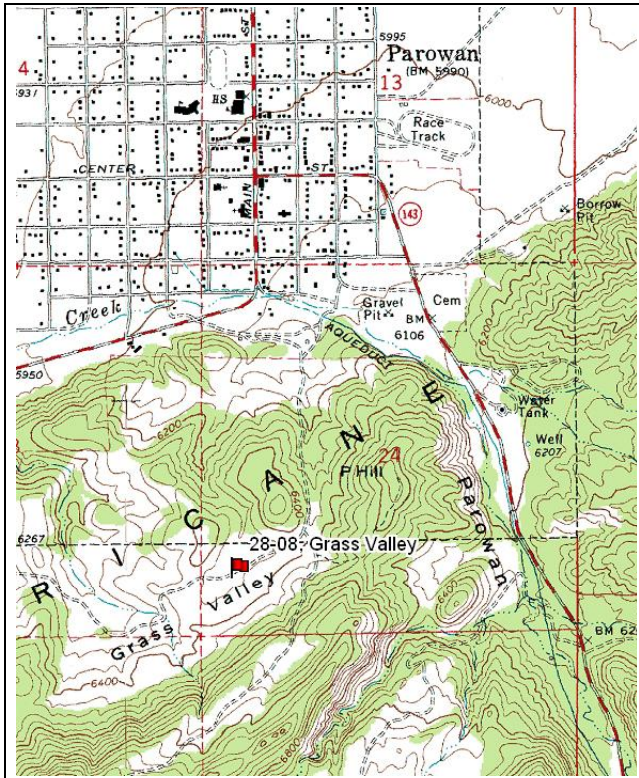
		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
92	280	43	36	21	40	21	14	0	-/-	
98	240	25	50	25	20	25	0	0	14/26	
03	60	0	33	67	-	0	33	33	22/33	
08	180	56	33	11	-	11	0	11	24/38	
13	340	35	65	0	60	18	6	35	12/19	
<i>Brickellia sp.</i>										
92	20	0	100	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	9/10	
<i>Cercocarpus montanus</i>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	8/9	
13	0	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus nauseosus</i>										
92	20	100	0	0	20	0	0	0	-/-	
98	40	0	100	0	-	0	0	0	8/12	
03	0	0	0	0	-	0	0	0	-/-	
08	80	0	50	50	-	0	0	25	10/8	
13	20	0	100	0	-	0	0	0	35/42	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	15/25	
<i>Eriogonum microthecum</i>										
92	520	23	77	0	20	4	8	0	-/-	
98	140	57	29	14	-	0	29	29	7/11	
03	80	0	100	0	-	0	25	0	5/6	
08	80	25	50	25	20	0	25	25	3/6	
13	280	7	93	0	-	64	0	7	8/11	
<i>Gutierrezia sarothrae</i>										
92	4320	38	62	0	120	0	0	0	-/-	
98	1320	30	68	2	20	0	0	2	9/9	
03	2560	16	83	1	60	0	0	.78	6/6	
08	3040	26	59	14	1000	0	0	11	5/6	
13	3940	53	46	1	60	0	0	1	8/9	



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Juniperus osteosperma</b>										
92	80	0	100	-	20	0	0	0	-/-	
98	40	0	100	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Leptodactylon pungens</b>										
92	600	13	87	0	-	3	0	0	-/-	
98	360	11	83	6	-	0	0	0	7/12	
03	320	19	75	6	-	0	0	6	4/7	
08	820	32	49	20	40	0	0	0	6/8	
13	860	19	67	14	-	0	0	35	7/11	
<b>Opuntia sp.</b>										
92	100	20	60	20	20	0	0	20	-/-	
98	60	33	33	33	20	0	0	67	5/9	
03	60	0	100	0	-	0	0	0	6/11	
08	160	25	75	0	-	0	0	0	4/6	
13	200	20	80	0	-	0	0	10	3/9	
<b>Pediocactus simpsonii</b>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	40	0	100	-	-	0	0	0	1/2	
13	40	50	50	-	-	0	0	0	1/2	
<b>Peraphyllum ramosissimum</b>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	25/28	
<b>Pinus edulis</b>										
92	400	60	40	-	-	0	0	0	-/-	
98	300	27	73	-	60	0	0	0	-/-	
03	0	0	0	-	80	0	0	0	-/-	
08	80	100	0	-	80	0	0	0	-/-	
13	100	100	0	-	60	0	0	0	-/-	
<b>Quercus gambelii</b>										
92	2620	71	20	9	400	9	18	6	-/-	
98	1020	63	37	0	-	0	0	0	87/29	
03	2160	34	62	4	-	0	0	2	59/31	
08	3280	43	57	0	-	0	0	0	76/40	
13	1960	80	20	0	-	0	0	0	31/18	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Tetradymia canescens										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	17/30	

GRASS VALLEY - TREND STUDY NO. 28-8



**Location Information**

USGS 7.5 min Map Info Parowan; Township 34S, Range 9W, Section 24  
 GPS (0' Stake) NAD 83, UTM Zone 12, 339053 East 4188117 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 165° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From I-15 take the north Parowan exit and go south into town. Continue down Main Street to a big gradual curve on the south end of town. Just past the Parowan Heritage Park, turn east off the highway across from a log house onto a road, go past other houses staying on the main road 0.3 miles to cattleguard. From the cattleguard, continue 0.5 miles to a fork. Bear right. Proceed 0.3 miles underneath the power lines to a witness post on left side of the road. The baseline starts 68 feet away at a bearing of 165 degrees magnetic and is marked by 2 foot tall fence posts with no browse tag.

**Site Information**

Land Ownership BLM  
 Allotment P Hill  
 Elevation 6,360ft (1,939m)  
 Aspect Northwest  
 Slope 5%  
 Sample Dates 09/01/1987, 07,28,1992, 07/09/1998, 06/11/2003, 06/03/2008, 06/06/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 8

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Mid 1960's	-
Seeding	-	-	Mid 1960's	-
Lop and Scatter	-	-	1998-2003	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 8

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-1998	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2003-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This site is surrounded by piñon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) covered hills. There is a 3-way exclosure which was built in the late 1970's approximately 0.3 miles west of the site. Deer presence has been high on all sample years (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Clayey-skeletal, mixed, mesic Calcic Argixerolls  
 NRCS Ecological Site Upland Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY309UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 8

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	60.7	20.7	18.6	6.4	0.4	1.7	9.4	192.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1987, the site was predominantly mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a few other shrub species which provided limited cover. Utah juniper (*Juniperus osteosperma*) was encroaching on the site, but it too provided limited cover. Introduced seeded perennial grass species made up the majority of the herbaceous understory. Sometime between 1998 and 2003 a lop and scatter was done

that reduced tree cover. While mountain big sagebrush remains the dominant cover, it has decreased in cover over the sample years. Seeded introduced grasses remain the major component of the herbaceous understory.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 28, study no: 8

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	20.7	-3.0	3.5	30.0	-1.7	0.1	0.0	<b>49.6</b>	Poor-Fair
1998	17.1	4.8	4.5	30.0	-1.6	0.2	0.0	<b>55.0</b>	Fair
2003	20.1	0.9	1.0	24.5	-4.3	0.0	0.0	<b>42.3</b>	Poor
2008	13.0	0.3	2.0	30.0	-0.1	0.2	0.0	<b>45.5</b>	Poor
2013	14.7	1.2	3.0	30.0	0.0	0.1	0.0	<b>49.0</b>	Poor-Fair

#### HERBACEOUS TRENDS--

Management unit 28, Study no: 8

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Agropyron cristatum	ab124	b153	ab107	ab113	a96	6.79	10.14	5.32	7.33	3.91
G	Agropyron intermedium	a193	a139	b167	bc215	c235	8.03	5.08	5.65	9.04	8.59
G	Aristida purpurea	a-	a-	a-	b12	a4	-	.15	.00	.22	.16
G	Bromus inermis	17	20	5	3	21	.25	.21	.06	.03	.66
G	Bromus tectorum (a)	b144	c219	d305	a43	a26	2.27	2.14	5.69	.09	.05
G	Oryzopsis hymenoides	10	5	2	8	6	.21	.04	.03	.42	.06
G	Poa bulbosa	a7	b88	c104	c136	c148	.10	1.10	1.67	2.96	4.10
G	Poa secunda	4	14	17	18	13	.02	.07	.25	.10	.08
G	Sitanion hystrix	cd51	d62	bc29	a1	ab11	1.90	2.02	.55	.03	.22
G	Sporobolus cryptandrus	a-	a-	a-	b25	a4	-	-	-	.21	.03
G	Stipa comata	ab32	a14	a14	ab38	b48	.69	.72	.37	1.49	1.92
Total for Annual Grasses		144	219	305	43	26	2.27	2.14	5.69	0.09	0.05
Total for Perennial Grasses		438	495	445	569	586	18.00	19.54	13.92	21.88	19.74
Total for Grasses		582	714	750	612	612	20.27	21.69	19.61	21.97	19.79
F	Agoseris glauca	a-	a-	a2	b12	ab5	-	-	.00	.05	.04
F	Alyssum alyssoides (a)	a-	a1	a1	a9	b23	-	.00	.00	.01	.04
F	Arabis sp.	-	-	-	1	-	-	-	-	.00	-
F	Astragalus sp.	-	4	-	3	4	-	.06	-	.00	.01
F	Calochortus nuttallii	-	-	-	3	-	-	-	-	.01	-
F	Chaenactis douglasii	-	2	-	-	3	-	.01	-	-	.00
F	Cruciferae	10	4	-	-	-	.04	.01	-	-	-
F	Draba sp. (a)	-	1	-	-	-	-	.00	-	-	-
F	Eriogonum cernuum (a)	7	-	-	-	-	.39	-	-	-	-
F	Gayophytum ramosissimum(a)	a-	a-	b7	c22	ab5	-	-	.02	.06	.01
F	Machaeranthera canescens	-	-	-	-	3	-	-	-	-	.00
F	Microsteris gracilis (a)	a-	ab9	c37	b16	ab10	-	.02	.10	.03	.01
F	Orobancha fasciculata	-	2	-	-	-	-	.00	-	-	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
F	Phlox longifolia	-	-	3	1	2	-	-	.00	.03	.00
F	Polygonum douglasii (a)	<sub>a</sub> 1	<sub>a</sub> 4	<sub>a</sub> -	<sub>b</sub> 12	<sub>ab</sub> 9	.00	.01	-	.04	.01
F	Ranunculus testiculatus (a)	<sub>a</sub> -	<sub>b</sub> 12	<sub>c</sub> 53	<sub>c</sub> 76	<sub>c</sub> 55	-	.03	.21	.26	.11
F	Streptanthus cordatus	-	-	3	-	-	-	-	.00	-	-
F	Taraxacum officinale	4	1	3	-	-	.00	.00	.01	-	-
F	Unknown forb-annual (a)	<sub>b</sub> 42	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	.11	-	-	-	-
F	Zigadenus paniculatus	-	-	-	-	-	-	-	-	.00	-
Total for Annual Forbs		50	27	98	135	102	0.50	0.07	0.34	0.41	0.20
Total for Perennial Forbs		14	13	11	20	17	0.04	0.09	0.02	0.11	0.06
Total for Forbs		64	40	109	155	119	0.55	0.16	0.36	0.52	0.27

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

#### BROWSE TRENDS--

Management unit 28, Study no: 8

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	16.56	13.70	16.11	10.42	11.78	12.75	12.48	14.08
B	Chrysothamnus viscidiflorus	.00	-	-	-	-	-	-	-
B	Juniperus osteosperma	.03	.93	.15	.03	-	-	-	-
B	Leptodactylon pungens	.25	.27	.24	.21	.63	-	.11	.13
B	Pinus edulis	-	-	.00	-	-	-	-	-
Total for Browse		16.84	14.91	16.51	10.66	12.42	12.75	12.59	14.21

#### POINT-QUARTER TREE DATA--

Management unit 28, Study no: 8

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	40	17	37	26	3.4	1.6	2.5	1.1
Pinus edulis	20	7	32	24	4.7	1.3	1.2	1.0

#### BASIC COVER--

Management unit 28, Study no: 8

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	32.46	37.59	35.54	35.48	36.73
Rock	1.86	3.20	3.13	2.15	.88
Pavement	23.53	20.40	11.62	20.28	12.32
Litter	31.48	48.00	34.69	38.73	45.78
Cryptogams	.16	.47	.10	.28	.19
Bare Ground	16.85	21.84	28.43	17.62	15.57

PELLET GROUP DATA--

Management unit 28, Study no: 8

Type	Quadrat Frequency				
	'92	'98	'03	'08	'13
Sheep	-	1	-	-	-
Rabbit	-	48	30	71	13
Elk	-	-	1	-	1
Deer	-	46	30	56	18
Cattle	-	3	3	1	-

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
1 (2)	1 (3)	-	-
61 (151)	57 (141)	96 (236)	59 (146)
9 (22)	11 (27)	4 (11)	1 (2)

BROWSE CHARACTERISTICS--

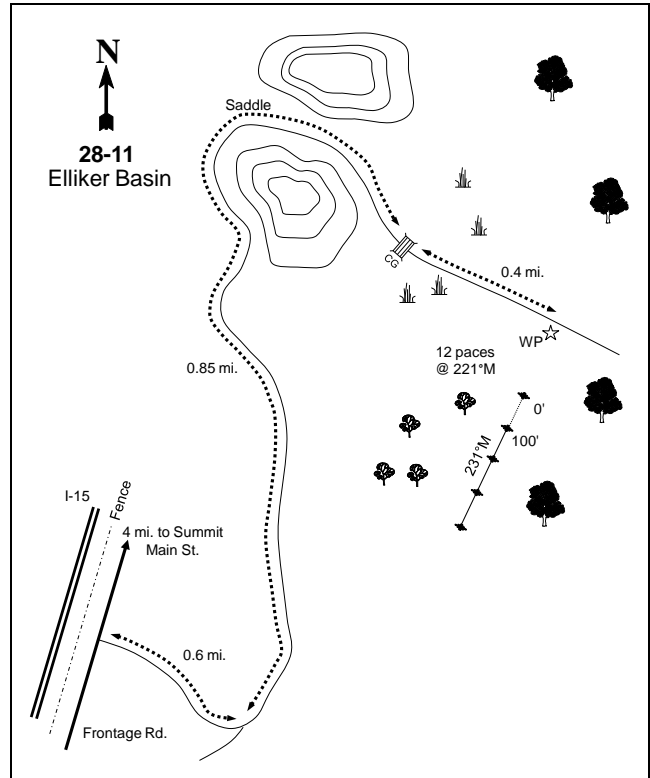
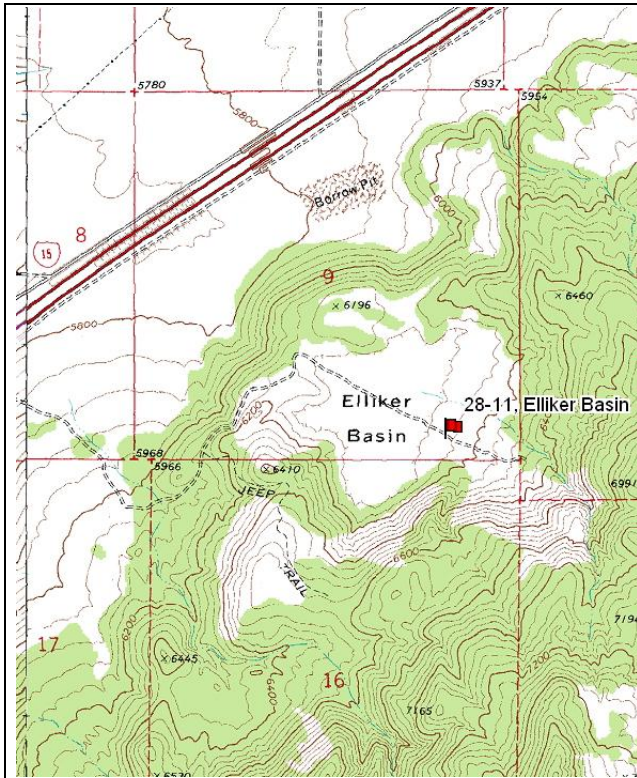
Management unit 28, Study no: 8

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
92	<b>4480</b>	7	33	60	240	41	40	16	-/-	
98	<b>3460</b>	9	57	34	100	47	3	5	25/35	
03	<b>3280</b>	2	51	47	-	35	24	21	22/29	
08	<b>3280</b>	4	47	49	120	49	13	33	22/33	
13	<b>2400</b>	6	48	46	120	52	21	29	18/30	
<i>Cercocarpus montanus</i>										
92	<b>0</b>	0	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	33/29	
<i>Chrysothamnus viscidiflorus</i>										
92	<b>20</b>	100	0	-	-	0	0	0	-/-	
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	15/17	
13	<b>0</b>	0	0	-	-	0	0	0	24/39	
<i>Juniperus osteosperma</i>										
92	<b>0</b>	0	0	-	40	0	0	0	-/-	
98	<b>40</b>	0	100	-	20	0	0	0	-/-	
03	<b>20</b>	0	100	-	-	0	0	0	35/11	
08	<b>20</b>	0	100	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Leptodactylon pungens</i>										
92	<b>920</b>	17	83	0	20	11	9	4	-/-	
98	<b>320</b>	0	100	0	-	0	0	0	6/9	
03	<b>300</b>	0	87	13	-	0	0	7	6/8	
08	<b>340</b>	6	88	6	-	0	0	6	5/8	
13	<b>360</b>	0	100	0	20	0	0	0	5/9	

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>Opuntia sp.</i>									
92	60	0	100	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	3/7
08	0	0	0	-	-	0	0	0	6/16
13	40	0	100	-	-	0	0	50	3/9
<i>Pediocactus simpsonii</i>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	100	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Peraphyllum ramosissimum</i>									
92	0	0	0	-	-	0	0	0	-/-
98	20	0	100	-	-	0	100	0	25/22
03	20	0	100	-	-	0	100	0	27/40
08	0	0	0	-	-	0	0	0	36/67
13	20	100	0	-	-	100	0	0	29/61
<i>Pinus edulis</i>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	20	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	42/81
08	0	0	0	-	-	0	0	0	32/35
13	0	0	0	-	-	0	0	0	20/45



ELLIKER BASIN - TREND STUDY NO. 28-11



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Summit; Township 35S, Range 10W, Section 9  
NAD 83, UTM Zone 12, 325607 East 4181759 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

495  
231° magnetic  
400ft  
Line 1 (11ft & 71ft), Line 2 (34ft), Line 3 (59ft), Line 4 (95ft)  
Belts 1, 2, 4: 3ft; belts 3, 5: 1ft

**Directions to Site**

At the I-15 interchange (exit 71) in Summit, go south on the frontage road (Summer Tree Dr.) on the east side of the freeway for 4.0 miles. Turn left onto a dirt road, proceed through a gate and go east for 0.6 miles. Bear left at the fork and continue 1.25 miles to Elliker Basin and up to a half-high witness post in the sagebrush on the right. The transect starts 12 paces away at a bearing of 221 degrees magnetic. The 0-foot stake is marked with browse tag #495.

**Site Information**

Land Ownership UDWR  
 Allotment West Fork  
 Elevation 6,170ft (1,881m)  
 Aspect West  
 Slope 15%  
 Sample Dates 09/01/1987, 07/31/1992, 06/03/1998, 06/11/2003, 06/03/2008, 06/06/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 11

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Seeding	-	-	Historic	-
Lop and Scatter	-	-	Spring 1992	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 11

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1987-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The transect is located on the southeastern slope of the basin just below the line of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees which continue up the cliffs. Pinyon and juniper dominate the slopes bordering the valley. Deer presence has been high on all sample years (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Calcic Argixerolls  
 NRCS Ecological Site Upland Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY309UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 8

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	50.7	31.4	17.8	5.8	0.5	2.8	10.6	99.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

The site has remained in a stable community of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) since its establishment in 1987. Although there are some seeded perennial introduced grasses on the site perennial native grasses dominate the herbaceous understory. Cheatgrass (*Bromus tectorum*) has been sampled on the site and has fluctuated dramatically in cover over the sample years. In 2013, cheatgrass cover was less than one percent though in the past it has been as high as 32 percent. Mountain big sagebrush cover has steadily declined over the sample years though it has remained the dominant species.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 28, study no: 11

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1992	29.0	-0.3	3.0	9.8	-20.0	0.1	0.0	<b>21.6</b>	Very Poor
1998	29.2	7.5	2.0	15.4	-6.0	0.7	0.0	<b>48.8</b>	Poor-Fair
2003	25.7	-2.1	1.0	12.1	-20.0	0.0	0.0	<b>16.7</b>	Very Poor
2008	17.4	-4.2	1.5	25.0	-0.2	0.4	0.0	<b>39.9</b>	Poor
2013	13.1	6.9	15.0	30.0	-0.3	0.4	0.0	<b>65.0</b>	Fair-Good

## HERBACEOUS TRENDS--

Management unit 28, Study no: 11

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
G	Agropyron intermedium	a <sup>19</sup>	ab <sup>44</sup>	bc <sup>75</sup>	c <sup>94</sup>	d <sup>149</sup>	.89	2.65	2.87	4.71	5.35
G	Aristida purpurea	c <sup>36</sup>	ab <sup>9</sup>	a <sup>9</sup>	bc <sup>41</sup>	abc <sup>29</sup>	.42	.19	.07	.52	.58
G	Bromus tectorum (a)	d <sup>465</sup>	c <sup>402</sup>	cd <sup>428</sup>	a <sup>29</sup>	b <sup>157</sup>	32.16	7.40	25.13	.22	.46
G	Hilaria jamesii	a <sup>23</sup>	ab <sup>34</sup>	ab <sup>33</sup>	bc <sup>49</sup>	c <sup>66</sup>	1.70	1.88	2.24	5.35	5.79
G	Oryzopsis hymenoides	1	-	-	1	9	.03	-	-	.00	.19
G	Poa bulbosa	-	-	20	-	39	-	-	.23	-	.96
G	Poa secunda	a <sup>-</sup>	ab <sup>7</sup>	ab <sup>4</sup>	ab <sup>3</sup>	b <sup>21</sup>	-	.18	.06	.01	.22
G	Sitanion hystrix	ab <sup>13</sup>	a <sup>9</sup>	abc <sup>17</sup>	bc <sup>34</sup>	c <sup>41</sup>	.49	.09	.44	.63	1.82
G	Sporobolus cryptandrus	b <sup>33</sup>	b <sup>50</sup>	a <sup>4</sup>	ab <sup>26</sup>	b <sup>30</sup>	1.23	2.53	.18	1.24	1.89
G	Stipa comata	3	1	6	-	-	.15	.15	.18	.00	.00
G	Vulpia octoflora (a)	b <sup>170</sup>	b <sup>163</sup>	b <sup>197</sup>	a <sup>-</sup>	a <sup>2</sup>	.77	.58	2.33	-	.00
Total for Annual Grasses		635	565	625	29	159	32.94	7.99	27.46	0.22	0.46
Total for Perennial Grasses		128	154	168	248	384	4.91	7.69	6.29	12.49	16.83
Total for Grasses		763	719	793	277	543	37.85	15.68	33.76	12.72	17.29
F	Agoseris glauca	a <sup>-</sup>	b <sup>15</sup>	ab <sup>6</sup>	b <sup>21</sup>	ab <sup>3</sup>	-	.14	.01	.14	.01
F	Artemisia ludoviciana	1	7	-	2	6	.01	.18	-	.00	.18
F	Astragalus sp.	2	-	-	-	1	.03	-	-	-	.00
F	Calochortus nuttallii	-	6	-	1	-	-	.04	-	.00	-
F	Chenopodium sp. (a)	1	-	-	-	-	.00	-	-	-	-
F	Crepis acuminata	-	-	1	-	-	-	-	.00	-	-
F	Draba sp. (a)	a <sup>-</sup>	b <sup>55</sup>	c <sup>75</sup>	a <sup>-</sup>	a <sup>3</sup>	-	.09	.23	-	.00
F	Lappula occidentalis (a)	-	-	7	-	-	-	-	.02	-	-
F	Microsteris gracilis (a)	c <sup>85</sup>	b <sup>39</sup>	c <sup>103</sup>	a <sup>-</sup>	a <sup>2</sup>	.23	.13	.34	-	.00
F	Orobanche fasciculata	1	4	-	2	-	.00	.00	-	.03	-
F	Phacelia heterophylla	-	-	-	-	2	-	-	-	-	.00
F	Phlox longifolia	-	-	-	-	2	-	-	-	-	.00
F	Plantago patagonica (a)	9	4	-	4	-	.01	.01	-	.00	-
F	Ranunculus testiculatus (a)	a <sup>-</sup>	b <sup>23</sup>	b <sup>20</sup>	c <sup>66</sup>	b <sup>50</sup>	-	.10	.04	.14	.08
F	Tragopogon dubius (a)	-	5	-	-	-	-	.01	-	-	-

Type	Species	Nested Frequency					Average Cover %				
		'92	'98	'03	'08	'13	'92	'98	'03	'08	'13
	Total for Annual Forbs	95	126	205	70	55	0.25	0.35	0.64	0.14	0.09
	Total for Perennial Forbs	4	32	7	26	14	0.04	0.36	0.01	0.18	0.20
	Total for Forbs	99	158	212	96	69	0.29	0.71	0.65	0.33	0.29

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

**BROWSE TRENDS--**

Management unit 28, Study no: 11

Type	Species	Quadrat Cover %					Line Intercept Cover %		
		'92	'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata vaseyana</i>	23.91	23.33	20.55	13.93	10.47	15.15	11.95	12.33
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	.15	-	-	-	-	-	-
B	<i>Gutierrezia sarothrae</i>	.15	.03	.15	.00	.04	-	.01	.15
B	<i>Opuntia sp.</i>	.15	.15	.00	.03	-	-	.11	.36
	Total for Browse	24.21	23.66	20.71	13.96	10.51	15.15	12.07	12.84

**BASIC COVER--**

Management unit 28, Study no: 11

Cover Type	Average Cover %				
	'92	'98	'03	'08	'13
Vegetation	47.87	38.07	52.34	26.62	29.72
Rock	48.12	11.02	8.87	9.35	9.28
Pavement	0	27.36	22.20	24.41	15.31
Litter	23.95	41.11	31.04	51.99	53.51
Cryptogams	.04	.12	0	.24	.15
Bare Ground	4.54	9.89	4.15	6.11	3.73

**PELLET GROUP DATA--**

Management unit 28, Study no: 11

Type	Quadrat Frequency				
	'92	'98	'03	'08	'13
Rabbit	26	19	13	54	18
Grouse	-	-	-	-	1
Elk	-	1	1	-	-
Deer	27	47	31	70	50

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
1 (2)	-	16 (40)	3 (8)
44 (109)	151 (374)	106 (261)	163 (403)

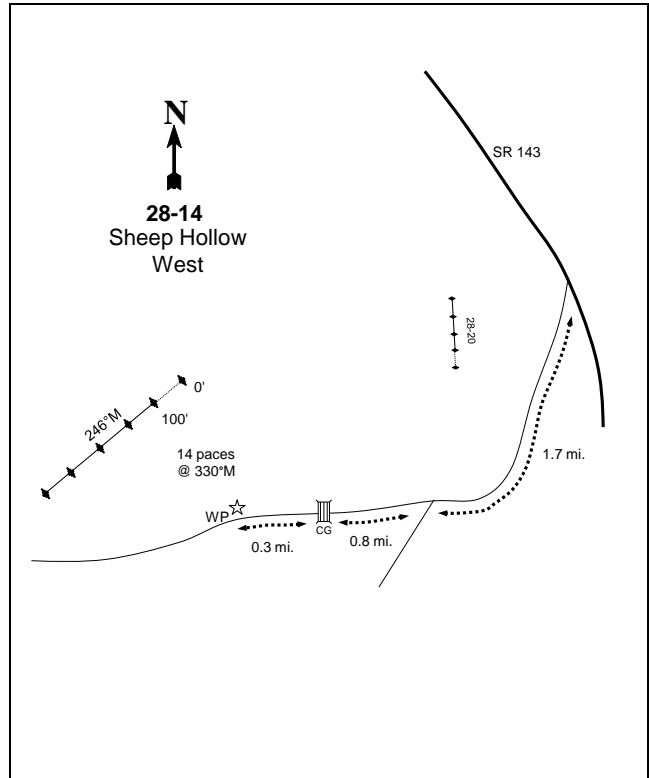
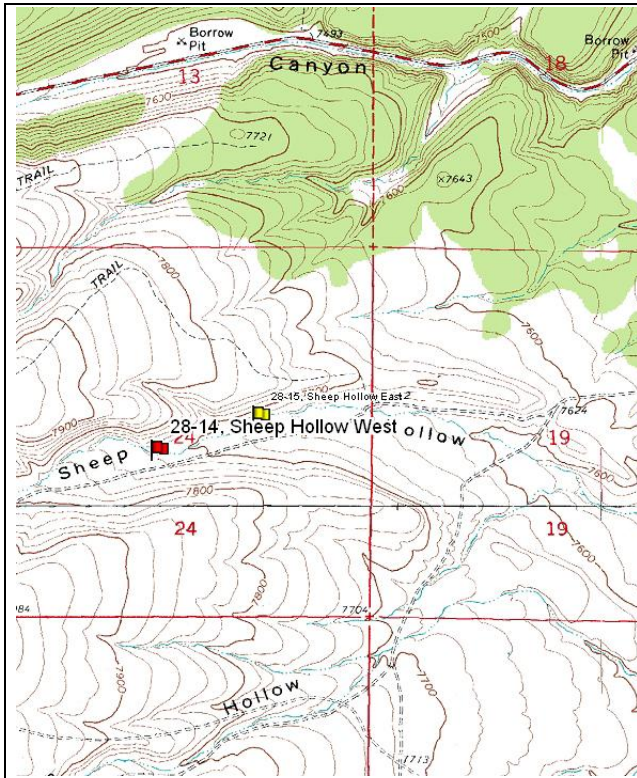
BROWSE CHARACTERISTICS--

Management unit 28, Study no: 11

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	80/71	
08	0	0	0	-	-	0	0	0	55/53	
13	0	0	0	-	-	0	0	0	40/65	
<i>Artemisia tridentata vaseyana</i>										
92	3400	6	44	51	20	44	16	28	-/-	
98	3120	4	71	25	3480	31	0	5	23/39	
03	2520	2	41	57	-	37	46	11	24/38	
08	2220	3	33	64	3000	38	30	39	21/34	
13	2840	35	37	27	360	21	42	19	27/37	
<i>Chrysothamnus nauseosus hololeucus</i>										
92	0	0	0	0	-	0	0	0	-/-	
98	60	0	0	100	-	100	0	0	-/-	
03	0	0	0	0	-	0	0	0	-/-	
08	0	0	0	0	-	0	0	0	-/-	
13	0	0	0	0	-	0	0	0	-/-	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
92	0	0	0	-	-	0	0	0	-/-	
98	60	0	100	-	-	0	0	0	6/5	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Cowania mexicana stansburiana</i>										
92	0	0	0	-	-	0	0	0	-/-	
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	22/40	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
92	180	0	89	11	-	0	0	0	-/-	
98	160	38	63	0	-	0	0	0	8/9	
03	380	0	100	0	-	0	0	0	7/8	
08	140	14	71	14	-	0	0	14	7/8	
13	120	17	83	0	-	0	0	0	7/11	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Juniperus osteosperma</b>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Opuntia sp.</b>									
92	40	50	50	0	-	0	0	0	-/-
98	40	0	50	50	-	0	0	50	5/12
03	40	0	100	0	-	0	0	0	5/10
08	60	0	100	0	-	0	0	0	7/18
13	80	0	100	0	-	0	0	25	6/21
<b>Pediocactus simpsonii</b>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	4/4
13	0	0	0	-	-	0	0	0	-/-
<b>Purshia tridentata</b>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	8/27
03	0	0	0	-	-	0	0	0	22/37
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	26/47
<b>Yucca sp.</b>									
92	0	0	0	-	-	0	0	0	-/-
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	24/21
08	0	0	0	-	-	0	0	0	23/30
13	0	0	0	-	-	0	0	0	16/20

SHEEP HOLLOW WEST - TREND STUDY NO. 28-14



**Location Information**

USGS 7.5 min Map Info Panguitch; Township 35S, Range 6W, Section 24  
 GPS (0' Stake) NAD 83, UTM Zone 12, 369494 East 4179303 North

**Transect Information**

Browse Tag # (0' Stake) 500  
 Transect Bearing 246° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Belt 4: 1ft

**Directions to Site**

Travel south on SR 143 from the town of Panguitch to mile marker 47. Go 0.1 mile west of mile marker 47 and turn south onto a dirt road heading towards Sheep Hollow. Drive 1.7 miles to a fork. Stay right and continue 0.8 miles to a fence and cattleguard. Cross the cattleguard and go 0.3 miles to a witness post on the right side of the road. The 0-foot baseline stake is 14 paces from the witness post at 330 degrees magnetic. The 0-foot stake has browse tag #500 attached.

**Site Information**

Land Ownership BLM  
 Allotment Sagehen Hollow  
 Elevation 7,730ft (2,356m)  
 Aspect East  
 Slope 2%  
 Sample Dates 08/20/1998, 06/25/2003, 06/26/2008, 07/15/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 14

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Lop and Scatter	-	-	1996-1997	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Year-Long; Elk, Substantial Year-Long Calving; Pronghorn, Crucial Year-Long; Sage-Grouse, Habitat Winter Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 28, Study no: 14

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Black Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This site was established in 1998 to monitor important winter range on the east side of the unit. Much of the winter range on this part of unit 28 is being affected by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) encroachment. This site samples a wide drainage bottom which supports a dense population of black sagebrush (*Artemisia nova*) with a good bitterbrush component. The area is used by a variety of wildlife during most of the year, especially during the winter when deep snow pushes them to lower elevations.

**Site Potential**

1981-2010 Average Annual Precipitation 18 inches  
 NRCS Taxonomical soil Classification Fine, montmorillonitic Typic Argiborolls  
 NRCS Ecological Site Upland Clay (Black Sagebrush)  
 NRCS Ecological Site # R047XB301UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 14

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	40.7	27.4	31.8	6.3	0.3	2.2	18.4	131.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Since its establishment in 1998 this site has remained a stable black sagebrush community with various other shrub species which provide some cover. The herbaceous understory has been diverse and has consisted mainly of perennial native grasses (Table - Browse Trends; Table Herbaceous Trends). Without disturbance, the site will likely remain in a stable black sagebrush community.



## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 28, study no: 14

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	24.3	6.1	4.6	30.0	0.0	9.6	0.0	<b>74.5</b>	Good
2003	27.1	4.6	2.4	16.8	0.0	2.9	0.0	<b>53.7</b>	Fair
2008	24.7	3.4	2.9	30.0	0.0	6.0	0.0	<b>67.0</b>	Fair-Good
2013	29.8	12.7	3.3	30.0	0.0	2.2	0.0	<b>77.9</b>	Good

## HERBACEOUS TRENDS--

Management unit 28, Study no: 14

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron intermedium	-	8	-	-	-	.08	-	-
G	Agropyron smithii	3	4	2	2	.00	.03	.03	.00
G	Agropyron spicatum	6	-	-	4	.03	-	-	.15
G	Agropyron trachycaulum	4	3	-	-	.03	.03	-	-
G	Bouteloua gracilis	4	7	6	7	.03	.06	.03	.03
G	Bromus inermis	5	-	-	5	.03	-	-	.06
G	Bromus tectorum (a)	-	4	-	2	-	.01	-	.00
G	Carex sp.	b21	a-	c53	b22	.63	-	1.11	.21
G	Koeleria cristata	ab27	b64	ab48	a16	.44	1.48	.74	.13
G	Oryzopsis hymenoides	a2	a4	a5	b14	.03	.15	.03	.36
G	Poa fendleriana	b232	ab186	a163	c285	8.61	4.21	6.92	15.10
G	Sitanion hystrix	b74	b71	a24	a14	.97	.90	.18	.17
G	Stipa columbiana	8	-	6	5	.19	-	.01	.01
G	Stipa comata	12	13	8	20	.10	.35	.08	.34
G	Stipa lettermani	b183	a102	b186	a68	4.86	1.08	5.90	1.60
Total for Annual Grasses		0	4	0	2	0	0.01	0	0.00
Total for Perennial Grasses		581	462	501	462	15.97	8.39	15.06	18.19
Total for Grasses		581	466	501	464	15.97	8.40	15.06	18.19
F	Antennaria rosea	-	-	1	-	-	-	.00	-
F	Antennaria sp.	b16	ab9	a-	ab7	.36	.01	-	.09
F	Arabis sp.	1	-	2	6	.01	-	.03	.02
F	Astragalus convallarius	b8	a-	b20	a-	.21	-	.51	-
F	Astragalus sp.	3	-	-	-	.00	-	-	-
F	Calochortus nuttallii	a-	a-	b22	a-	-	-	.12	-
F	Castilleja linariaefolia	b49	a2	b37	a9	1.24	.03	.61	.12
F	Chenopodium leptophyllum(a)	a-	b15	a3	a-	-	.09	.00	-
F	Cirsium sp.	-	-	1	-	-	-	.00	-
F	Erigeron eatonii	b63	a5	a28	a11	.59	.03	.08	.07
F	Erigeron flagellaris	9	-	-	-	.07	-	-	-
F	Erigeron pumilus	b25	a-	ab3	ab6	.04	-	.01	.07

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Eriogonum racemosum	ab55	ab54	b70	a36	.45	.50	.59	.27
F	Eriogonum umbellatum	b46	ab33	ab30	a18	.79	.61	.44	.11
F	Gayophytum ramosissimum(a)	a-	b87	a-	a-	-	.43	-	-
F	Hymenoxys richardsonii	1	-	2	5	.03	-	.03	.03
F	Lappula occidentalis (a)	-	-	1	5	-	-	.00	.01
F	Linum lewisii	c46	b14	ab9	a-	.25	.05	.08	-
F	Lomatium sp.	-	-	5	-	-	-	.02	-
F	Lotus utahensis	b35	a-	a3	a-	.42	-	.04	-
F	Lupinus kingii (a)	ab4	a-	b11	a-	.03	-	.03	-
F	Lychnis drummondii	7	-	-	-	.01	-	-	-
F	Machaeranthera canescens	5	-	4	10	.06	-	.01	.18
F	Microsteris gracilis (a)	-	-	3	-	-	-	.00	-
F	Penstemon caespitosus	3	-	-	1	.03	-	-	.00
F	Penstemon sp.	3	4	1	-	.00	.01	.03	-
F	Phlox longifolia	b58	b56	b74	a13	.17	.19	.24	.08
F	Polygonum douglasii (a)	a11	a5	b21	a-	.02	.01	.05	-
F	Senecio multilobatus	a-	a-	b16	ab5	-	-	.11	.01
F	Trifolium sp.	-	-	5	-	-	-	.01	-
Total for Annual Forbs		15	107	39	5	0.05	0.53	0.09	0.01
Total for Perennial Forbs		433	177	333	127	4.79	1.45	3.00	1.08
Total for Forbs		448	284	372	132	4.85	1.99	3.10	1.09

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

#### BROWSE TRENDS--

Management unit 28, Study no: 14

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia nova	13.73	17.06	15.33	17.49	16.66	27.93	35.01
B	Artemisia tridentata tridentata	-	.36	-	-	-	-	-
B	Chrysothamnus depressus	.40	.12	.22	.23	.11	.31	.15
B	Chrysothamnus viscidiflorus	-	-	.54	-	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	2.79	4.17	3.10	3.38	1.86	4.40	5.40
B	Gutierrezia sarothrae	.21	.31	.01	-	.05	-	-
B	Opuntia sp.	-	-	.00	-	-	-	-
B	Purshia tridentata	4.41	3.42	3.51	5.07	3.44	5.36	15.93
B	Tetradymia canescens	-	-	.06	-	-	-	-
Total for Browse		21.54	25.46	22.79	26.19	22.12	38	56.49

BASIC COVER--

Management unit 28, Study no: 14

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	51.18	35.07	43.72	43.86
Rock	5.72	5.79	5.91	5.81
Pavement	6.77	3.70	7.75	3.07
Litter	39.84	34.54	32.64	32.98
Cryptogams	3.50	1.47	.97	.89
Bare Ground	18.07	35.31	20.43	27.47

PELLET GROUP DATA--

Management unit 28, Study no: 14

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	6	2	70	10	-	-	-	-
Elk	5	2	1	1	7 (17)	1 (2)	1 (2)	1 (2)
Deer	10	11	4	5	15 (37)	32 (79)	16 (40)	5 (13)
Cattle	1	3	5	-	12 (30)	7 (18)	4 (11)	-
Pronghorn	1	-	-	-	-	-	-	-

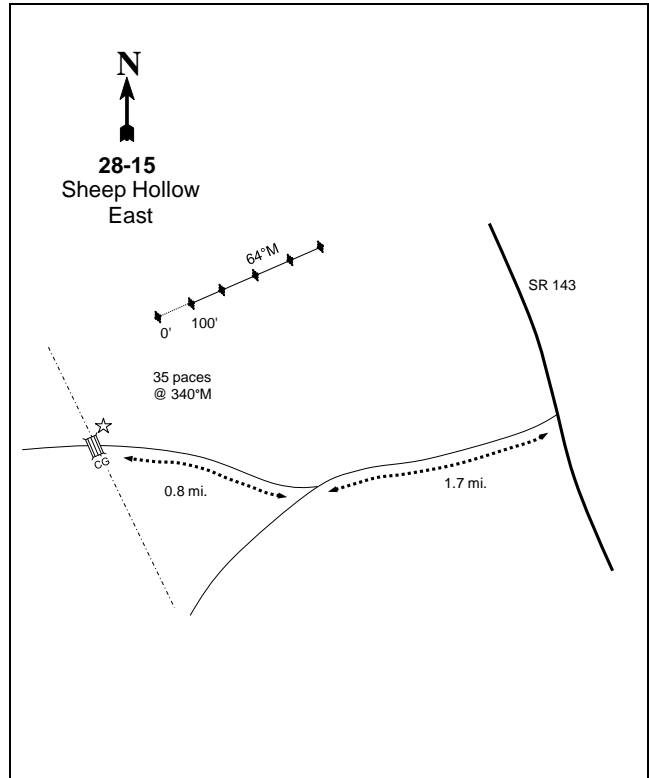
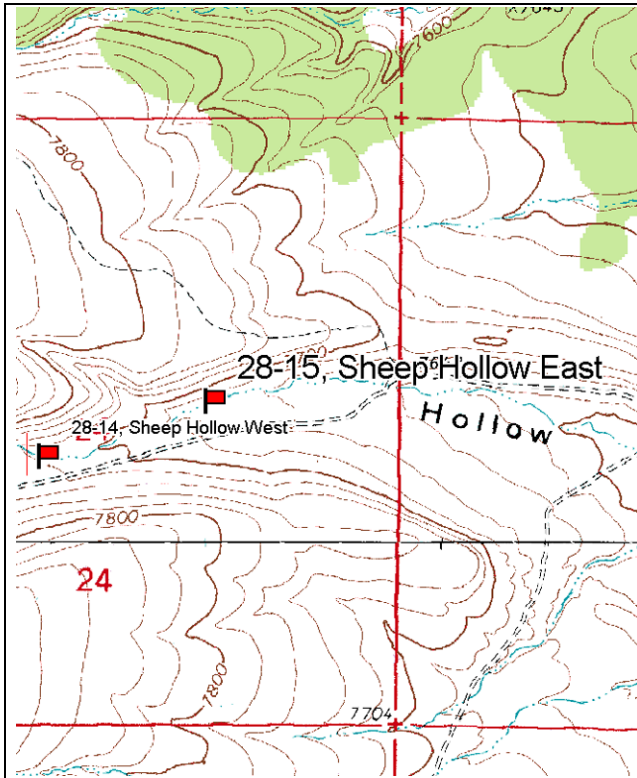
BROWSE CHARACTERISTICS--

Management unit 28, Study no: 14

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	11/12
13	0	0	0	-	-	0	0	0	-/-
<b>Artemisia nova</b>									
98	8560	7	55	39	380	43	13	3	16/22
03	8160	5	61	34	-	25	1	14	15/20
08	9440	5	54	41	540	27	13	12	14/23
13	7760	4	87	9	300	37	4	6	14/25
<b>Artemisia tridentata tridentata</b>									
98	60	33	67	0	-	0	33	0	-/-
03	560	0	57	43	-	21	0	25	20/26
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-
<b>Artemisia tridentata wyomingensis</b>									
98	0	0	0	0	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	-/-
08	40	0	0	100	-	0	100	100	-/-
13	0	0	0	0	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus depressus</b>										
98	240	17	83	0	20	0	0	0	7/10	
03	340	6	82	12	-	71	12	0	5/9	
08	380	5	79	16	-	21	47	0	5/8	
13	360	17	83	0	-	22	6	6	5/10	
<b>Chrysothamnus parryi</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	100	0	-	-	0	0	0	7/9	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
98	2740	12	88	0	-	0	0	0	8/12	
03	4120	5	93	2	-	0	0	.48	7/12	
08	3960	4	78	18	120	30	8	.50	7/13	
13	3360	8	91	1	20	13	0	.59	7/15	
<b>Gutierrezia sarothrae</b>										
98	80	0	100	0	-	0	0	0	6/8	
03	260	0	100	0	-	0	0	0	7/6	
08	100	20	60	20	60	0	0	0	5/4	
13	120	50	50	0	-	0	0	0	9/8	
<b>Opuntia sp.</b>										
98	20	0	100	0	-	0	0	0	7/12	
03	40	0	100	0	-	0	0	0	6/12	
08	40	0	50	50	-	0	0	0	6/11	
13	20	0	100	0	-	0	0	0	4/9	
<b>Purshia tridentata</b>										
98	540	15	81	4	-	59	19	0	23/36	
03	480	4	58	38	-	71	29	21	30/45	
08	460	9	61	30	20	48	35	4	27/47	
13	660	15	82	3	40	3	0	3	36/59	
<b>Tetradymia canescens</b>										
98	0	0	0	0	-	0	0	0	-/-	
03	0	0	0	0	-	0	0	0	-/-	
08	40	0	50	50	-	100	0	0	-/-	
13	0	0	0	0	-	0	0	0	-/-	

SHEEP HOLLOW EAST - TREND STUDY NO. 28-15



**Location Information**

USGS 7.5 min Map Info Panguitch; Township 35S, Range 6W, Section 24  
 GPS (0' Stake) NAD 83, UTM Zone 12, 369941 East 4179446 North

**Transect Information**

Browse Tag # (0' Stake) 496  
 Transect Bearing 64° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Belt 5: 1ft

**Directions to Site**

Traveling south on SR 143 from the town of Panguitch to mile marker 47. Go 0.1 mile west of mile marker 47 and turn south onto a dirt road heading towards Sheep Hollow. Drive 1.7 miles to a fork. Stay right and continue 0.8 miles to a fence and cattleguard. The witness post is on the right side of the road just before the cattleguard. From the cattleguard, the 0-foot stake is 35 paces away at 340 degrees magnetic and is marked with browse tag #496.

**Site Information**

Land Ownership BLM  
 Allotment South Canyon  
 Elevation 7,700ft (2,347m)  
 Aspect East  
 Slope 2%  
 Sample Dates 08/20/1998, 06/25/2003, 06/26/2008, 07/15/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 15

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Lop and Scatter	-	-	Prior to 1998	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Year-Long; Elk, Substantial Year-Long Calving; Pronghorn, Crucial Year-Long; Sage-Grouse, Habitat Winter Nesting and Brood-Rearing

**VEGETATION HISTORY--**

Management unit 28, Study no: 15

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2008	Black Sagebrush	Phase I
2013	Black Sagebrush/Bitterbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This study was established in conjunction with study 28-14, which lies a half mile to the west of this site and across the fence in a different grazing regime. This site receives heavier grazing pressure than the previous study. Deer presence was high in 1998 and 2008 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Fine, montmorillonitic Typic Argiborolls  
 NRCS Ecological Site Upland Clay (Black Sagebrush)  
 NRCS Ecological Site # R047XB301UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 15

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	62.7	21.4	15.8	7.1	0.3	2.6	24.8	262.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

Since its establishment in 1998, this site has remained a stable black sagebrush community with a strong component of bitterbrush (*Purshia tridentata*) and various other shrub species that provided limited cover. The herbaceous understory has been diverse and has consisted mainly of perennial native grasses. There is some pinyon pine (*Pinus edulis*) encroachment occurring on this site though it is still in the early stages of phase I. Without disturbance, the site will likely remain in a stable black sagebrush community.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 28, study no: 15

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	7.9	2.3	15.5	0.0	5.8	0.0	<b>61.4</b>	Fair
2003	30.0	7.8	2.2	4.6	0.0	2.4	0.0	<b>47.0</b>	Poor
2008	30.0	1.8	5.8	14.2	0.0	6.9	0.0	<b>58.7</b>	Fair
2013	30.0	11.2	3.2	21.8	0.0	3.5	0.0	<b>69.6</b>	Good

## HERBACEOUS TRENDS--

Management unit 28, Study no: 15

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	-	-	-	2	-	-	-	.03
G	Agropyron intermedium	a3	a-	a-	b16	.01	-	-	.10
G	Agropyron smithii	a2	a8	b49	a10	.01	.01	.15	.10
G	Bouteloua gracilis	175	137	154	161	2.77	1.15	3.61	5.46
G	Bromus carinatus	b23	a-	ab9	a4	.12	-	.09	.03
G	Bromus tectorum (a)	7	9	19	9	.02	.01	.04	.02
G	Carex sp.	a3	a-	b26	a4	.06	.00	.16	.01
G	Koeleria cristata	3	3	3	6	.03	.15	.06	.12
G	Oryzopsis hymenoides	a4	a-	a-	b36	.18	-	.00	.70
G	Poa fendleriana	40	40	13	35	.76	.23	.14	.88
G	Sitanion hystrix	b116	a60	ab74	a39	1.58	.46	1.26	.52
G	Stipa columbiana	a9	a7	a-	b29	.21	.04	-	.30
G	Stipa comata	a16	a8	a33	b68	.38	.07	.68	1.68
G	Stipa lettermani	b62	a19	b64	a19	1.63	.18	.96	.93
Total for Annual Grasses		7	9	19	9	0.02	0.01	0.04	0.02
Total for Perennial Grasses		456	282	425	429	7.76	2.31	7.12	10.88
Total for Grasses		463	291	444	438	7.78	2.32	7.17	10.91
F	Alyssum alyssoides (a)	6	-	-	-	.01	-	-	-
F	Arabis sp.	b11	a-	c38	c72	.05	-	.33	.25
F	Aster sp.	-	-	-	3	-	-	-	.00
F	Astragalus convallarius	b11	b13	ab3	a-	.22	.11	.09	-
F	Astragalus sp.	9	13	4	6	.02	.02	.03	.01
F	Calochortus nuttallii	-	5	6	-	-	.01	.04	-
F	Castilleja linariaefolia	b17	b10	b12	a-	.16	.04	.39	-
F	Chaenactis douglasii	7	1	-	-	.02	.03	-	-
F	Chenopodium leptophyllum(a)	a-	a3	b10	a-	-	.00	.02	-
F	Cirsium sp.	-	-	1	-	-	-	.00	-
F	Cryptantha sp.	ab6	a-	ab8	b16	.04	.00	.04	.05
F	Descurainia pinnata (a)	2	-	-	1	.01	-	-	.00
F	Erigeron divergens	b20	a-	a-	a7	.15	-	-	.01

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Erigeron eatonii</i>	ab7	a-	ab6	b13	.01	-	.07	.05
F	<i>Erigeron flagellaris</i>	8	-	-	-	.38	-	-	-
F	<i>Erigeron pumilus</i>	ab25	a6	a15	b31	.11	.04	.37	.45
F	<i>Eriogonum racemosum</i>	23	24	25	13	.21	.17	.37	.14
F	<i>Eriogonum umbellatum</i>	ab31	ab28	b43	a25	.49	.30	.41	.19
F	<i>Euphorbia robusta</i>	5	4	4	2	.09	.06	.15	.03
F	<i>Gayophytum ramosissimum(a)</i>	a-	b108	b86	a3	-	.60	.22	.00
F	<i>Gilia sp. (a)</i>	4	-	-	-	.01	-	-	-
F	<i>Leucelene ericoides</i>	-	2	4	9	-	.03	.01	.04
F	<i>Linum lewisii</i>	b9	ab3	ab2	a-	.05	.01	.00	-
F	<i>Lotus utahensis</i>	4	-	3	-	.06	-	.01	-
F	<i>Lupinus argenteus</i>	b12	ab2	b10	a-	.25	.07	.48	-
F	<i>Lupinus kingii (a)</i>	-	-	11	-	-	-	.01	-
F	<i>Lychnis drummondii</i>	1	4	-	-	.00	.01	-	-
F	<i>Lygodesmia spinosa</i>	ab23	b29	ab28	a12	.18	.14	.28	.15
F	<i>Machaeranthera canescens</i>	b28	a5	a2	a8	.15	.09	.03	.01
F	<i>Oenothera pallida</i>	ab17	a3	a3	b21	.08	.00	.03	.17
F	<i>Penstemon sp.</i>	-	-	6	-	-	-	.01	-
F	<i>Phlox longifolia</i>	ab23	ab13	b35	a7	.08	.03	.19	.04
F	<i>Polygonum douglasii (a)</i>	a-	a-	b21	a2	-	-	.04	.00
F	<i>Senecio multilobatus</i>	ab1	a-	ab10	b10	.03	-	.05	.10
F	<i>Trifolium sp.</i>	2	-	3	1	.00	-	.00	.00
Total for Annual Forbs		12	111	128	6	0.03	0.61	0.31	0.01
Total for Perennial Forbs		300	165	271	256	2.89	1.19	3.45	1.73
Total for Forbs		312	276	399	262	2.92	1.80	3.77	1.75

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

#### BROWSE TRENDS--

Management unit 28, Study no: 15

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia nova</i>	20.73	21.42	21.17	19.42	21.60	30.10	35.03
B	<i>Artemisia tridentata tridentata</i>	.77	6.57	.53	1.75	10.26	.68	2.76
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	.24	.59	.22	.77	.21	.76	.96
B	<i>Gutierrezia sarothrae</i>	.03	-	-	-	.26	-	.01
B	<i>Mahonia repens</i>	.01	.06	.04	.03	.05	-	-
B	<i>Pinus edulis</i>	.03	.30	.15	-	.10	.36	.21
B	<i>Pinus monophylla</i>	-	-	-	.00	-	-	-
B	<i>Purshia tridentata</i>	4.14	5.08	3.92	6.59	7.68	6.85	17.71
Total for Browse		25.96	34.04	26.04	28.58	40.16	38.75	56.68



BASIC COVER--

Management unit 28, Study no: 15

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	44.70	37.75	36.70	40.67
Rock	5.99	8.08	7.09	7.66
Pavement	6.91	5.81	5.66	5.66
Litter	45.79	37.56	39.92	45.88
Cryptogams	.04	.18	.07	.72
Bare Ground	16.03	30.54	23.18	14.57

PELLET GROUP DATA--

Management unit 28, Study no: 15

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	3	12	58	14	-	-	-	-
Elk	5	1	-	-	15 (37)	-	4 (10)	-
Deer	26	27	23	26	49 (121)	33 (83)	42 (103)	12 (30)
Cattle	6	3	6	4	-	31 (77)	32 (79)	-
Pronghorn	1	-	-	-	-	-	-	-

BROWSE CHARACTERISTICS--

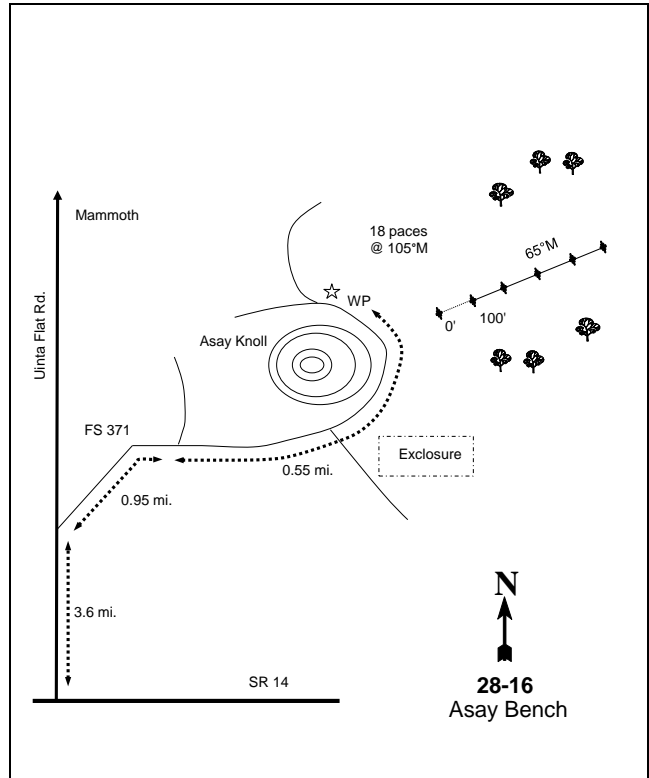
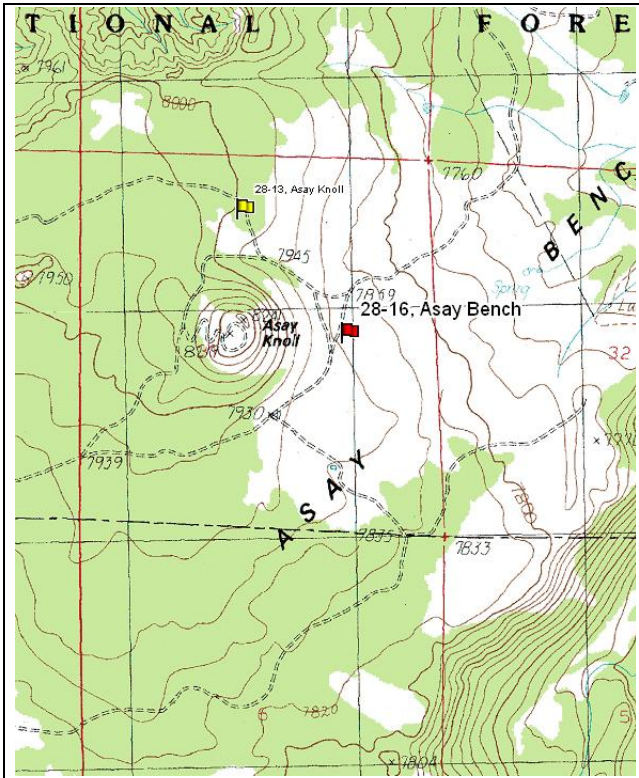
Management unit 28, Study no: 15

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Artemisia nova</b>									
98	<b>7840</b>	4	68	28	220	35	7	5	18/28
03	<b>7640</b>	6	69	25	-	17	1	11	13/19
08	<b>9740</b>	14	44	42	2720	26	7	10	16/27
13	<b>6300</b>	8	77	16	100	24	9	16	14/26
<b>Artemisia tridentata tridentata</b>									
98	<b>260</b>	8	69	23	-	31	0	0	40/48
03	<b>1400</b>	0	71	29	-	6	0	7	32/37
08	<b>60</b>	0	33	67	-	100	0	0	41/50
13	<b>260</b>	0	100	0	20	31	15	8	31/45
<b>Ceanothus fendleri</b>									
98	<b>20</b>	100	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	28/29
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus nauseosus</b>									
98	<b>0</b>	0	0	-	-	0	0	0	26/24
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	16/17
13	<b>0</b>	0	0	-	-	0	0	0	48/53

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Chrysothamnus parryi</b>									
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	8/10
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
98	260	8	85	8	-	8	0	0	8/15
03	300	0	100	0	-	0	0	0	6/10
08	300	0	87	13	-	13	0	0	9/15
13	500	20	80	0	-	0	0	0	11/20
<b>Gutierrezia sarothrae</b>									
98	20	0	100	0	-	0	0	0	7/18
03	40	0	100	0	-	0	0	0	8/16
08	60	0	33	67	-	0	0	67	8/6
13	20	100	0	0	-	0	0	0	6/12
<b>Juniperus osteosperma</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	20	100	0	-	-	0	0	0	-/-
13	40	100	0	-	-	0	0	0	-/-
<b>Mahonia repens</b>									
98	880	9	91	-	-	0	0	0	-/-
03	520	8	92	-	-	0	0	0	2/3
08	780	3	97	-	-	0	0	0	3/4
13	340	0	100	-	-	0	0	0	3/5
<b>Opuntia sp.</b>									
98	60	0	100	0	-	0	0	0	8/6
03	40	0	100	0	-	0	0	0	6/9
08	40	0	50	50	-	0	0	0	6/7
13	60	0	100	0	-	0	0	0	6/12
<b>Pediocactus simpsonii</b>									
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	2/3
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	3/4
<b>Pinus edulis</b>									
98	20	100	0	-	-	0	0	0	-/-
03	40	100	0	-	-	0	0	0	-/-
08	20	100	0	-	-	0	0	0	-/-
13	20	100	0	-	20	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Purshia tridentata</i>										
98	<b>600</b>	7	90	3	-	53	33	0	31/50	
03	<b>600</b>	3	83	13	-	3	97	0	31/51	
08	<b>620</b>	0	48	52	20	48	45	3	26/50	
13	<b>660</b>	3	91	6	20	30	3	9	41/70	
<i>Rhus trilobata</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	14/23	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Tetradymia canescens</i>										
98	<b>20</b>	0	100	-	-	0	0	0	12/18	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>40</b>	0	100	-	-	0	0	0	11/22	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

ASAY BENCH - TREND STUDY NO. 28-16



**Location Information**

USGS 7.5 min Map Info Asay Bench; Township 37S, Range 6W, Section 31  
 GPS (0' Stake) NAD 83, UTM Zone 12, 361875 East 4157011 North

**Transect Information**

Browse Tag # (0' Stake) 165  
 Transect Bearing 65° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Belt 3 and 5: 1ft

**Directions to Site**

Start at the junction of Highway 14 and Uinta Flat Road, which is just east of mile post 33 on Hwy 14. Drive north on Uinta Flat Road for 3.6 miles to a fork going east (F.S. Rd. 371). Drive east for 1.0 miles crossing over a cattleguard and coming to a fork on the left (north). Continue straight (right) for 0.55 miles to a fork (an exclosure should be passed on the right before the fork). The witness post is on the east (right) side of the road just past the right fork. From the witness post the 0-foot stake is 18 paces at 105°magnetic. The 0-foot stake is marked by browse tag #165.

**Site Information**

Land Ownership USFS  
 Allotment Asay Bench  
 Elevation 7,880ft (2,402m)  
 Aspect Northeast  
 Slope 4%  
 Sample Dates 07/16/2003, 07/01/2008, 07/30/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer; Elk, Substantial Summer Calving

## VEGETATION HISTORY--

Management unit 28, Study no: 16

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2003-2013	Mountain Big Sagebrush/Bitterbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This study was established in 2003 to replace trend study 28-9 which sampled marginal big game transitional range. Deer presence was high 2008 and 2013 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 21 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed Pachic Argiborolls  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush-Indian Ricegrass\)](#)  
 NRCS Ecological Site # R047XB308UT

## SOIL ANALYSIS DATA--

Management unit 28, Study no: 16

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	36.6	39.2	24.2	6.2	0.6	2.9	28.4	572.8	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since its establishment in 2003, the site has remained a stable community of mixed mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush (*Purshia tridentata*) with a diverse component of other shrub species present which have provided limited cover. Native perennial grass species make up the majority of the herbaceous understory. Forbs have been diverse but cover has been limited (Table Browse Trends; Table - Herbaceous Trends). Without disturbance and tree encroachment, the site will likely remain in a stable sagebrush and bitterbrush community.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 28, study no: 16

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2003	30.0	1.1	3.3	26.2	0.0	1.0	0.0	<b>61.6</b>	Fair
2008	30.0	-1.0	3.5	30.0	0.0	2.5	0.0	<b>65.0</b>	Fair-Good
2013	30.0	13.7	5.6	30.0	0.0	2.8	0.0	<b>82.1</b>	Excellent

HERBACEOUS TRENDS--  
Management unit 28, Study no: 16

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Agropyron dasystachyum	a3	a17	b100	.06	.20	1.80
G	Agropyron intermedium	a3	b10	a-	.03	.33	-
G	Bouteloua gracilis	1	6	9	.00	.16	.63
G	Bromus inermis	-	6	-	-	.03	-
G	Carex sp.	3	8	7	.06	.06	.18
G	Koeleria cristata	109	73	76	1.50	.69	1.36
G	Poa fendleriana	a249	b339	b325	9.32	17.07	15.45
G	Poa pratensis	b11	a-	a-	.60	-	-
G	Poa secunda	b29	a3	a-	.60	.00	-
G	Sitanion hystrix	3	-	-	.01	-	-
G	Stipa comata	b24	b45	a1	.34	.80	.00
G	Stipa lettermani	a41	b94	a44	.56	2.05	.88
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		476	601	562	13.11	21.43	20.32
Total for Grasses		476	601	562	13.11	21.43	20.32
F	Agoseris glauca	b25	c42	a-	.10	.21	-
F	Antennaria sp.	7	7	16	.04	.19	.97
F	Arabis sp.	13	4	12	.02	.01	.06
F	Artemesia carruthii	a15	ab24	b36	.11	.14	.14
F	Astragalus sp.	-	11	-	-	.09	-
F	Calochortus nuttallii	b18	c99	a-	.03	.39	-
F	Collinsia parviflora (a)	b167	b167	a-	.72	.61	-
F	Comandra pallida	3	-	-	.03	-	-
F	Crepis acuminata	3	-	-	.01	-	-
F	Delphinium nuttallianum	2	4	-	.00	.01	-
F	Erigeron flagellaris	1	-	-	.00	-	-
F	Erigeron pumilus	35	16	15	.10	.08	.13
F	Eriogonum racemosum	6	8	13	.03	.09	.09
F	Eriogonum umbellatum	2	-	-	.00	-	-
F	Gayophytum ramosissimum(a)	b85	a2	a-	.24	.01	-
F	Lactuca serriola (a)	2	-	-	.00	-	-

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
F	<i>Microsteris gracilis</i> (a)	c166	b60	a-	.84	.15	-
F	<i>Plantago patagonica</i> (a)	a-	b32	a-	-	.11	-
F	<i>Polygonum douglasii</i> (a)	5	6	-	.01	.04	-
Total for Annual Forbs		425	267	0	1.82	0.93	0
Total for Perennial Forbs		130	215	92	0.51	1.23	1.40
Total for Forbs		555	482	92	2.34	2.16	1.40

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

#### BROWSE TRENDS--

Management unit 28, Study no: 16

Type	Species	Quadrat Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	<i>Artemisia nova</i>	-	-	2.07	-	-	3.25
B	<i>Artemisia tridentata vaseyana</i>	13.83	11.36	8.62	17.11	20.88	15.05
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	3.49	3.72	3.90	1.93	4.68	3.18
B	<i>Gutierrezia sarothrae</i>	1.33	-	-	.66	-	-
B	<i>Purshia tridentata</i>	14.19	15.21	17.27	10.13	18.83	29.21
B	<i>Rosa woodsii</i>	.03	.03	-	.03	-	-
B	<i>Symphoricarpos oreophilus</i>	1.86	.45	.56	1.40	.66	.78
B	<i>Tetradymia canescens</i>	.03	.00	.00	-	-	-
Total for Browse		34.78	30.79	32.43	31.26	45.05	51.47

#### BASIC COVER--

Management unit 28, Study no: 16

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	49.34	59.40	57.68
Rock	5.65	2.99	3.63
Pavement	1.38	4.62	1.09
Litter	40.23	36.27	51.14
Cryptogams	.15	.01	.00
Bare Ground	23.70	13.17	16.53

#### PELLET GROUP DATA--

Management unit 28, Study no: 16

Type	Quadrat Frequency		
	'03	'08	'13
Rabbit	2	8	1
Elk	12	18	16
Deer	5	16	11
Cattle	5	8	-

Days use per acre (ha)		
'03	'08	'13
-	-	-
20 (50)	13 (33)	37 (91)
19 (50)	61 (150)	46 (112)
7 (18)	12 (29)	11 (27)

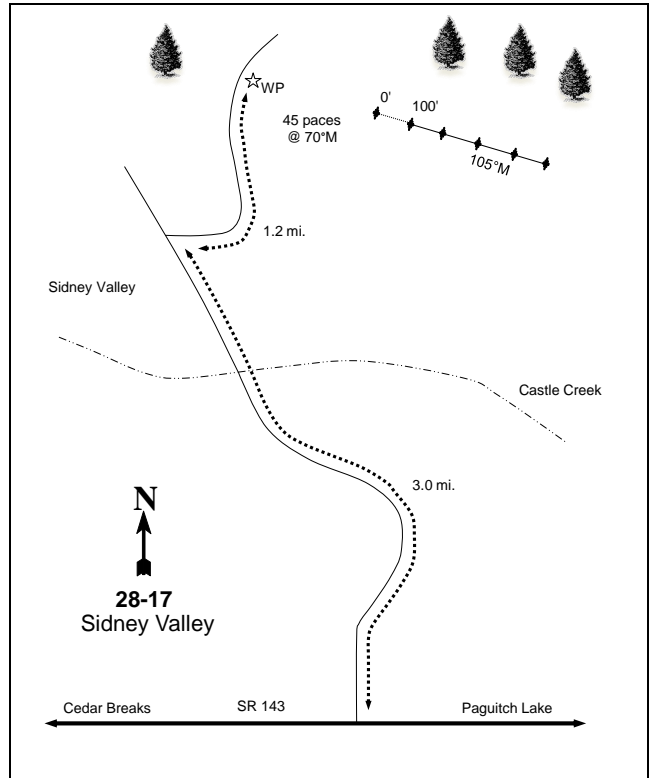
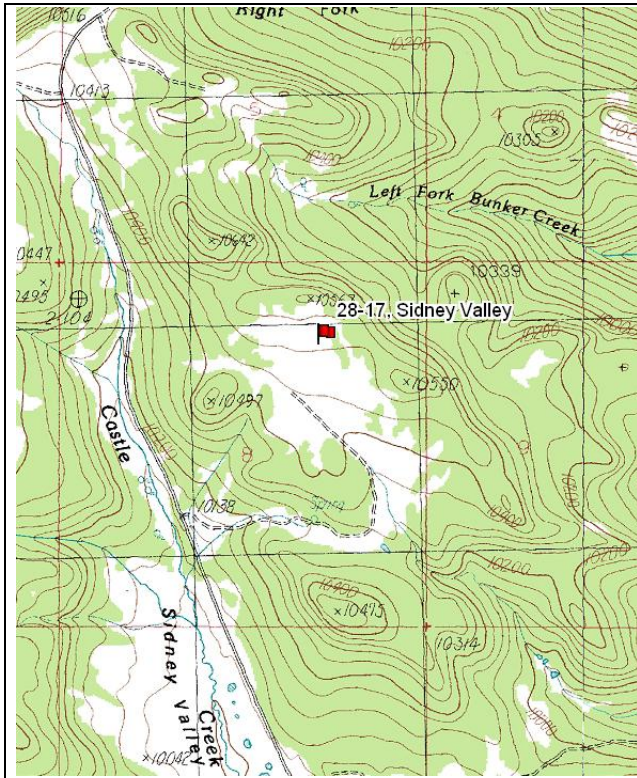
BROWSE CHARACTERISTICS--  
Management unit 28, Study no: 16

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>Amelanchier utahensis</i>									
03	40	0	0	100	-	0	0	50	-/-
08	20	0	0	100	-	0	0	100	18/20
13	20	0	100	0	-	0	100	0	21/23
<i>Artemisia nova</i>									
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	840	0	93	7	-	43	0	2	14/28
<i>Artemisia tridentata vaseyana</i>									
03	6760	9	77	14	-	33	2	3	18/19
08	6440	11	25	65	100	27	4	19	18/24
13	4020	14	76	10	240	51	16	13	19/26
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
03	5080	2	94	4	-	1	0	2	7/9
08	5320	7	74	19	40	23	.75	2	6/12
13	3800	16	84	0	-	21	3	1	8/12
<i>Gutierrezia sarothrae</i>									
03	2640	0	100	-	-	0	0	0	6/7
08	0	0	0	-	-	0	0	0	-/-
13	40	0	100	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
03	0	0	0	-	-	0	0	0	3/9
08	60	0	100	-	-	0	0	33	5/11
13	60	0	100	-	-	33	0	67	4/10
<i>Purshia tridentata</i>									
03	2120	4	18	78	-	20	77	32	19/31
08	2380	4	51	45	20	62	5	12	23/43
13	2780	11	88	1	220	53	26	12	26/45
<i>Ribes cereum inebrians</i>									
03	0	0	0	-	-	0	0	0	41/54
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	29/66
<i>Rosa woodsii</i>									
03	80	100	0	-	-	0	0	0	5/4
08	40	100	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Symphoricarpos oreophilus</i>										
03	<b>200</b>	10	80	10	-	0	0	0	17/25	
08	<b>180</b>	0	44	56	20	11	11	11	18/27	
13	<b>220</b>	27	73	0	-	27	0	9	16/22	
<i>Tetradymia canescens</i>										
03	<b>20</b>	0	100	0	-	0	0	0	9/13	
08	<b>20</b>	0	0	100	-	100	0	0	-/-	
13	<b>20</b>	0	100	0	-	100	0	100	-/-	

SIDNEY VALLEY - TREND STUDY NO. 28-17



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Brian Head; Township 36S, Range 8W, Section 8  
NAD 83, UTM Zone 12, 344406 East 4174160 North

**Transect Information**

Browse Tag # (0' Stake)

164

Transect Bearing

105° magnetic

Length

500ft

Belt Placement

Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)

Belt Marker Placement

Standard

**Directions to Site**

Start at the junction of Highway 143 and the Sidney Valley Road. This junction is between Cedar Breaks and Panguitch Lake. Drive north on Sidney Valley Road for 3.0 miles to a fork on the right (east) side of the road (there is no avoiding it), Castle Creek will be crossed). Take the right fork for 1.2 miles to the witness post on the right (east) side of the road. The 0-foot stake is 54 paces at 70° magnetic from the witness post. The 0-foot stake is marked with browse tag #164.

**Site Information**

Land Ownership USFS  
 Allotment Warren Bunker-Castle Valley  
 Elevation 10,510ft (3,203m)  
 Aspect South  
 Slope 5-10%  
 Sample Dates 07/16/2003, 07/03/2008, 07/30/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Summer; Elk, Crucial Summer, Calving

## VEGETATION HISTORY--

Management unit 28, Study no: 17

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>
2003-2013	Dry Meadow

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

**Site Notes**

This study was established in 2003 to monitor elk use in a dry alpine meadow, which had shown increased use in years prior to the study establishment. Elk presence has been high in all study years (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 36 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Subalpine Loam (Geranium)  
 NRCS Ecological Site # R047XB614UT

## SOIL ANALYSIS DATA--

Management unit 28, Study no: 17

<i>Texture</i>	<i>Sand (%)</i>	<i>Silt (%)</i>	<i>Clay (%)</i>	<i>pH</i>	<i>ds/m</i>	<i>OM (%)</i>	<i>PPM P</i>	<i>PPM K</i>	<i>Year Sampled</i>
Loam	44.6	37.2	18.2	5.6	0.5	3.3	25.4	752.0	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 2003, this site has remained as a stable dry meadow community. This site has a diverse mixture of perennial native grasses with a few introduced grasses low in cover. Forb diversity and cover have also been very high with a mixture of perennial and annual forbs (Table - Herbaceous Trends). There were no shrubs sampled on this site.

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 28, Study no: 17

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Agropyron trachycaulum	a54	a91	b128	.75	1.03	4.40
G	Bromus inermis	-	-	1	-	-	.01
G	Carex sp.	13	21	18	.22	.32	.60
G	Festuca ovina	ab11	a9	b39	.15	.26	1.56
G	Koeleria cristata	-	-	3	-	-	.15
G	Muhlenbergia montana	100	107	82	6.29	4.30	3.03
G	Poa glauca	b10	a-	ab5	.36	-	.06
G	Poa pratensis	-	2	7	-	.01	.09
G	Sitanion hystrix	a5	a7	b24	.10	.05	.71
G	Stipa columbiana	b272	ab300	a200	15.90	12.12	10.30
G	Stipa lettermani	a167	b224	ab199	4.22	4.48	6.36
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		632	761	706	28.01	22.60	27.30
Total for Grasses		632	761	706	28.01	22.60	27.30
F	Achillea millefolium	a218	b317	b358	3.67	9.08	17.52
F	Agoseris aurantiaca	a6	b26	a-	.07	.16	.00
F	Androsace septentrionalis (a)	a1	b153	c303	.00	.86	2.99
F	Antennaria sp.	-	-	2	-	-	.03
F	Arabis sp.	a6	c160	b82	.01	1.00	.42
F	Aster chilensis	a16	a6	b42	.19	.18	1.29
F	Chenopodium fremontii (a)	a-	b11	b23	-	.03	.11
F	Collomia linearis (a)	-	-	2	-	-	.00
F	Erigeron sp.	a19	b96	a7	.21	.85	.21
F	Fritillaria atropurpurea	-	4	-	-	.06	-
F	Geum triflorum	-	2	-	-	.00	.00
F	Lychnis drummondii	a-	a-	b15	-	-	.07
F	Penstemon sp.	-	-	1	-	-	.00
F	Polygonum douglasii (a)	a-	c221	b186	-	.71	1.06
F	Potentilla gracilis	2	7	6	.00	.03	.04
F	Ranunculus inamoenus	-	-	6	-	-	.06
F	Senecio integerrimus	b19	b14	a-	.10	.26	-
F	Taraxacum officinale	a245	b329	b343	5.73	15.53	14.62
F	Thlaspi montanum	28	45	78	.16	.33	.32
F	Tragopogon dubius (a)	1	-	-	.03	-	-
F	Trifolium sp.	11	21	12	.07	.17	.10
F	Unknown forb-perennial	a-	b15	a-	-	.14	-
Total for Annual Forbs		2	385	514	0.03	1.61	4.18
Total for Perennial Forbs		570	1042	952	10.23	27.82	34.72
Total for Forbs		572	1427	1466	10.27	29.43	38.90

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

BASIC COVER--

Management unit 28, Study no: 17

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	41.18	59.90	67.97
Rock	6.98	2.33	2.09
Pavement	13.15	5.21	5.66
Litter	30.30	24.59	18.79
Cryptogams	0	.03	0
Bare Ground	18.93	15.89	14.05

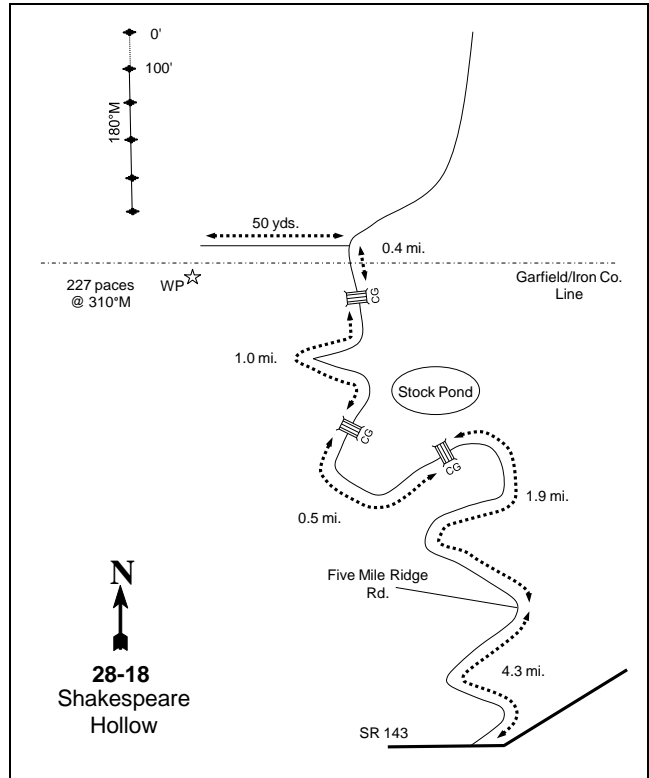
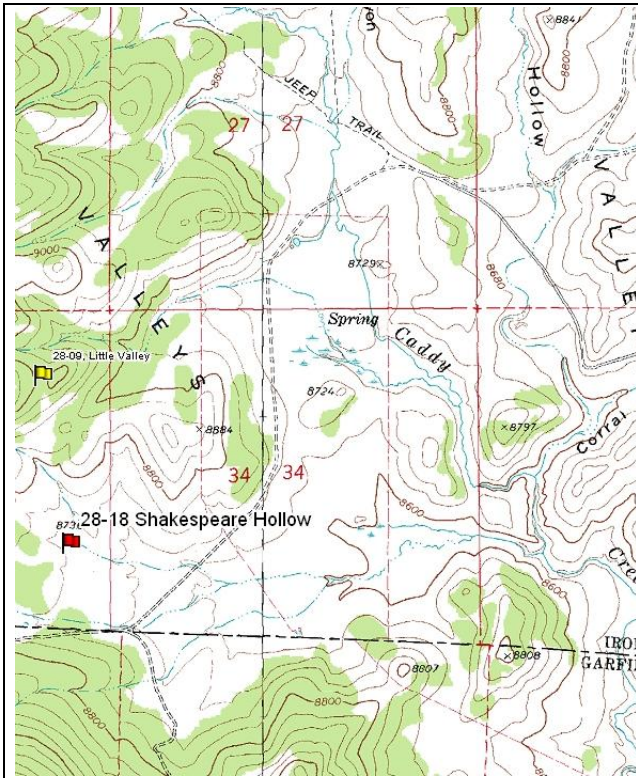
PELLET GROUP DATA--

Management unit 28, Study no: 17

Type	Quadrat Frequency		
	'03	'08	'13
Rabbit	5	-	-
Elk	28	47	36
Deer	10	8	13
Cattle	3	3	5

Days use per acre (ha)		
'03	'08	'13
-	-	-
97 (240)	135 (332)	45 (111)
27 (66)	3 (7)	13 (33)
-	-	4 (11)

SHAKESPEARE HOLLOW - TREND STUDY NO. 28-18



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Red Creek Reservoir; Township 34S, Range 7W, Section 33  
NAD 83, UTM Zone 12, 356018 East 4185925 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
180° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
Belt 1 and 4: 5ft

**Directions to Site**

From Panguitch, go south towards Panguitch Lake. At mile marker 41, turn right onto a dirt road. Proceed up Pole Hollow 4.3 miles to the Five Mile Ridge Road. Continue straight 1.9 miles to a cattleguard. Continue 0.5 miles to a cattle-guard and stock-pond. Continue 1.0 miles to another cattleguard. Go 0.4 miles to a fork at the Iron County-Garfield County line. Bear right, go 50 yards, and park by a witness post and aspen on the left side of the road (south). From the witness post, walk 227 paces at 310° magnetic to another witness post. The 0-foot stake is west-southwest of the witness post.

### Site Information

Land Ownership USFS  
Allotment Little Valleys  
Elevation 8,750ft (2,667m)  
Aspect East  
Slope 4%  
Sample Dates 07/16/2003, 06/23/2008, 06/05/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Summer; Elk, Substantial Summer, Calving; Sage-Grouse, Habitat Not Winter

### VEGETATION HISTORY--

Management unit 28, Study no: 18

Year	Vegetation Type <sup>1</sup>
2003-2013	Silver Sagebrush/Bitterbrush

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type).

### Site Notes

This study was established in 2003 about one-half mile south of the Little Valleys (28-9) study and samples a mountain brush community surrounded by pockets of aspen. This study replaces the Little Valleys transect, which was no longer representative of important summer range. The Little valleys transect was placed inside a thick aspen (*Populus tremuloides*) clone with a very dense snowberry (*Symphoricarpos albus*) understory that received very little use by big game or livestock. The new transect was left in the general area because of its importance to deer, elk, and sage-grouse. Bitterbrush (*Purshia tridentata*) received moderate to heavy utilization in 2003 and 2008 (Table - Browse Characteristics).

### Site Potential

1981-2010 Average Annual Precipitation 25 inches  
NRCS Taxonomical soil Classification Not Available  
NRCS Ecological Site High Mountain Loam (Silver Sagebrush)  
NRCS Ecological Site # R047XB517UT

### SOIL ANALYSIS DATA--

Management unit 28, Study no: 18

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	44.7	32.0	23.3	6.0	0.5	3.3	30.0	787.2	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

### States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [High Mountain Loam \(Silver Sagebrush\), R047XA517UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 2003, this site has remained a stable mixed silver sagebrush (*Artemisia cana*) and bitterbrush community with a few other shrubs with low cover (Table - Browse Trends). This community also supports a variety of native and introduced grasses with Kentucky bluegrass (*Poa pratensis*) and mutton bluegrass (*Poa fendleriana*) being the most abundant species. In addition, a diverse number of perennial and annual forbs provide little cover (Table - Herbaceous Cover).

## Trend Summary

HERBACEOUS TRENDS--  
Management unit 28, Study no: 18

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	<i>Bouteloua gracilis</i>	10	10	13	.38	.53	.79
G	<i>Koeleria cristata</i>	38	48	21	.31	.83	.29
G	<i>Poa fendleriana</i>	<sub>b</sub> 214	<sub>ab</sub> 174	<sub>a</sub> 143	5.05	6.35	6.76
G	<i>Poa pratensis</i>	<sub>a</sub> 8	<sub>b</sub> 198	<sub>c</sub> 269	.16	6.26	10.32
G	<i>Sitanion hystrix</i>	<sub>a</sub> 36	<sub>b</sub> 65	<sub>b</sub> 77	.37	1.34	1.01
G	<i>Stipa columbiana</i>	<sub>a</sub> 10	<sub>a</sub> 4	<sub>b</sub> 27	.21	.18	.72
G	<i>Stipa comata</i>	<sub>b</sub> 66	<sub>b</sub> 90	<sub>a</sub> 18	1.37	3.05	.66
G	<i>Stipa lettermani</i>	<sub>a</sub> 63	<sub>b</sub> 119	<sub>b</sub> 113	1.00	4.12	3.22
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		445	708	681	8.88	22.69	23.79
Total for Grasses		445	708	681	8.88	22.69	23.79
F	<i>Achillea millefolium</i>	<sub>a</sub> 31	<sub>ab</sub> 42	<sub>b</sub> 55	.13	1.02	1.01
F	<i>Agoseris glauca</i>	<sub>a</sub> 2	<sub>b</sub> 38	<sub>b</sub> 21	.00	.13	.10
F	<i>Androsace septentrionalis</i> (a)	<sub>a</sub> -	<sub>a</sub> 6	<sub>b</sub> 34	-	.02	.10
F	<i>Antennaria</i> sp.	<sub>a</sub> 10	<sub>b</sub> 30	<sub>a</sub> 6	.09	.48	.06
F	<i>Arabis</i> sp.	<sub>a</sub> -	<sub>b</sub> 9	<sub>b</sub> 11	-	.05	.03
F	<i>Artemisia dracunculus</i>	5	1	-	.38	.00	-
F	<i>Artemisia ludoviciana</i>	<sub>a</sub> 79	<sub>b</sub> 138	<sub>a</sub> 92	.81	2.08	.97
F	<i>Aster chilensis</i>	<sub>a</sub> 15	<sub>b</sub> 54	<sub>b</sub> 57	.10	.69	.81
F	<i>Astragalus</i> sp.	-	4	-	-	.15	-
F	<i>Calochortus nuttallii</i>	<sub>ab</sub> 11	<sub>b</sub> 23	<sub>a</sub> 5	.03	.08	.04
F	<i>Chenopodium fremontii</i> (a)	-	2	-	-	.00	-
F	<i>Collinsia parviflora</i> (a)	<sub>a</sub> 127	<sub>b</sub> 228	<sub>a</sub> 163	.63	1.21	.32
F	<i>Delphinium nuttallianum</i>	<sub>a</sub> 4	<sub>ab</sub> 14	<sub>b</sub> 21	.00	.09	.04
F	<i>Erigeron flagellaris</i>	<sub>b</sub> 79	<sub>b</sub> 51	<sub>a</sub> 5	1.05	.53	.06
F	<i>Erigeron pumilus</i>	<sub>a</sub> 133	<sub>b</sub> 42	<sub>a</sub> 104	2.11	.32	1.31
F	<i>Eriogonum racemosum</i>	65	92	88	1.55	1.76	1.44
F	<i>Eriogonum umbellatum</i>	34	29	19	.56	.52	.14
F	<i>Lewisia pygmaea</i>	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 21	-	.00	.05
F	<i>Lomatium</i> sp.	-	3	-	-	.01	-
F	<i>Microsteris gracilis</i> (a)	<sub>b</sub> 19	<sub>c</sub> 53	<sub>a</sub> -	.06	.12	-
F	<i>Navarretia breweri</i> (a)	<sub>a</sub> -	<sub>c</sub> 62	<sub>b</sub> 42	-	.19	.08
F	<i>Penstemon</i> sp.	21	22	14	.16	.18	.14
F	<i>Polygonum douglasii</i> (a)	<sub>a</sub> -	<sub>b</sub> 73	<sub>a</sub> 12	-	.21	.02
F	<i>Potentilla gracilis</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 13	-	-	.19
F	<i>Potentilla hippiana</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 12	-	-	.37
F	<i>Potentilla</i> sp.	<sub>ab</sub> 8	<sub>b</sub> 18	<sub>a</sub> -	.10	.43	-
F	<i>Senecio integerrimus</i>	<sub>a</sub> 3	<sub>b</sub> 52	<sub>b</sub> 60	.04	.68	.92
F	<i>Senecio multilobatus</i>	12	7	2	.05	.05	.03
F	<i>Sisymbrium altissimum</i> (a)	1	-	-	.00	-	-
F	<i>Taraxacum officinale</i>	<sub>a</sub> -	<sub>ab</sub> 4	<sub>b</sub> 10	-	.04	.11



Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
F	Tragopogon dubius (a)	20	5	11	.06	.03	.08
F	Trifolium sp.	<sub>a</sub> 21	<sub>b</sub> 58	<sub>b</sub> 41	.42	.90	.74
Total for Annual Forbs		167	429	262	0.76	1.80	0.60
Total for Perennial Forbs		533	732	657	7.63	10.24	8.60
Total for Forbs		700	1161	919	8.39	12.05	9.21

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

#### BROWSE TRENDS--

Management unit 28, Study no: 18

Type	Species	Quadrat Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	Artemisia cana	11.55	12.04	7.55	11.18	13.06	10.23
B	Chrysothamnus parryi	.74	.18	-	1.40	.10	-
B	Chrysothamnus viscidiflorus viscidiflorus	3.60	3.08	2.40	3.75	5.86	4.06
B	Gutierrezia sarothrae	-	-	.30	-	-	-
B	Purshia tridentata	9.35	6.20	10.24	13.05	9.89	14.60
B	Ribes sp.	.01	.30	.53	.11	.25	.13
Total for Browse		25.26	21.81	21.03	29.49	29.16	29.02

#### BASIC COVER--

Management unit 28, Study no: 18

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	39.66	55.81	55.97
Rock	9.71	6.40	6.20
Pavement	3.34	3.55	.96
Litter	33.43	21.52	45.53
Cryptogams	.18	.18	.03
Bare Ground	30.55	23.07	17.75

#### PELLET GROUP DATA--

Management unit 28, Study no: 18

Type	Quadrat Frequency		
	'03	'08	'13
Rabbit	2	2	-
Elk	8	4	15
Deer	17	15	4
Cattle	5	9	-

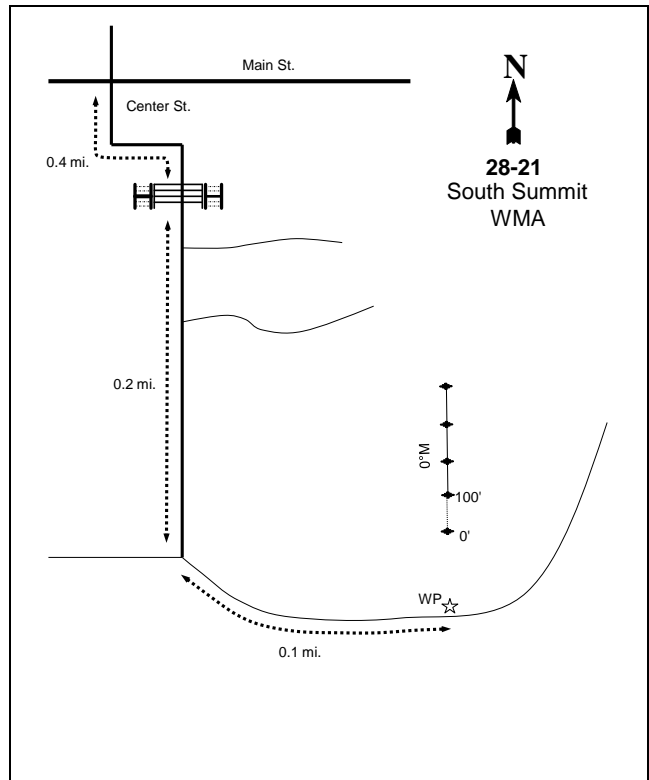
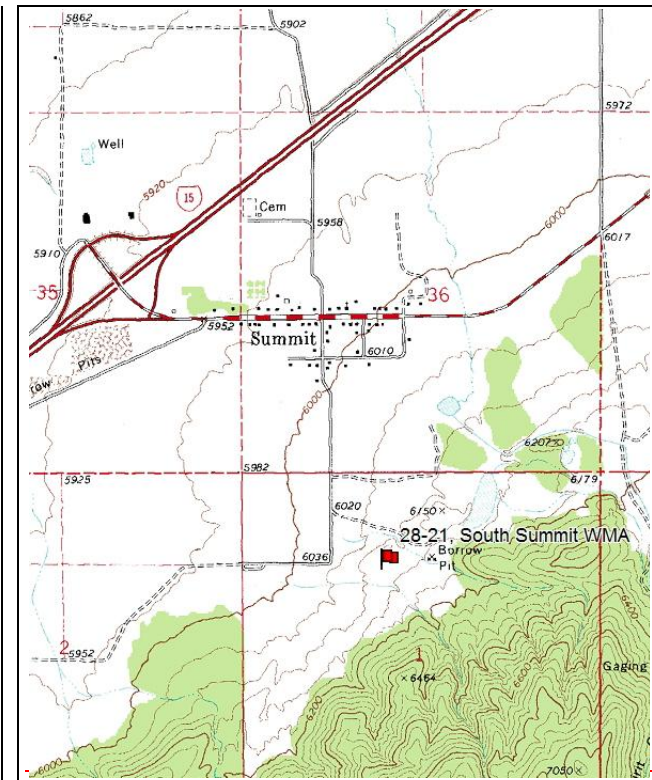
Days use per acre (ha)		
'03	'08	'13
-	-	-
24 (60)	4 (10)	19 (48)
23 (56)	23 (58)	9 (23)
16 (39)	12 (29)	5 (13)

BROWSE CHARACTERISTICS--

Management unit 28, Study no: 18

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 cana</i>									
03	<b>6400</b>	1	80	19	-	14	2	6	12/19
08	<b>8480</b>	13	49	38	1260	4	0	9	11/21
13	<b>7200</b>	18	74	8	-	10	0	9	11/19
<i>Chrysothamnus parryi</i>									
03	<b>1240</b>	0	94	6	-	32	2	0	8/10
08	<b>280</b>	14	57	29	-	21	0	7	10/19
13	<b>0</b>	0	0	0	-	0	0	0	6/18
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
03	<b>3020</b>	0	89	11	-	0	0	3	13/15
08	<b>3040</b>	8	72	20	140	0	0	5	11/17
13	<b>2720</b>	24	71	5	-	9	0	16	11/17
<i>Gutierrezia sarothrae</i>									
03	<b>60</b>	0	100	-	-	0	0	0	6/6
08	<b>0</b>	0	0	-	-	0	0	0	9/12
13	<b>100</b>	0	100	-	-	0	0	0	10/17
<i>Purshia tridentata</i>									
03	<b>1000</b>	2	90	8	-	20	80	0	21/59
08	<b>1060</b>	13	55	32	80	40	55	11	21/48
13	<b>1520</b>	12	84	4	40	37	20	4	23/55
<i>Ribes sp.</i>									
03	<b>20</b>	0	100	-	-	0	0	0	32/24
08	<b>20</b>	0	100	-	-	0	0	0	37/58
13	<b>40</b>	50	50	-	-	0	0	0	32/49
<i>Symphoricarpos oreophilus</i>									
03	<b>0</b>	0	0	-	-	0	0	0	15/18
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	25/28

SOUTH SUMMIT WMA - TREND STUDY NO. 28-21



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Panguitch; Township 35S, Range 10W, Section 1  
NAD 83, UTM Zone 12, 329793 East 4184348 North

**Transect Information**

Browse Tag # (0' Stake)	193
Transect Bearing	0° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)
Belt Marker Placement	No Rebar

**Directions to Site**

From the intersection of Center St and Main St in the city of Summit, travel south for 0.4 miles to a WMA gate. From the gate, continue for 0.2 miles to a T in the road. Take the fork on the left and travel for 0.1 miles to the witness post. From the witness post walk 12 paces at 25° magnetic to the 0-ft stake. The 0-ft stake is marked with browse tag number 193.

**Site Information**

Land Ownership UDWR  
 Allotment West Fork  
 Elevation 6,100ft (1,859m)  
 Aspect Southwest  
 Slope 10%  
 Sample Dates 07/14/2008, 06/06/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 21

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-
Herbicide	-	-	Historic	-
Lop and Scatter	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 21

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2008-2013	Basin Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The transect lies 1 mile south of Summit on a wildlife management area. Deer presence was fairly high in 2008 (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Xeric Haplocalcids  
 NRCS Ecological Site [Semidesert Loam \(Basin Big Sagebrush\)](#)  
 NRCS Ecological Site # R047XB220UT

**SOIL ANALYSIS DATA--**

Management unit 28, Study no: 21

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	64.0	20.4	15.6	7.2	1.14	1.5	25.9	172.8	2008

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 2008, this site has remained in a stable Basin Big Sagebrush (*Artemisia tridentata* ssp. *tridentata*) state. Perennial native and introduced grasses make up the majority of the herbaceous understory. The invasive perennial grass species bulbous bluegrass (*Poa bulbosa*) has increased significantly and may decrease the resilience of the sagebrush community. There are a limited number of forbs which contribute little cover (Table - Browse Trends; Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 28, study no: 21

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2008	8.9	-2.7	1.5	30.0	-0.7	0.0	0.0	<b>37.0</b>	Fair
2013	9.0	7.8	2.0	30.0	-0.1	0.3	0.0	<b>49.0</b>	Good

## HERBACEOUS TRENDS--

Management unit 28, Study no: 21

Type	Species	Nested Frequency		Average Cover %	
		'08	'13	'08	'13
G	Agropyron cristatum	135	147	4.45	4.82
G	Agropyron dasystachyum	<sub>a-</sub>	<sub>b</sub> 21	.00	.18
G	Agropyron intermedium	69	54	1.67	1.20
G	Aristida purpurea	<sub>b</sub> 243	<sub>a</sub> 200	11.16	12.51
G	Bromus tectorum (a)	<sub>b</sub> 121	<sub>a</sub> 41	.93	.15
G	Poa bulbosa	<sub>a</sub> 144	<sub>b</sub> 331	2.93	11.94
G	Sitanion hystrix	3	6	.15	.03
G	Sporobolus cryptandrus	62	88	1.24	2.05
Total for Annual Grasses		121	41	0.93	0.15
Total for Perennial Grasses		656	847	21.62	32.75
Total for Grasses		777	888	22.55	32.90
F	Astragalus lentiginosus	2	2	.00	.15
F	Erodium cicutarium (a)	<sub>a</sub> 3	<sub>b</sub> 49	.00	.29
F	Phlox austromontana	-	2	-	.00
F	Ranunculus testiculatus (a)	8	-	.01	-
F	Sphaeralcea coccinea	3	-	.01	-
Total for Annual Forbs		11	49	0.01	0.29
Total for Perennial Forbs		5	4	0.02	0.15
Total for Forbs		16	53	0.03	0.44

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

## BROWSE TRENDS--

Management unit 28, Study no: 21

Type	Species	Quadrat Cover %		Line Intercept Cover %	
		'08	'13	'08	'13
B	Artemisia tridentata tridentata	7.11	7.20	11.20	12.61
B	Gutierrezia sarothrae	1.10	.20	1.20	.28
B	Opuntia sp.	.15	-	.48	-
B	Opuntia whipplei	.33	.91	.20	1.25
Total for Browse		8.71	8.32	13.08	14.14

BASIC COVER--

Management unit 28, Study no: 21

Cover Type	Average Cover %	
	'08	'13
Vegetation	33.77	43.07
Rock	1.79	1.69
Pavement	17.07	9.57
Litter	43.83	45.45
Cryptogams	.31	.93
Bare Ground	15.44	13.62

PELLET GROUP DATA--

Management unit 28, Study no: 21

Type	Quadrat Frequency		Days use per acre (ha)	
	'08	'13	'08	'13
Rabbit	94	34	-	-
Elk	-	-	1 (2)	-
Deer	32	10	92 (228)	36 (88)
Cattle	5	4	12 (29)	25 (61)

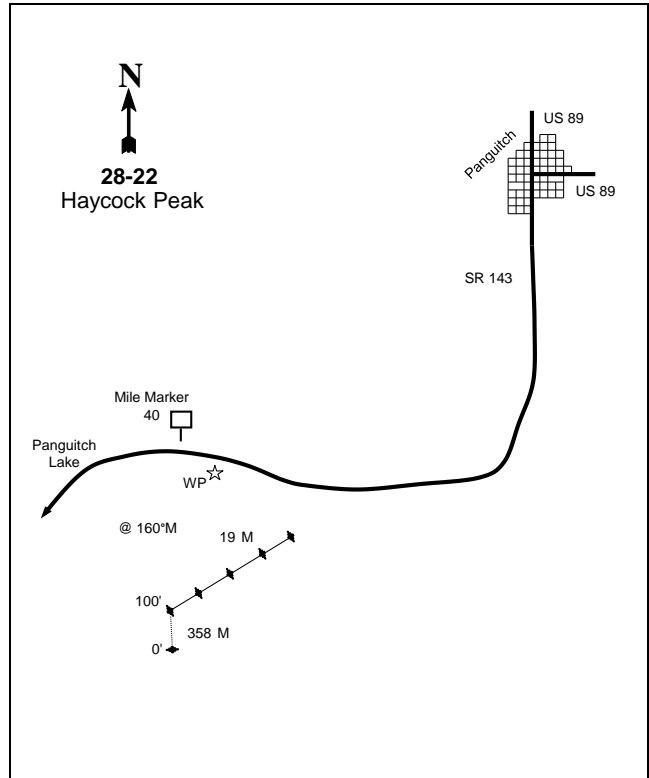
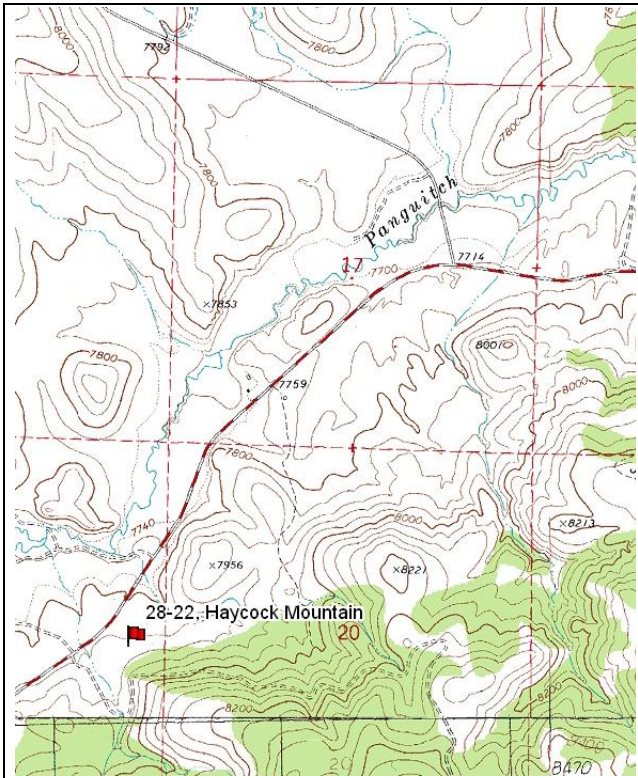
BROWSE CHARACTERISTICS--

Management unit 28, Study no: 21

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 nova</i>									
08	20	0	100	-	-	0	0	0	27/27
13	0	0	0	-	-	0	0	0	12/25
<i>Artemisia tridentata tridentata</i>									
08	2000	3	38	59	20	30	3	43	37/47
13	1660	4	72	24	-	17	20	39	34/41
<i>Gutierrezia sarothrae</i>									
08	2720	21	72	7	-	1	0	2	7/9
13	560	18	82	0	20	0	4	4	5/8
<i>Opuntia sp.</i>									
08	40	0	50	50	-	0	0	50	11/33
13	0	0	0	0	-	0	0	0	7/27
<i>Opuntia whipplei</i>									
08	120	17	83	-	-	0	0	0	14/32
13	140	0	100	-	-	0	0	0	15/39
<i>Pediocactus simpsonii</i>									
08	20	0	100	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Purshia tridentata										
08	0	0	0	-	-	0	0	0	19/71	
13	0	0	0	-	-	0	0	0	-/-	

HAYCOCK MOUNTAIN - TREND STUDY NO. 28-22



**Location Information**

USGS 7.5 min Map Info Fivemile Ridege; Township 35S, Range 6W, Section 19  
 GPS (0' Stake) NAD 83, UTM Zone 12, 362276 East 4179532 North

**Transect Information**

Browse Tag # (0' Stake) 175  
 Transect Bearing 358° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (95ft), Line 4 (71ft), Line 5 (59ft)  
 Belt Marker Placement Line 2: 2ft, line 5: 1ft

**Directions to Site**

Traveling from the town of Panguitch at the intersection of US 89 and SR 143, travel south on SR 143 for approximately 10.95 miles and pull to the side of the road. Using a GPS unit, navigate to the 0-foot stake that will be identified by the browse tag number 175.



**Site Information**

Land Ownership USFS  
 Allotment Haycock Mtn-Brian Head  
 Elevation 7,874ft (2,400m)  
 Aspect North  
 Slope 7%  
 Sample Dates 07/24/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Year-Long; Elk, Substantial Summer, Calving; Sage-Grouse, Opportunity Not Winter

VEGETATION HISTORY--

Management unit 28, Study no: 22

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2013	Bitterbrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Soils need to be sampled in the next rotation. The nearest water source is .25 miles away. There is some cheatgrass on the site though not on the transect. A dead fawn was found at the site in 2013. Deer presence was high in 2013 (Table – Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

This site was established in 2013 and was dominated by bitterbrush (*Purshia tridentata*) with a diverse component of other shrub species present that provided a fair amount of cover. Perennial grass species made up the majority of the herbaceous understory. Forbs were diverse, though cover was low (Table - Browse Trends; Table - Herbaceous Trends).

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 28, study no: 22

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2013	30.0	8.3	5.5	30.0	0.0	3.0	0.0	<b>76.8</b>	Good

HERBACEOUS TRENDS--

Management unit 28, Study no: 22

Type	Species	Nested	Average
		Frequency	Cover %
		'13	'13
G	Agropyron cristatum	27	.42
G	Agropyron dasystachyum	10	.21
G	Agropyron spicatum	22	.69
G	Bouteloua gracilis	99	2.80
G	Bromus anomalus	32	.83
G	Bromus carinatus	3	.06
G	Carex sp.	62	1.83
G	Oryzopsis hymenoides	2	.00
G	Poa fendleriana	124	4.39
G	Poa pratensis	43	1.33
G	Poa secunda	5	.21
G	Sitanion hystrix	63	1.56
G	Stipa columbiana	3	.18
G	Stipa comata	38	1.64
G	Stipa lettermani	60	2.45
Total for Annual Grasses		0	0
Total for Perennial Grasses		593	18.64
Total for Grasses		593	18.64
F	Androsace septentrionalis (a)	17	.03
F	Astragalus sp.	2	.00
F	Descurainia richardsonii (a)	1	.00
F	Erigeron divergens	77	.70
F	Erigeron eatonii	6	.02
F	Erigeron pumilus	19	.12
F	Euphorbia brachycera	8	.07
F	Ipomopsis aggregata	5	.01
F	Lepidium densiflorum (a)	6	.01
F	Linum lewisii	2	.00
F	Lotus utahensis	9	.02
F	Penstemon comarrhenus	9	.13
F	Penstemon sp.	9	.07
F	Phlox longifolia	6	.01
F	Potentilla gracilis	1	.03
F	Potentilla hippiana	6	.21
F	Senecio multilobatus	8	.04
F	Verbascum thapsus	1	.03
Total for Annual Forbs		24	0.04
Total for Perennial Forbs		168	1.49
Total for Forbs		192	1.54

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

BROWSE TRENDS--

Management unit 28, Study no: 22

Type	Species	Quadrat Cover %	Line Intercept Cover %
		'13	'13
B	Artemisia frigida	.03	-
B	Artemisia nova	2.62	5.28
B	Artemisia tridentata vaseyana	3.63	4.51
B	Chrysothamnus nauseosus	.18	-
B	Chrysothamnus viscidiflorus viscidiflorus	2.02	1.88
B	Gutierrezia sarothrae	.06	.13
B	Opuntia sp.	.21	-
B	Purshia tridentata	11.99	16.56
B	Tetradymia canescens	.03	-
Total for Browse		20.78	28.36

BASIC COVER--

Management unit 28, Study no: 22

Cover Type	Average Cover %
	'13
Vegetation	45.56
Rock	2.79
Pavement	8.24
Litter	37.59
Cryptogams	1.40
Bare Ground	20.85

PELLET GROUP DATA--

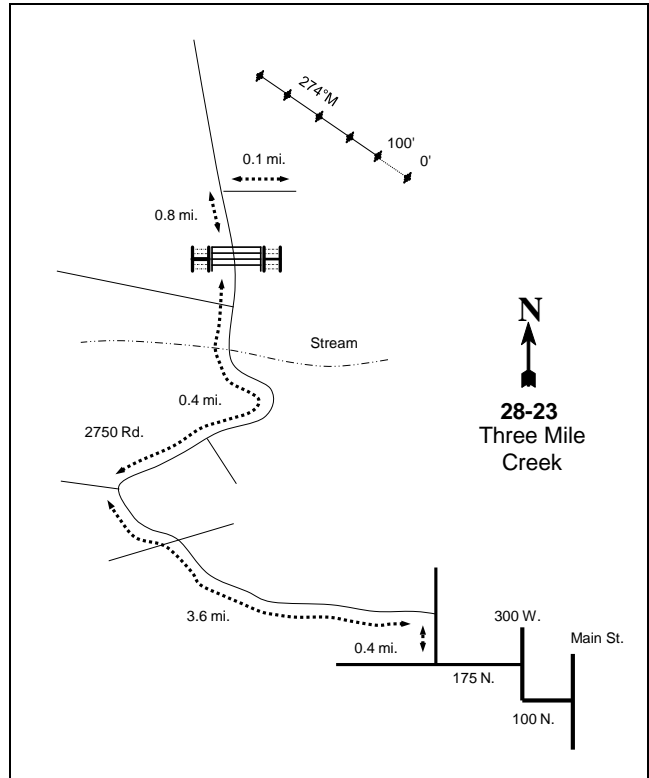
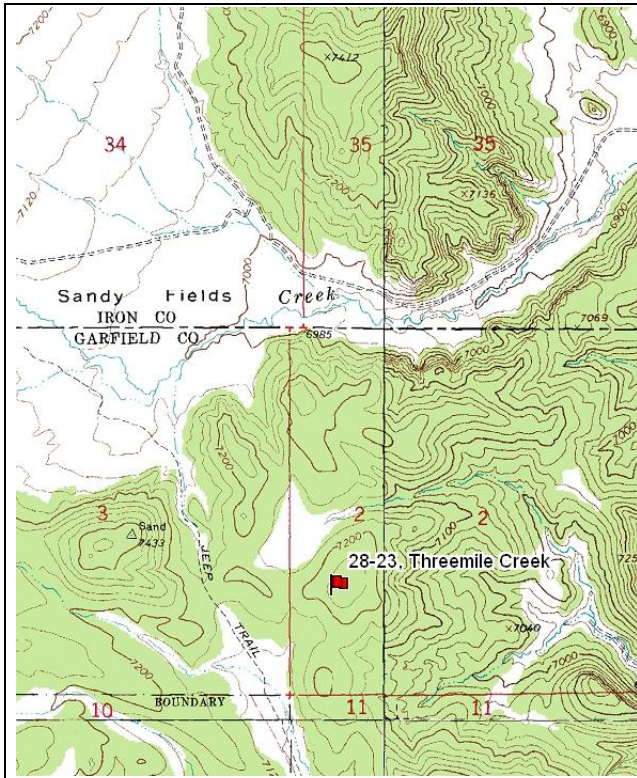
Management unit 28, Study no: 22

Type	Quadrat Frequency	Days use per acre (ha)
	'13	'13
Rabbit	7	-
Elk	16	33 (81)
Deer	38	60 (147)
Cattle	-	1 (2)

BROWSE CHARACTERISTICS--  
Management unit 28, Study no: 22

		Age class distribution					Utilization			
Y e a r	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Amelanchier utahensis										
13	<b>20</b>	0	100	-	-	100	0	100	20/17	
Artemisia nova										
13	<b>3020</b>	26	61	13	180	37	12	26	12/20	
Artemisia tridentata tridentata										
13	<b>60</b>	0	100	-	-	100	0	33	32/40	
Artemisia tridentata vaseyana										
13	<b>1180</b>	27	51	22	180	49	19	12	26/31	
Chrysothamnus nauseosus										
13	<b>160</b>	25	38	38	-	13	13	63	34/34	
Chrysothamnus viscidiflorus viscidiflorus										
13	<b>2080</b>	4	95	1	20	18	6	0	7/15	
Gutierrezia sarothrae										
13	<b>280</b>	0	100	-	-	0	0	0	8/10	
Opuntia sp.										
13	<b>60</b>	0	100	-	-	0	0	0	5/12	
Purshia tridentata										
13	<b>1780</b>	2	88	10	100	62	34	16	30/47	
Tetradymia canescens										
13	<b>80</b>	0	100	-	-	0	75	0	11/18	

THEEMILE CREEK - TREND STUDY NO. 28-23



**Location Information**

USGS 7.5 min Map Info Little Creek Peak; Township 34S, Range 6W, Section 2  
 GPS (0' Stake) NAD 83, UTM Zone 12, 367790 East 4193548 North

**Transect Information**

Browse Tag # (0' Stake) 149  
 Transect Bearing 274° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Belt 1: 2ft

**Directions to Site**

Travel 0.4 miles from the town of Panguitch at the intersection of 175 North (Pigweed Lane) and 700 West turn left onto Mud Spring Road. Travel 3.6 miles to an intersection and stay to the right. Travel 0.4 miles to a gate. Continue through the gate and travel 0.8 miles and turn right. Travel another 0.1 miles and park. Navigate to the 0-foot stake using a GPS. The 0-foot stake will be identified by a browse tag labeled 149.

**Site Information**

Land Ownership SITLA  
 Allotment Sandy Creek  
 Elevation 7,244ft (2,208m)  
 Aspect West  
 Slope 10-15%  
 Sample Dates 07/24/2013

**DISTURBANCE HISTORY--**

Management unit 28, Study no: 23

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining (2-Way Ely)	Panguitch West Bench Habitat Improvement	<a href="#">2373</a>	Fall 2012	276
Seeding (Aerial Before)	Panguitch West Bench Habitat Improvement	<a href="#">2373</a>	Fall 2012	276
Seeding (Dribbler)	Panguitch West Bench Habitat Improvement	<a href="#">2373</a>	Fall 2012	276
Seeding (Aerial Before)	Panguitch West Bench Habitat Improvement	<a href="#">2373</a>	Fall 2012	276

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 28, Study no: 23

Project Name: Panguitch West Bench Habitat Improvement							
<a href="#">WRI Database #: 2373</a>							
Application: Aerial		Acres: 276		Application: Dribbler		Acres: 276	
Seed type		lbs in mix	lbs/acre	Seed type		lbs in mix	lbs/acre
G	Alfalfa 'Ladak DL'	550	1.99	F	Arrowleaf Balsamroot	10	0.04
G	Bluebunch Wheatgrass 'Anatone	150	0.54	F	Small Burnet 'Delar'	100	0.36
G	Canby Bluegrass 'Canbar'	135	0.49	B	Bitterbrush	50	0.18
G	Cicer Milkvetch 'Lutana'	400	1.45	B	Green Ephedra	30	0.11
G	Crested Wheatgrass 'Douglas'	150	0.54	Total Pounds:		190	0.69
G	Crested Wheatgrass 'Hycrest II'	150	0.54	PLS Pounds:			0.45
G	Indian Ricegrass 'Rimrock'	200	0.72	Application: Dribbler		Acres: 276	
G	Palmer Penstemon	70	0.25	Seed type		lbs in mix	lbs/acre
F	Small Burnet 'Delar'	450	1.63	B	Forage Kochia	60	0.22
F	Tall Wheatgrass 'Alkar'	275	1	B	Sagebrush, Mountain Big	60	0.22
F	Western Yarrow 'Eagle Mountain'	25	0.09	B	Sagebrush, Wyoming Big	120	0.43
F	Yellow Sweetclover	150	0.54	Total Pounds:		240	0.87
Total Pounds:		2705	9.8	PLS Pounds:			0.45
PLS Pounds:			8.55				

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter; Sage-Grouse, Opportunity Not Winter

**VEGETATION HISTORY--**

Management unit 28, Study no: 23

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
2013	Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The site was treated the year prior to establishment of the study. Deer presence was very low in 2013 (Table - Pellet Group Data).

**\Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Lithic Haploborolls  
 NRCS Ecological Site Upland Shallow Loam (Pinyon-Utah Juniper)  
 NRCS Ecological Site # R047XB326UT

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Upland Shallow Loam \(Pinyon-Utah Juniper\), R036XY315UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

When established in 2013, pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) trees were recently treated and provided low cover, though many of the young trees were not affected by the treatment. Other browse species were sparse and provide little cover (table browse Trends). The herbaceous understory vegetation on this site was very sparse. With the density of young pinyon and juniper trees that were not affected by the treatment, this site has the potential to become tree dominated (Table - Point-Quarter Tree Data).

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
 Management unit 28, study no: 23

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2013	0.3	0.0	0.0	3.1	0.0	0.4	0.0	<b>3.7</b>	Very Poor

HERBACEOUS TRENDS--

Management unit 28, Study no: 23

Type	Species	Nested Frequency '13	Average Cover % '13
G	Bouteloua gracilis	51	1.16
G	Carex sp.	2	.00
G	Oryzopsis hymenoides	2	.01
G	Poa fendleriana	16	.34
G	Sitanion hystrix	6	.01
Total for Annual Grasses		0	0
Total for Perennial Grasses		77	1.53
Total for Grasses		77	1.53
F	Cryptantha sp.	1	.00
F	Descurainia pinnata (a)	3	.18
F	Gayophytum ramosissimum(a)	1	.00
F	Penstemon caespitosus	7	.03
F	Penstemon palmeri	4	.15
F	Polygonum douglasii (a)	3	.00
F	Portulaca oleracea (a)	30	.06
F	Sanguisorba minor	8	.02

Type	Species	Nested Frequency	Average Cover %
		'13	'13
	Total for Annual Forbs	37	0.25
	Total for Perennial Forbs	20	0.21
	Total for Forbs	57	0.47

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

#### BROWSE TRENDS--

Management unit 28, Study no: 23

Type	Species	Quadrat Cover %	Line Intercept Cover %
		'13	'13
B	Artemisia nova	.07	.21
B	Gutierrezia sarothrae	.09	.08
B	Juniperus osteosperma	.30	.36
B	Opuntia sp.	.18	-
B	Pinus edulis	.24	.96
	Total for Browse	0.89	1.61

#### POINT-QUARTER TREE DATA--

Management unit 28, Study no: 23

Species	Trees per Acre	Average diameter (in)
	'13	'13
Juniperus osteosperma	75	3.2
Pinus edulis	89	2

#### BASIC COVER--

Management unit 28, Study no: 23

Cover Type	Average Cover %
	'13
Vegetation	2.72
Rock	21.18
Pavement	5.34
Litter	52.98
Cryptogams	.16
Bare Ground	20.74



PELLET GROUP DATA--

Management unit 28, Study no: 23

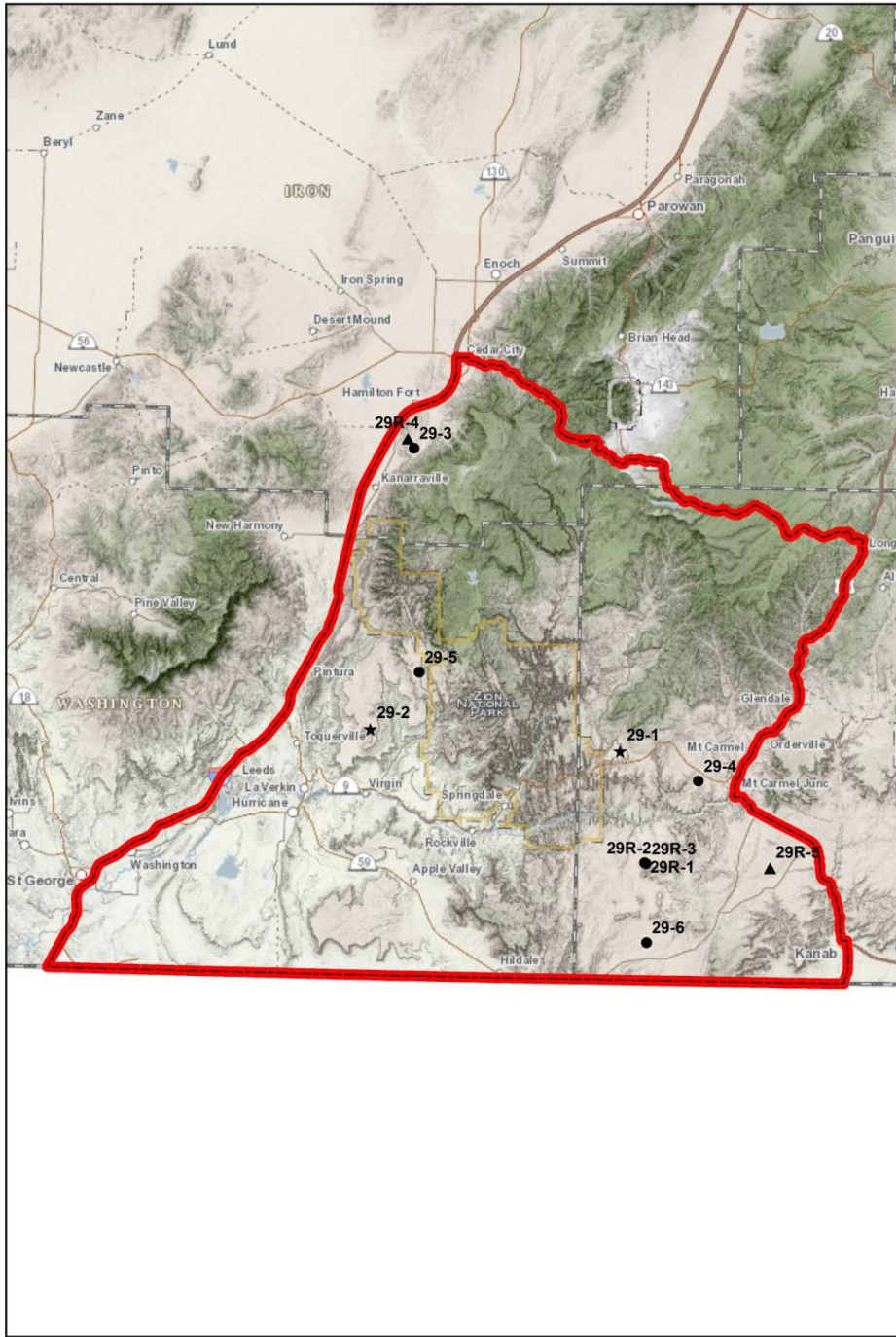
Type	Quadrat Frequency	Days use per acre (ha)
	'13	'13
Rabbit	3	-
Deer	1	1 (2)

BROWSE CHARACTERISTICS--

Management unit 28, Study no: 23

		Age class distribution					Utilization		
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
<i>Artemisia nova</i>									
13	<b>180</b>	0	44	56	-	11	0	22	10/17
<i>Artemisia tridentata vaseyana</i>									
13	<b>20</b>	0	100	-	-	0	0	0	11/17
<i>Cercocarpus ledifolius</i>									
13	<b>0</b>	0	0	-	-	0	0	0	31/33
<i>Gutierrezia sarothrae</i>									
13	<b>200</b>	50	50	-	-	0	0	0	9/10
<i>Juniperus osteosperma</i>									
13	<b>60</b>	0	33	67	-	0	0	67	-/-
<i>Opuntia sp.</i>									
13	<b>120</b>	0	83	17	20	0	0	17	5/11
<i>Pinus edulis</i>									
13	<b>180</b>	67	33	-	40	0	0	44	-/-
<i>Purshia tridentata</i>									
13	<b>20</b>	100	0	-	-	0	0	0	-/-

# WILDLIFE MANAGEMENT UNIT 29 - ZION

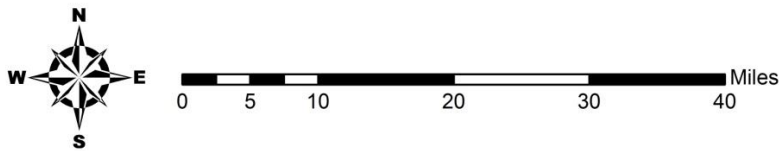
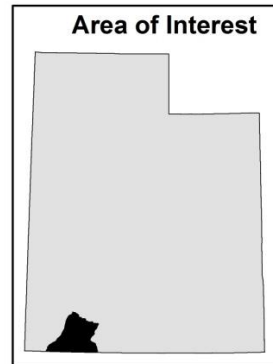


**Unit - 29**

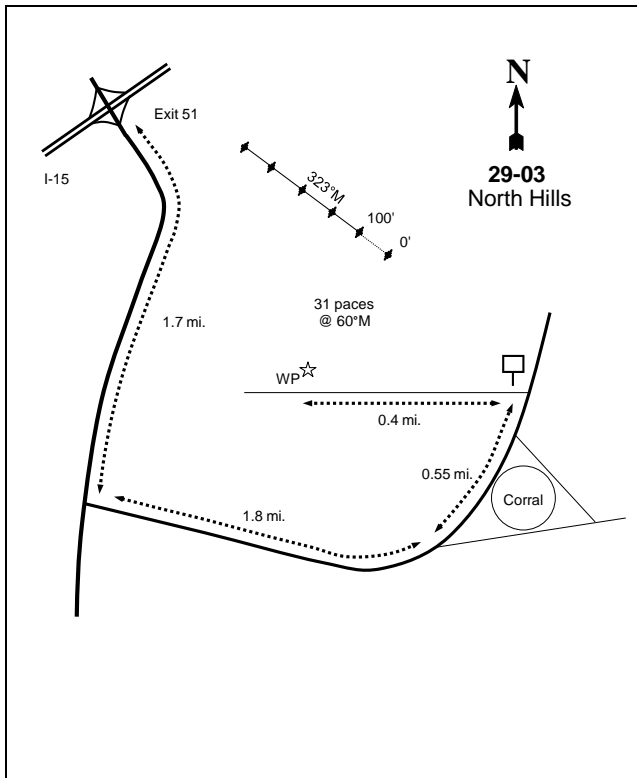
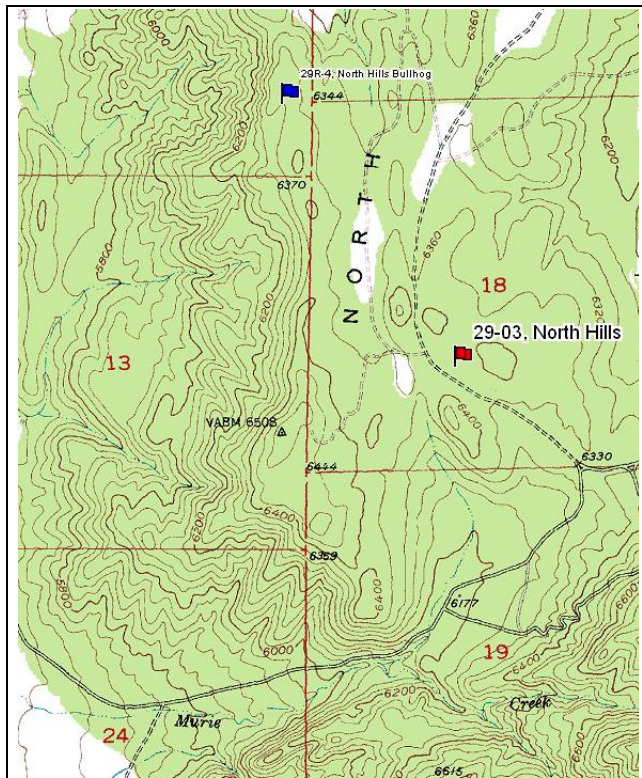
**Study Location**

**Project, Status**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active



## NORTH HILLS - TREND STUDY NO. 29-3



**Location Information**

USGS 7.5 min Map Info      Kanarraville; Township 37S, Range 11W, Section 18  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 311445 East 4161327 North

**Transect Information**

Browse Tag # (0' Stake)      Not Available  
 Transect Bearing              323° magnetic  
 Length                          500ft  
 Belt Placement                Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement      Belt 4: 1ft

**Directions to Site**

From Exit 51 (Hamilton Fort), cross under the highway and proceed south on the east side of the freeway for 1.7 miles. Turn left and go 1.8 miles to a corral. Stay left for 0.55 miles to a turnoff into the chaining with a sign that says "North Hills Reseeding." Continue 0.4 miles to a witness post on the right. Walk 31 paces at 60 degrees magnetic to the 0-foot stake.

**Site Information**

Land Ownership BLM  
 Allotment Hamilton Fort  
 Elevation 6,390ft (1,948m)  
 Aspect Southeast  
 Slope 5%  
 Sample Dates 07/16/1998, 07/08/2003, 07/08/2008, 05/20/2013

**DISTURBANCE HISTORY--**

Management unit 29, Study no: 3

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1967	-
Seeding	-	-	1967	-
Lop and Scatter	-	-	2008-2013	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter; Elk, Substantial Winter

**VEGETATION HISTORY--**

Management unit 29, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Since site establishment, deer pellet groups have been observed in high abundance, but decreased dramatically in 2013 (Table - Pellet Group Data). In 2013, cattle were seen on site, and wheatgrass species (*Agropyron* sp.) were heavily grazed. Utah serviceberry (*Amelanchier utahensis*) had a minor infestation of tent caterpillars in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Loamy, mixed, mesic, shallow Petrocalcic Palexerolls  
 NRCS Ecological Site [Upland Loam \(Mountain Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY310UT

**SOIL ANALYSIS DATA--**

Management unit 29, Study no: 3

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	70.0	14.2	15.8	6.8	0.5	3.1	9.4	16.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since site establishment in 1998, the site has maintained a stable stand of mixed mountain brush that includes species such as Utah serviceberry, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and Gambel oak (*Quercus gambelii*) that have dominated the site (Table - Browse Trends). The introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) has remained a major component of the understory over the duration of the study (Table - Browse Trends; Table - Herbaceous Trends). Pinyon pine (*Pinus edulis*) and

Utah juniper (*Juniperus osteosperma*) have been a minor component of the site, but pinyon and juniper woodlands have dominated the areas surrounding the study site (Table - Point-Quarter Tree Data).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 29, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	22.3	8.0	6.5	30.0	-0.2	0.7	0.0	<b>67.3</b>	Good
2003	21.0	5.2	6.4	18.4	0.0	0.9	0.0	<b>51.9</b>	Poor-Fair
2008	23.1	10.4	14.1	10.8	-0.5	0.2	0.0	<b>58.2</b>	Fair
2013	26.1	12.1	15.0	16.3	-0.7	0.3	0.0	<b>69.1</b>	Good

#### HERBACEOUS TRENDS--

Management unit 29, Study no: 3

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	b271	a233	ab231	a202	19.65	7.71	4.41	7.27
G	Agropyron intermedium	c142	b86	a43	ab62	3.05	1.12	.89	.42
G	Aristida purpurea	-	4	-	-	-	.15	.00	-
G	Bromus tectorum (a)	a24	a17	b120	c207	.23	.05	.62	.95
G	Hilaria jamesii	6	6	3	7	.41	.18	.03	.07
G	Oryzopsis hymenoides	3	-	-	-	.00	-	-	-
G	Poa fendleriana	-	-	-	2	-	-	-	.15
G	Poa secunda	10	-	2	5	.33	-	.03	.18
G	Sitanion hystrix	b21	a6	a3	a-	.46	.06	.03	-
G	Stipa comata	-	-	5	1	-	-	.01	.03
G	Vulpia octoflora (a)	3	-	-	-	.00	-	-	-
Total for Annual Grasses		27	17	120	207	0.23	0.05	0.62	0.95
Total for Perennial Grasses		453	335	287	279	23.91	9.22	5.42	8.13
Total for Grasses		480	352	407	486	24.15	9.28	6.04	9.08
F	Arabis sp.	1	-	-	-	.00	-	-	-
F	Astragalus lentiginosus	12	9	12	20	.30	.36	.06	.06
F	Chaenactis douglasii	-	1	-	3	-	.03	-	.01
F	Collinsia parviflora (a)	-	-	-	2	-	-	-	.00
F	Draba sp. (a)	-	2	-	1	-	.03	-	.00
F	Gilia sp. (a)	-	3	-	-	-	.00	-	-
F	Hymenoxys richardsonii	-	-	-	2	-	-	-	.03
F	Lactuca serriola (a)	-	-	-	1	-	-	-	.00
F	Lithospermum incisum	10	9	4	9	.03	.07	.03	.03
F	Microsteris gracilis (a)	-	4	-	8	-	.01	-	.02
F	Navarretia intertexta (a)	1	-	-	-	.00	-	-	-
F	Oenothera albicaulis (a)	a-	a3	a8	b22	-	.03	.01	.44
F	Phlox longifolia	-	-	4	3	-	-	.01	.00
F	Ranunculus testiculatus (a)	a-	a4	b18	a4	-	.01	.03	.01

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Sphaeralcea grossulariifolia</i>	-	2	2	-	-	.00	.00	-
Total for Annual Forbs		1	16	26	38	0.00	0.09	0.05	0.48
Total for Perennial Forbs		23	21	22	37	0.34	0.47	0.10	0.14
Total for Forbs		24	37	48	75	0.34	0.56	0.16	0.63

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

#### BROWSE TRENDS--

Management unit 29, Study no: 3

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Amelanchier utahensis</i>	2.34	2.58	4.55	5.44	3.95	4.65	6.35
B	<i>Artemisia nova</i>	.30	.00	.18	.15	.15	.71	.65
B	<i>Artemisia tridentata vaseyana</i>	13.00	11.44	11.49	12.20	8.23	12.15	10.06
B	<i>Chrysothamnus viscidiflorus</i>	.00	-	.15	.03	-	-	-
B	<i>Purshia tridentata</i>	-	-	.03	.15	-	.01	-
B	<i>Quercus gambelii</i>	2.19	2.79	1.69	2.31	4.36	7.36	4.05
Total for Browse		17.84	16.82	18.09	20.29	16.69	24.88	21.11

#### POINT-QUARTER TREE DATA--

Management unit 29, Study no: 3

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
<i>Juniperus osteosperma</i>	29	38	38	26	1.3	1.2	2.6	2.1
<i>Pinus edulis</i>	18	<18	25	21	2.0	-	2.2	2.8

#### BASIC COVER--

Management unit 29, Study no: 3

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	39.57	24.71	22.65	27.14
Rock	6.72	5.57	6.51	5.04
Pavement	12.20	17.24	25.10	5.28
Litter	51.78	36.99	34.39	37.33
Cryptogams	.41	.03	.01	.02
Bare Ground	21.43	34.08	25.33	42.10

PELLET GROUP DATA--

Management unit 29, Study no: 3

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	28	32	78	50
Elk	5	-	2	-
Deer	58	34	28	22
Cattle	1	2	5	2

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
6 (15)	1 (2)	3 (7)	-
103 (254)	118 (291)	60 (147)	24 (60)
4 (10)	5 (13)	10 (25)	2 (5)

BROWSE CHARACTERISTICS--

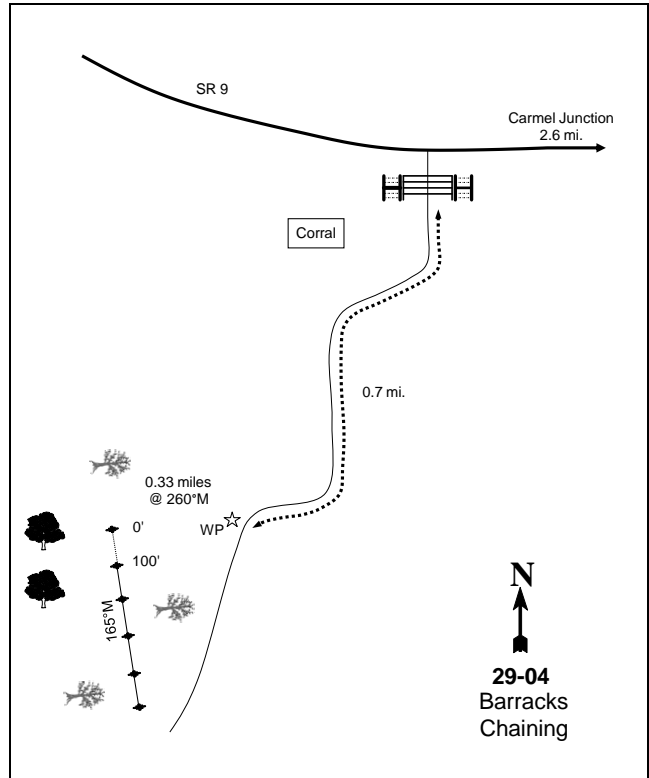
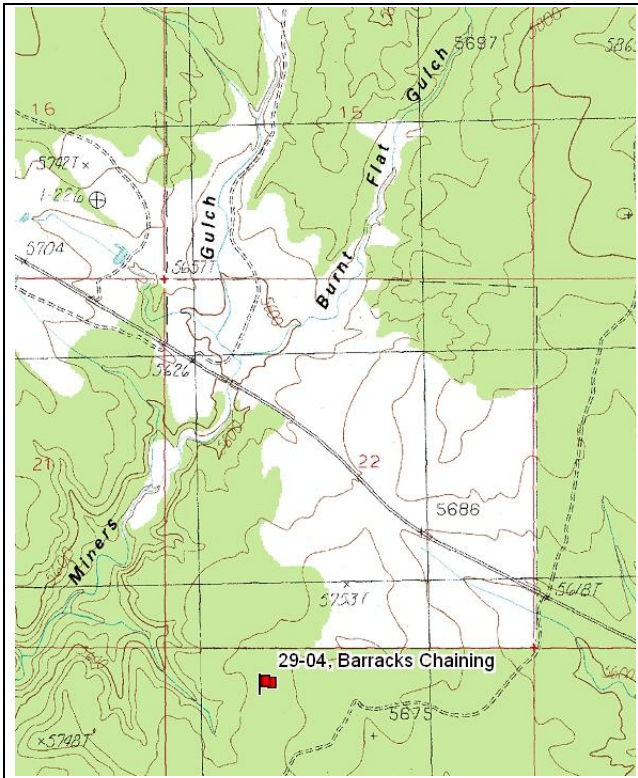
Management unit 29, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
98	<b>1040</b>	37	60	4	-	21	2	0	38/56
03	<b>560</b>	50	50	0	-	29	14	0	42/51
08	<b>740</b>	65	35	0	20	22	22	3	46/53
13	<b>600</b>	47	53	0	20	30	40	0	51/70
<b>Artemisia nova</b>									
98	<b>120</b>	0	83	17	-	83	0	0	13/24
03	<b>20</b>	0	100	0	-	0	0	0	13/28
08	<b>120</b>	33	67	0	-	17	33	0	15/33
13	<b>100</b>	20	80	0	-	20	0	0	16/25
<b>Artemisia tridentata vaseyana</b>									
98	<b>1860</b>	5	63	31	120	56	14	13	26/37
03	<b>1820</b>	4	47	48	-	48	37	9	25/33
08	<b>2240</b>	14	62	24	580	39	21	5	27/42
13	<b>2420</b>	24	60	16	240	37	16	12	24/40
<b>Chrysothamnus nauseosus hololeucus</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	42/26
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus</b>									
98	<b>0</b>	0	0	-	20	0	0	0	-/-
03	<b>20</b>	100	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	6/7
13	<b>20</b>	100	0	-	-	0	0	0	5/5
<b>Gutierrezia sarothrae</b>									
98	<b>0</b>	0	0	-	-	0	0	0	12/9
03	<b>20</b>	0	100	-	-	0	0	0	8/11
08	<b>100</b>	20	80	-	-	0	0	0	5/5
13	<b>20</b>	0	100	-	-	0	0	0	6/9

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Juniperus osteosperma</b>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>20</b>	100	0	-	-	0	0	0	-/-	
08	<b>20</b>	100	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	20	0	0	0	-/-	
<b>Opuntia sp.</b>										
98	<b>40</b>	0	50	50	-	0	0	50	5/6	
03	<b>0</b>	0	0	0	-	0	0	0	5/13	
08	<b>0</b>	0	0	0	-	0	0	0	4/11	
13	<b>0</b>	0	0	0	-	0	0	0	7/11	
<b>Purshia tridentata</b>										
98	<b>20</b>	0	100	-	-	100	0	0	39/72	
03	<b>20</b>	0	100	-	-	0	100	0	37/52	
08	<b>20</b>	0	100	-	80	0	0	0	32/56	
13	<b>20</b>	0	100	-	-	100	0	0	51/92	
<b>Quercus gambelii</b>										
98	<b>940</b>	36	64	-	60	0	0	0	50/28	
03	<b>1420</b>	15	85	-	-	0	0	0	49/32	
08	<b>1900</b>	26	74	-	140	5	0	0	39/23	
13	<b>960</b>	46	54	-	-	2	23	0	32/16	



BARRACKS CHAINING - TREND STUDY NO. 29-4



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Mount Carmel; Township 41S, Range 8W, Section 27  
NAD 83, UTM Zone 12, 346133 East 4120740 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
165° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line (95ft)  
Standard

**Directions to Site**

From the junction of US 89 and SR 9 (Carmel Junction), proceed west on SR 9 for 2.6 miles to a road on the left (south) side of the highway. Turn left on this road and go through a gate, proceed 0.7 miles passing a corral on the right side of the road to a witness post on the right side. From the witness post, walk one-third to one-half mile at 260 degrees magnetic to the 0-foot stake.

**Site Information**

Land Ownership BLM  
 Allotment Barracks Point  
 Elevation 5,730ft (1,747m)  
 Aspect West  
 Slope 7%  
 Sample Dates 07/29/2003, 07/01/2008, 07/30/2013

**DISTURBANCE HISTORY--**

Management unit 29, Study no: 4

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 29, Study no: 4

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2003-2013	Perennial Grass/Mixed Mountain Brush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Deer pellet groups have been found in high abundance over the duration of the study (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R035XY308UT

**SOIL ANALYSIS DATA--**

Management unit 29, Study no: 4

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	62.6	14.7	22.7	6.5	0.5	1.0	4.0	448.0	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since site establishment in 2003, the site has maintained a stable stand of antelope bitterbrush (*Purshia tridentata*) that has dominated the site (Table - Browse Trends). This old chaining is surrounded on three sides by unchained pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), making it susceptible to re-encroachment and dominance of these species. The introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) and intermediate wheatgrass (*A. intermedium*) have also maintained dominance within the understory over the duration of the study (Table - Browse Trends; Table - Herbaceous Trends).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 29, study no: 4

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2003	7.6	8.4	6.7	11.1	-0.4	10.0	0.0	<b>43.2</b>	Poor
2008	7.5	6.5	10.3	28.0	-1.0	10.0	0.0	<b>61.3</b>	Fair
2013	6.2	0.0	0.0	29.5	-0.2	2.9	0.0	<b>38.3</b>	Poor

HERBACEOUS TRENDS--  
Management unit 29, Study no: 4

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Agropyron cristatum	<sub>a</sub> 46	<sub>b</sub> 108	<sub>b</sub> 134	1.20	3.94	5.06
G	Agropyron intermedium	<sub>a</sub> 117	<sub>b</sub> 213	<sub>b</sub> 229	3.42	9.59	8.33
G	Agropyron spicatum	-	-	7	-	-	.41
G	Aristida purpurea	-	-	1	-	-	.03
G	Bouteloua gracilis	<sub>a</sub> 1	<sub>b</sub> 60	<sub>a</sub> 8	.15	.44	.36
G	Bromus tectorum (a)	<sub>a</sub> 9	<sub>c</sub> 146	<sub>b</sub> 75	.57	1.36	.32
G	Oryzopsis hymenoides	5	-	-	.03	-	-
G	Poa fendleriana	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 11	-	.00	.09
G	Sitanion hystrix	2	7	-	.00	.02	-
G	Sporobolus cryptandrus	<sub>b</sub> 48	<sub>a</sub> 8	<sub>ab</sub> 22	.71	.01	.44
G	Vulpia octoflora (a)	<sub>ab</sub> 2	<sub>b</sub> 9	<sub>a</sub> -	.01	.03	-
Total for Annual Grasses		11	155	75	0.58	1.39	0.32
Total for Perennial Grasses		219	397	412	5.53	14.01	14.73
Total for Grasses		230	552	487	6.11	15.41	15.05
F	Amaranthus graecizans	4	-	-	.01	-	-
F	Chaenactis douglasii	-	5	-	-	.01	-
F	Chenopodium fremontii (a)	-	1	-	.15	.00	-
F	Collinsia parviflora (a)	<sub>a</sub> -	<sub>b</sub> 11	<sub>a</sub> -	-	.05	-
F	Dalea searlsiae	33	31	19	2.53	1.99	.26
F	Descurainia pinnata (a)	-	4	-	-	.04	-
F	Erigeron divergens	1	6	-	.03	.04	-
F	Euphorbia sp.	27	50	37	.55	.75	.30
F	Gayophytum ramosissimum(a)	-	6	-	-	.02	-
F	Gilia sp. (a)	-	7	-	-	.01	-
F	Hymenopappus filifolius	5	-	9	.06	-	.04
F	Lappula occidentalis (a)	<sub>a</sub> -	<sub>c</sub> 99	<sub>b</sub> 34	-	3.11	.15
F	Lotus utahensis	2	-	-	.15	-	-
F	Lupinus sp.	-	1	-	-	.01	-
F	Nicotiana attenuata (a)	6	-	-	1.04	-	-
F	Penstemon humilis	1	1	6	.00	.03	.06
F	Penstemon leonardi	1	8	5	.03	.04	.03

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
F	Phlox longifolia	b <sup>9</sup>	a <sup>3</sup>	a <sup>-</sup>	.02	.00	-
F	Polygonum douglasii (a)	-	-	1	-	-	.00
F	Psoralea tenuiflora	15	11	4	1.61	.24	.04
F	Solanum triflorum (a)	b <sup>23</sup>	a <sup>-</sup>	a <sup>-</sup>	1.40	-	-
F	Sphaeralcea parvifolia	a <sup>66</sup>	b <sup>113</sup>	ab <sup>93</sup>	2.56	3.73	.69
F	Tragopogon dubius (a)	-	-	2	.03	-	.03
Total for Annual Forbs		29	128	37	2.63	3.24	0.18
Total for Perennial Forbs		164	229	173	7.57	6.87	1.45
Total for Forbs		193	357	210	10.20	10.12	1.63

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

#### BROWSE TRENDS--

Management unit 29, Study no: 4

Type	Species	Average Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	1.70	1.51	.09	1.60	3.30	1.18
B	Artemisia tridentata vaseyana	.38	.82	1.56	.73	1.00	3.28
B	Chrysothamnus viscidiflorus viscidiflorus	-	-	.00	-	-	-
B	Juniperus osteosperma	1.62	2.11	3.37	1.83	2.48	3.96
B	Opuntia sp.	-	.03	.38	-	-	.01
B	Pinus edulis	1.01	2.11	2.36	1.23	1.70	2.60
B	Purshia tridentata	3.03	2.82	2.34	3.71	3.55	4.40
B	Quercus gambelii	-	-	.63	-	-	1.38
B	Rhus trilobata	-	-	-	-	-	.05
B	Symphoricarpos oreophilus	-	-	.53	-	-	2.46
Total for Browse		7.76	9.40	11.28	9.1	12.03	19.32

#### POINT-QUARTER TREE DATA--

Management unit 29, Study no: 4

Species	Trees per Acre			Average diameter (in)		
	'03	'08	'13	'03	'08	'13
Juniperus osteosperma	47	36	37	3.1	6.7	6.0
Pinus edulis	56	39	40	2.6	4.7	4.8

BASIC COVER--

Management unit 29, Study no: 4

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	22.40	35.04	31.28
Rock	.03	0	0
Pavement	.04	.04	0
Litter	42.30	46.73	60.03
Cryptogams	.21	.12	.19
Bare Ground	47.20	36.32	25.34

PELLET GROUP DATA--

Management unit 29, Study no: 4

Type	Quadrat Frequency			Days use per acre (ha)		
	'03	'08	'13	'03	'08	'13
Rabbit	35	89	55	-	-	-
Horse	1	-	-	-	-	1 (1)
Elk	1	-	1	-	-	-
Deer	31	24	23	45 (111)	56 (139)	62 (154)
Cattle	9	6	1	14 (34)	25 (61)	11 (27)

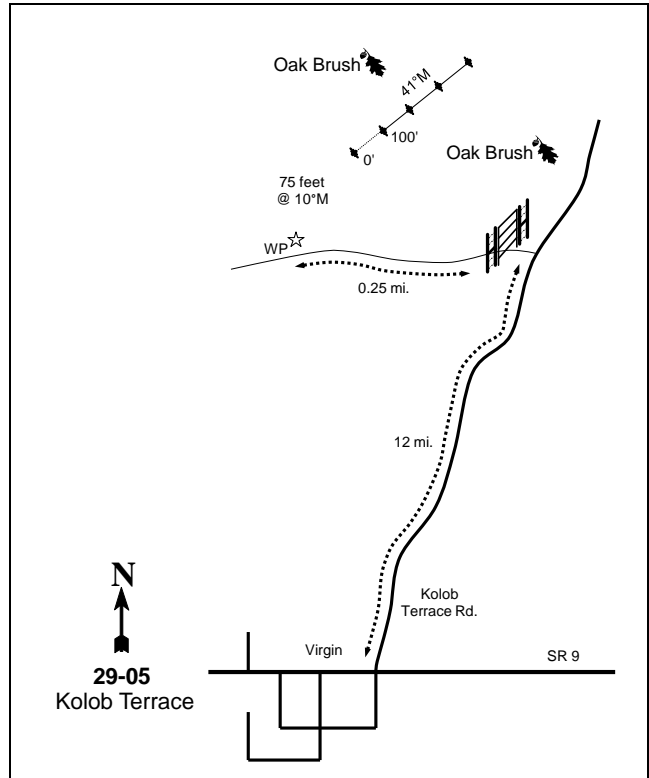
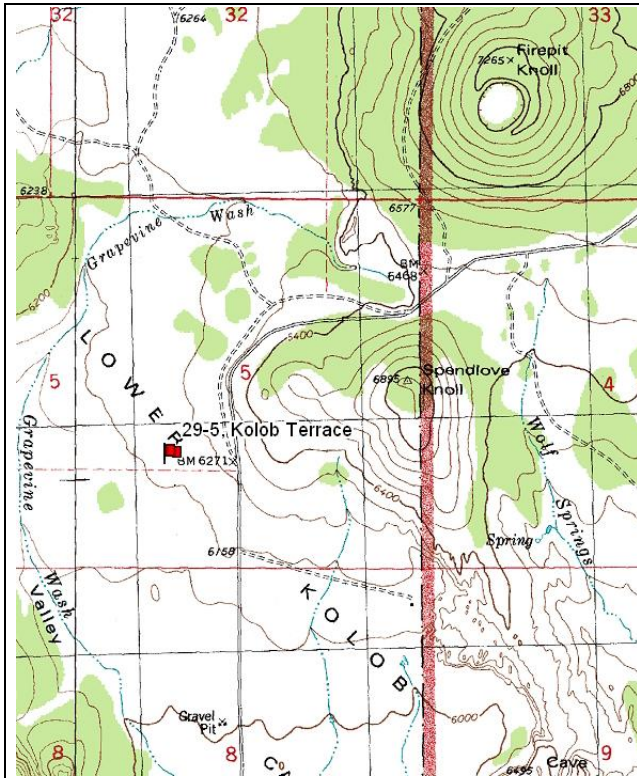
BROWSE CHARACTERISTICS--

Management unit 29, Study no: 4

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
03	<b>100</b>	40	60	-	-	40	0	0	81/92
08	<b>20</b>	0	100	-	-	0	0	0	108/120
13	<b>20</b>	0	100	-	-	0	0	0	72/71
<b>Artemisia tridentata vaseyana</b>									
03	<b>60</b>	0	67	33	-	33	33	0	16/27
08	<b>740</b>	84	11	5	5300	5	0	0	16/17
13	<b>780</b>	44	54	3	140	23	18	0	18/24
<b>Chrysothamnus nauseosus</b>									
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	35/36
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	17/10
13	<b>20</b>	100	0	-	-	0	0	0	-/-
<b>Gutierrezia sarothrae</b>									
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	15/23

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>Juniperus osteosperma</i>									
03	120	100	0	-	-	0	0	0	-/-
08	60	33	67	-	-	0	0	0	-/-
13	60	0	100	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
03	0	0	0	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	5/9
13	20	0	100	-	-	0	0	0	6/30
<i>Peraphyllum ramosissimum</i>									
03	0	0	0	-	-	0	0	0	87/103
08	20	0	100	-	-	0	0	0	76/115
13	0	0	0	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
03	60	33	67	-	-	0	0	0	-/-
08	60	0	100	-	-	0	0	0	-/-
13	60	33	67	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
03	180	0	67	33	-	56	44	11	54/86
08	160	13	38	50	-	38	0	25	59/87
13	120	0	100	0	-	83	17	0	64/95
<i>Quercus gambelii</i>									
03	0	0	0	-	-	0	0	0	26/25
08	0	0	0	-	-	0	0	0	44/31
13	100	0	100	-	-	0	0	0	-/-
<i>Rhus trilobata</i>									
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	95/126
<i>Symphoricarpos oreophilus</i>									
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	106/123

KOLOB TERRACE - TREND STUDY NO. 29-5



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

The Guardian Angels; Township 40S, Range 11W, Section 05  
NAD 83, UTM Zone 12, 312071 East 4134023 North

**Transect Information**

Browse Tag # (0' Stake)	116
Transect Bearing	41° magnetic
Length	400ft
Belt Placement	Line 1 (11ft & 95ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)
Belt Marker Placement	Standard

**Directions to Site**

Heading east out of the town of Virgin on SR 9 turn left (North) onto Kolob Terrace road, travel 12 miles to dirt road with a gate on the left side of the road. Turn here. Travel a quarter mile to a witness post on the right side (north) of the road. From the witness, the 0 foot stake is 75 feet away at 10 degrees magnetic. The 0 foot stake is identified by the browse tag labeled #116.

**Site Information**

Land Ownership BLM  
 Allotment Kolob Terrace  
 Elevation 6,197ft (1,889m)  
 Aspect South  
 Slope 6%  
 Sample Dates 05/22/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

VEGETATION HISTORY--

Management unit 29, Study no: 5

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A soil sample needs to be taken for analysis during the next sampling. In 2013, tent caterpillars were observed on site and seemed to only infest Utah serviceberry (*Amelanchier utahensis*). Additionally, deer pellet groups were heavily concentrated near Gamble oak (*Quercus gambelii*) stands.

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Coarse-loamy, mixed, mesic Typic Haplustolls  
 NRCS Ecological Site Upland Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R035XY308UT

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 2013, the site was a mixed stand of mountain brush that included mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Gamble oak, and antelope bitterbrush (*Purshia tridentata*). The invasive annual grass species cheatgrass (*Bromus tectorum*) occurred in patches on the site and poses a threat to the resilience of the study site. Perennial grass and forb species were infrequent and were a minor component of the community (Table - Browse Trends; Table - Herbaceous Trends).

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 29, study no: 5

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2013	30.0	8.0	12.5	2.6	-2.4	5.0	0.0	55.6	Fair



HERBACEOUS TRENDS--

Management unit 29, Study no: 5

T y p e	Species	Nested Frequency	Average Cover %
		'13	'13
G	Agropyron intermedium	2	.06
G	Bromus inermis	38	1.18
G	Bromus tectorum (a)	224	3.16
G	Sporobolus cryptandrus	4	.03
G	Vulpia octoflora (a)	24	.05
Total for Annual Grasses		248	3.21
Total for Perennial Grasses		44	1.28
Total for Grasses		292	4.49
F	Arabis sp.	1	.00
F	Brodiaea pulchella	25	.09
F	Comandra pallida	2	.03
F	Cryptantha sp.	8	.02
F	Eriogonum racemosum	2	.01
F	Erysimum capitatum	6	.06
F	Heterotheca villosa	46	1.96
F	Lotus utahensis	9	.21
F	Lupinus sp.	1	.00
F	Navarretia intertexta (a)	5	.01
F	Oenothera pallida	13	.10
F	Polygonum douglasii (a)	1	.00
F	Sphaeralcea parvifolia	4	.01
F	Tragopogon dubius (a)	3	.15
Total for Annual Forbs		9	0.16
Total for Perennial Forbs		117	2.52
Total for Forbs		126	2.68

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

BROWSE TRENDS--

Management unit 29, Study no: 5

T y p e	Species	Average Cover %	Line Intercept Cover %
		'13	'13
B	Artemisia tridentata vaseyana	19.91	26.86
B	Opuntia sp.	.00	-
B	Purshia tridentata	2.22	3.00
B	Quercus gambelii	6.44	10.08
Total for Browse		28.58	39.94

BASIC COVER--

Management unit 29, Study no: 5

Cover Type	Average Cover % '13
Vegetation	35.44
Rock	4.02
Pavement	.10
Litter	56.41
Cryptogams	.20
Bare Ground	29.35

PELLET GROUP DATA--

Management unit 29, Study no: 5

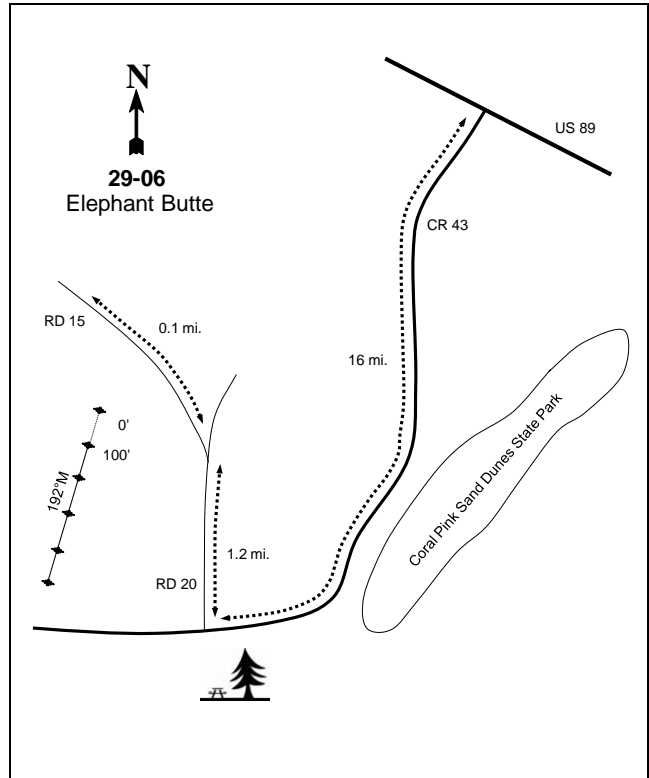
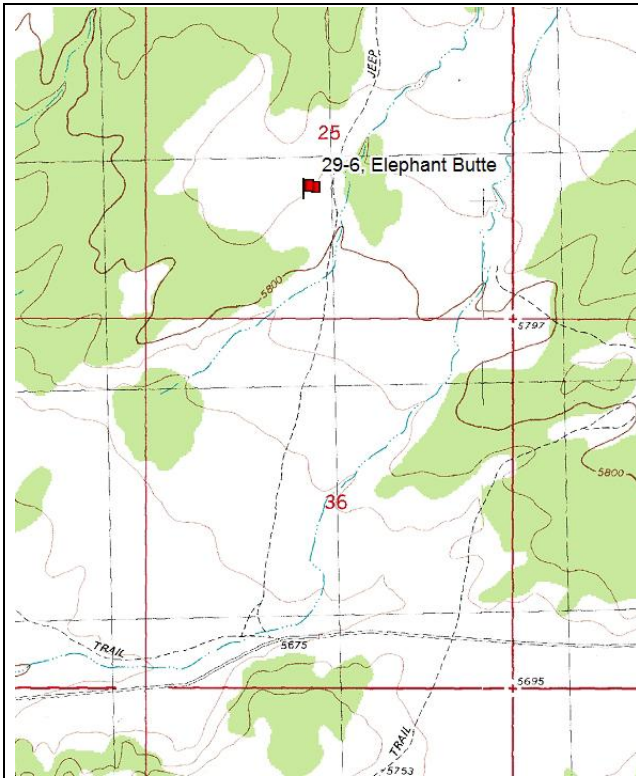
Type	Quadrat Frequency '13	Days use per acre (ha) '13
Rabbit	5	-
Deer	35	36 (89)
Cattle	-	3 (7)

BROWSE CHARACTERISTICS--

Management unit 29, Study no: 5

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)	
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor		
<i>Amelanchier utahensis</i>										
13	0	0	0	-	-	0	0	0	70/80	
<i>Artemisia tridentata vaseyana</i>										
13	2360	4	64	31	20	25	4	15	28/38	
<i>Chrysothamnus viscidiflorus</i>										
13	0	0	0	-	-	0	0	0	27/42	
<i>Opuntia sp.</i>										
13	60	0	100	-	20	0	33	33	5/14	
<i>Purshia tridentata</i>										
13	220	9	73	18	-	64	0	9	24/57	
<i>Quercus gambelii</i>										
13	2040	95	3	2	20	14	3	2	32/28	

ELEPHANT BUTTE - TREND STUDY NO. 29-6



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Elephant Butte; Township 43S, Range 9W, Section 25  
NAD 83, UTM Zone 12, 339813 East 4101011 North

**Transect Information**

Browse Tag # (0' Stake)	110
Transect Bearing	192° magnetic
Length	500ft
Belt Placement	Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line5 (95ft)
Belt Marker Placement	Standard

**Directions to Site**

From US 89 turn south onto CR 43, and travel 16 miles to an intersection with a picnic area to the south. Turn right (north) onto road number 20 and travel one and two-tenths miles to another intersection staying to the left. Travel a tenth of a mile and park. The 0 foot stake is identified by the browse tag labeled #110.

**Site Information**

Land Ownership BLM  
 Allotment Pine Springs  
 Elevation 5,842ft (1,781m)  
 Aspect South  
 Slope 2%  
 Sample Dates 07/30/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

VEGETATION HISTORY--

Management unit 29, Study no: 6

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2013	Basin Big Sagebrush/Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A soil sample needs to be taken for analysis during the next sampling. During the 2013 sampling, perennial grasses and forbs were observed to be robust with abundant seed and flower production. Deer pellet groups also occurred very abundantly in 2013 (Table - Pellet Group Data). One fawn and young buck carcass was found on site in 2013. Basin big sagebrush is found mainly in the bottom areas, while sand sagebrush is found mainly on the upper slopes of the study area.

**Site Potential**

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Sand (Mountain Big Sagebrush)  
 NRCS Ecological Site # R035XY307UT

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 2013, the site was a mixed stand of basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and Utah juniper (*Juniperus osteosperma*) that dominated the site with an understory of perennial and annual grasses and forbs that was sparse, but evenly dispersed across the site (Table - Browse Trends; Table - Herbaceous Trends). It is predicted that Utah juniper will continue to increase in dominance on the site and without disturbance; it will likely become a dominant component over time.

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 29, study no: 6

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2013	13.7	10.6	4.3	1.6	-0.1	3.3	0.0	<b>33.4</b>	Very Poor-Poor

HERBACEOUS TRENDS--

Management unit 29, Study no: 6

Type	Species	Nested Frequency	Average Cover %
		'13	'13
G	<i>Bouteloua gracilis</i>	4	.33
G	<i>Munroa squarrosa</i> (a)	16	.07
G	<i>Oryzopsis hymenoides</i>	4	.06
G	<i>Sporobolus cryptandrus</i>	29	.38
G	<i>Vulpia octoflora</i> (a)	2	.01
Total for Annual Grasses		18	0.08
Total for Perennial Grasses		37	0.78
Total for Grasses		55	0.86
F	<i>Ambrosia artemisiifolia</i>	11	.10
F	<i>Artemisia dracunculus</i>	17	.39
F	<i>Castilleja linariaefolia</i>	1	.38
F	<i>Eriogonum cernuum</i> (a)	25	.28
F	<i>Eriogonum umbellatum</i>	3	.03
F	<i>Euphorbia</i> sp.	138	.54
F	<i>Hymenopappus filifolius</i>	2	.03
F	<i>Lathyrus brachycalyx</i>	4	.04
F	<i>Linum aristatum</i> (a)	12	.51
F	<i>Oenothera pallida</i>	3	.01
F	<i>Portulaca oleracea</i> (a)	30	.33
F	<i>Sisymbrium altissimum</i> (a)	1	.00
F	<i>Sphaeralcea parvifolia</i>	16	.14
Total for Annual Forbs		68	1.12
Total for Perennial Forbs		195	1.67
Total for Forbs		263	2.79

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

BROWSE TRENDS--

Management unit 29, Study no: 6

Type	Species	Average Cover %	Line Intercept Cover %
		'13	'13
B	<i>Artemisia filifolia</i>	2.59	5.86
B	<i>Artemisia tridentata tridentata</i>	7.49	6.73
B	<i>Chrysothamnus nauseosus</i>	.62	1.01
B	<i>Juniperus osteosperma</i>	6.06	17.86
B	<i>Purshia tridentata</i>	2.91	3.48
Total for Browse		19.68	34.94

POINT-QUARTER TREE DATA--

Management unit 29, Study no: 6

Species	Trees per Acre	Average diameter (in)
	'13	'13
Juniperus osteosperma	32	9.2

BASIC COVER--

Management unit 29, Study no: 6

Cover Type	Average Cover %
	'13
Vegetation	23.78
Rock	.63
Pavement	.00
Litter	48.04
Cryptogams	1.53
Bare Ground	39.15

PELLET GROUP DATA--

Management unit 29, Study no: 6

Type	Quadrat Frequency	Days use per acre (ha)
	'13	'13
Rabbit	22	-
Deer	56	162 (400)

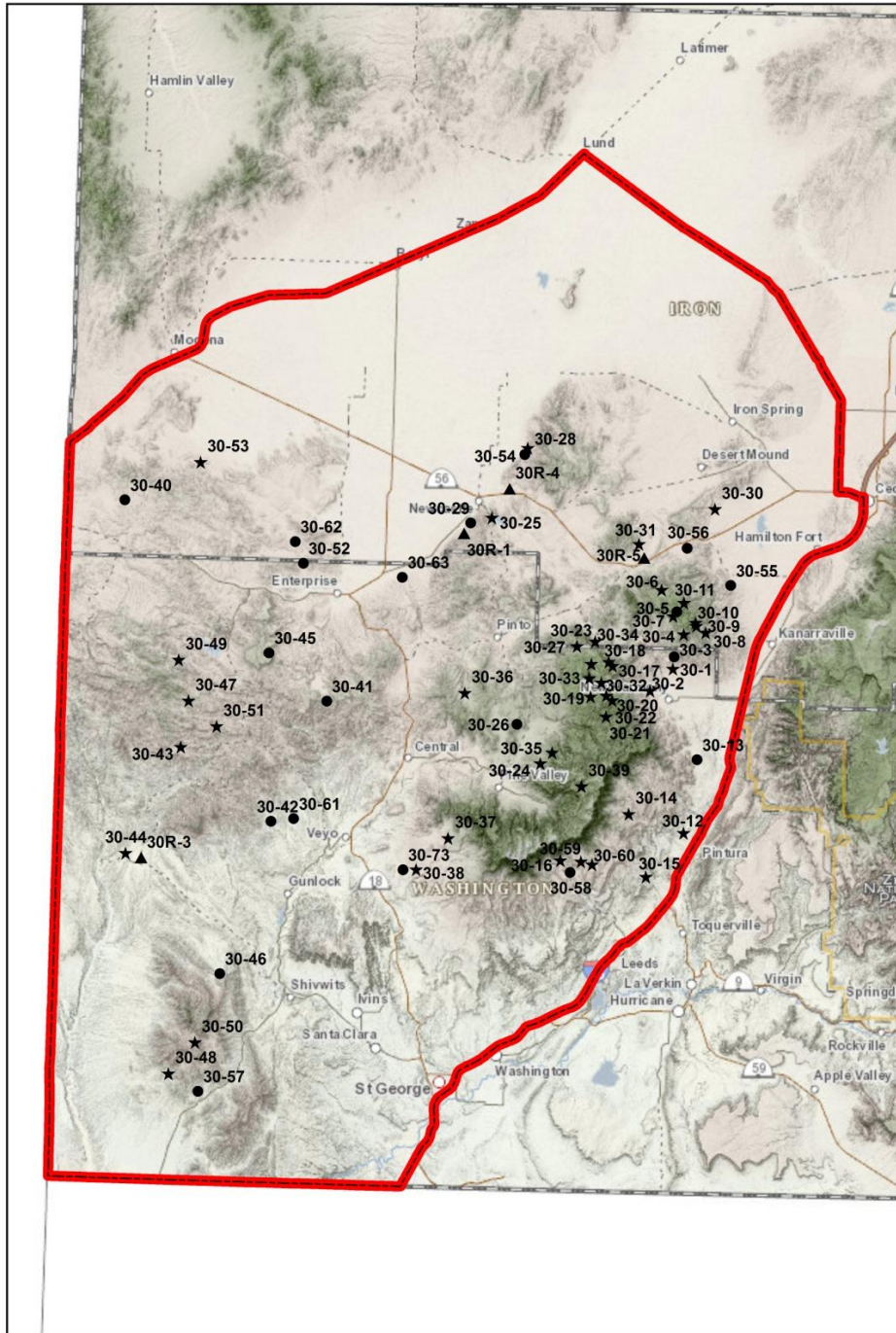
BROWSE CHARACTERISTICS--

Management unit 29, Study no: 6

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)	
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor		
Artemisia filifolia										
13	<b>700</b>	14	83	3	-	3	17	3	32/45	
Artemisia tridentata tridentata										
13	<b>1560</b>	9	71	21	40	36	50	12	28/32	
Chrysothamnus nauseosus										
13	<b>540</b>	70	26	4	-	0	0	7	29/36	
Chrysothamnus viscidiflorus viscidiflorus										
13	<b>60</b>	0	100	-	-	0	0	0	-/-	
Ephedra viridis										
13	<b>0</b>	0	0	-	-	0	0	0	32/30	
Juniperus osteosperma										
13	<b>40</b>	0	100	-	-	0	0	0	-/-	

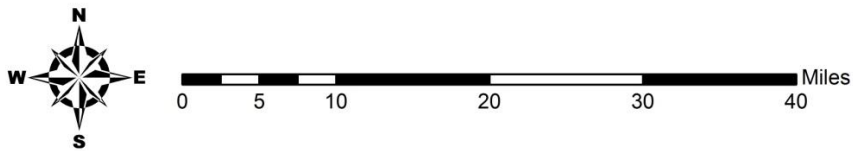
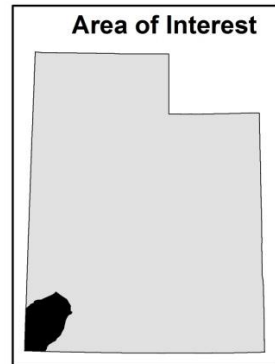
		Age class distribution			Utilization				
Y e a r	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Opuntia sp.									
13	<b>20</b>	0	100	-	-	0	0	0	5/16
Purshia tridentata									
13	<b>240</b>	8	92	-	20	0	92	0	42/54
Ribes sp.									
13	<b>0</b>	0	0	-	-	0	0	0	3/48
Yucca sp.									
13	<b>40</b>	0	100	-	-	0	0	0	32/56

# WILDLIFE MANAGEMENT UNIT 30 - PINE VALLEY



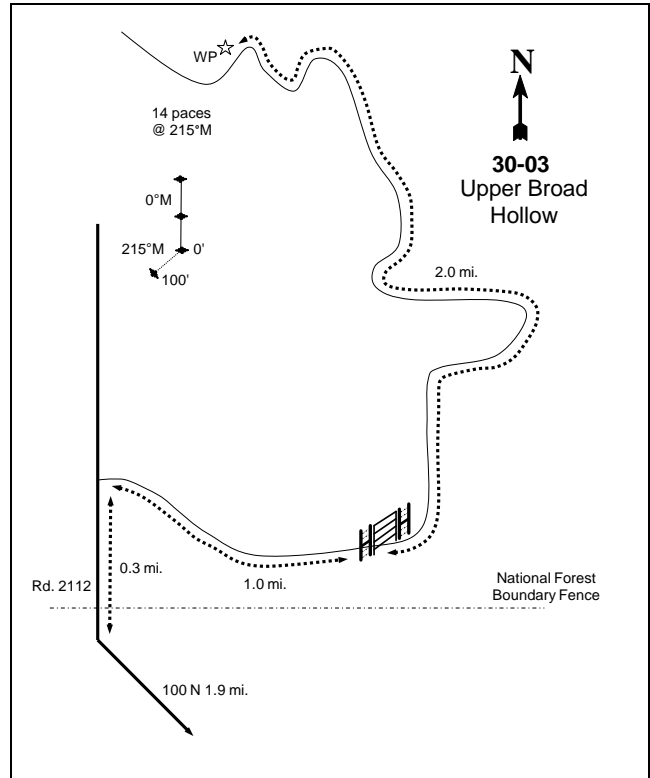
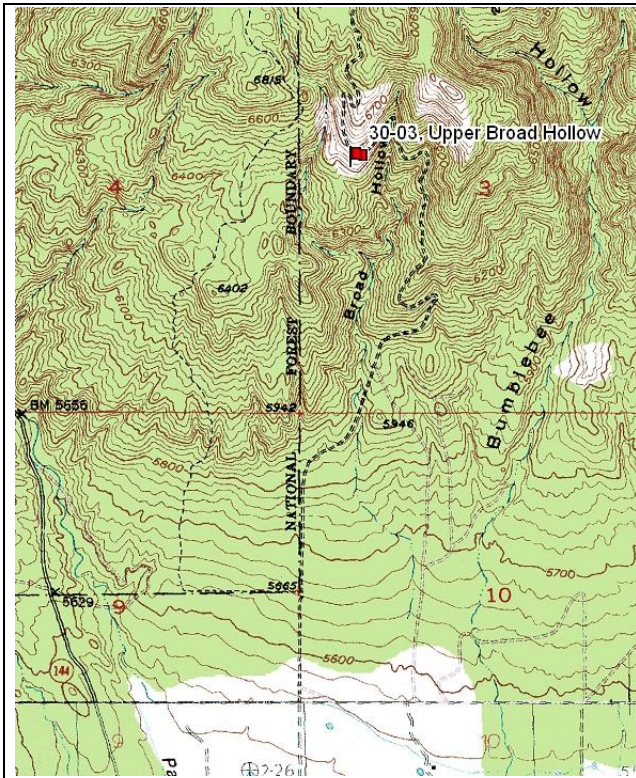
**Unit - 30**  
**Study Location**  
**Project, Status**

- RT, Active
- ★ RT, Suspended
- ▲ WRI, Active





UPPER BROAD HOLLOW - TREND STUDY NO. 30-3



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Stoddard Mountain; Township 38S, Range 13W, Section 3  
NAD 83, UTM Zone 12, 296193 East 4155175 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
215° magnetic (Line 2 and 3: 0° magnetic)  
300ft  
Line 1 (8ft & 89ft), Line 2 (34ft & 71ft), Line 3 (59ft)  
Belt 3: 1ft

**Directions to Site**

From the intersection of Harmony Drive and 100 N. in New Harmony, drive north 1.9 miles to the Dixie National Forest boundary. From the boundary, proceed north on Pace Draw Road (Road 2112) for 0.30 miles. Turn right onto Harmony Mountain Road and travel 1.0 miles, at which point there will be a gate. Go through the gate, turn left and travel 2.0 miles to a sharp right-hand turn in the road. On the southwestern side of the road is a witness post. Walk 14 paces at 215 degrees magnetic to the 300-foot stake. The study is marked by green steel "T" fence posts approximately 18 to 24 inches in height.

### Site Information

Land Ownership BLM  
Allotment New Harmony  
Elevation 6,510ft (1,984m)  
Aspect South  
Slope 35%  
Sample Dates 06/10/1982, 06/21/1992, 05/28/1998, 06/04/2003, 05/21/2008, 05/22/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter

#### VEGETATION HISTORY--

Management unit 30, Study no: 3

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982-1992	Mixed Mountain Brush	Phase I
1998-2013	Mixed Mountain Brush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Historic pellet group data from 1981-1997 is available from a DWR Broad Hollow pellet group transect that is located near the study site (Jense, et al., Utah Big Game Annual Report, 1992). A few deer shed antlers were found on the site in 2013. Soil analysis data is not available for this site.

### Site Potential

1981-2010 Average Annual Precipitation 19 inches  
NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Lithic Argiustolls  
NRCS Ecological Site Upland Stony Loam (Shrub Liveoak)  
NRCS Ecological Site # R029XY330UT

### States and Transitions

No state and transition model is available for the above ecological site.

Since establishment in 1982, the site has remained in a stable state as a mixed mountain brush with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Utah serviceberry (*Amelanchier utahensis*), antelope bitterbrush (*Purshia tridentata*), and shrub live oak (*Quercus turbinella*). The herbaceous understory has been diverse and moderately abundant over the sample years. The introduced annual grass species cheatgrass (*Bromus tectorum*) has fluctuated over the sample years and has been a major component of the herbaceous understory. Pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) have slowly increased over the sample years and has been common on the site (Table - Browse Trends; Table - Herbaceous Trends). Without disturbance, it is predicted that pinyon and juniper will continue to increase and become dominant on the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - HIGH POTENTIAL SCALE --  
Management unit 30, study no: 3

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	11.1	7.0	29.6	-7.1	7.1	0.0	<b>77.7</b>	Good
2003	30.0	10.9	9.8	17.7	-2.0	3.8	0.0	<b>70.2</b>	Fair-Good
2008	30.0	8.7	6.6	22.3	-1.2	3.3	0.0	<b>69.7</b>	Fair-Good
2013	25.9	12.9	9.1	24.7	-0.8	4.0	0.0	<b>75.9</b>	Good

## HERBACEOUS TRENDS--

Management unit 30, Study no: 3

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	-	-	1	-	.03	-	.00	-
G	Bouteloua gracilis	3	2	3	4	.15	.03	.03	.03
G	Bromus tectorum (a)	b311	a133	a142	a152	9.47	2.66	1.56	1.03
G	Festuca ovina	3	-	-	-	.00	-	-	-
G	Koeleria cristata	b33	ab29	ab21	a11	.81	.94	.81	.05
G	Poa fendleriana	c245	ab173	a177	bc226	13.12	6.58	9.60	10.75
G	Sitanion hystrix	ab21	b27	ab32	a9	.31	.90	.57	.22
G	Stipa comata	a7	ab11	a5	b22	.36	.39	.12	1.30
Total for Annual Grasses		311	133	142	152	9.47	2.66	1.56	1.03
Total for Perennial Grasses		312	242	239	272	14.79	8.85	11.13	12.36
Total for Grasses		623	375	381	424	24.26	11.52	12.69	13.39
F	Agoseris glauca	47	28	47	33	.58	.18	.38	.28
F	Allium sp.	10	-	-	4	.04	-	-	.00
F	Arabis sp.	-	2	-	-	-	.00	-	-
F	Arenaria macradenia	a-	b17	a1	b12	-	1.09	.15	.38
F	Artemisia ludoviciana	-	-	7	9	-	-	.03	.03
F	Aster sp.	1	-	-	3	.00	-	-	.03
F	Astragalus newberryi	-	-	-	3	-	-	-	.00
F	Astragalus sp.	bc19	a5	ab10	c41	.91	.04	.21	.86
F	Astragalus utahensis	-	-	-	-	.03	-	-	-
F	Brodiaea pulchella	b36	a-	b45	a1	1.56	-	.18	.00
F	Calochortus nuttallii	-	2	1	-	-	.00	.00	-
F	Castilleja linariaefolia	6	1	4	2	.06	.01	.01	.01
F	Collinsia parviflora (a)	a17	b60	ab31	ab27	.03	.55	.09	.08
F	Collomia linearis (a)	a-	b22	a-	a-	-	.37	-	-
F	Comandra pallida	-	6	-	-	-	.06	-	-
F	Cymopterus sp.	9	-	3	-	.06	-	.03	-
F	Descurainia pinnata (a)	b58	b73	a6	a7	.38	.99	.01	.01
F	Draba sp. (a)	2	6	6	-	.00	.01	.01	-
F	Erigeron pumilus	8	8	5	7	.07	.18	.18	.16

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Eriogonum racemosum</i>	-	1	-	-	-	.00	-	-
F	<i>Eriogonum</i> sp.	-	1	-	-	-	.00	-	-
F	<i>Erodium cicutarium</i> (a)	<sub>b</sub> 13	<sub>a</sub> -	<sub>a</sub> 1	<sub>a</sub> 3	.52	-	.00	.00
F	<i>Erysimum asperum</i>	3	-	-	-	.03	-	-	-
F	<i>Gilia</i> sp. (a)	<sub>a</sub> -	<sub>c</sub> 113	<sub>b</sub> 24	<sub>a</sub> -	-	1.01	.07	-
F	<i>Lappula occidentalis</i> (a)	-	3	7	-	-	.00	.01	-
F	<i>Microsteris gracilis</i> (a)	<sub>a</sub> 11	<sub>b</sub> 32	<sub>a</sub> 6	<sub>a</sub> 10	.03	.12	.02	.01
F	<i>Orobanche fasciculata</i>	-	-	2	-	-	-	.01	-
F	<i>Phlox hoodii</i>	-	1	5	6	-	.03	.16	.04
F	<i>Senecio multilobatus</i>	-	4	5	7	-	.01	.06	.04
F	<i>Sphaeralcea grossulariifolia</i>	7	4	8	5	.06	.04	.21	.04
F	<i>Stephanomeria tenuifolia</i>	<sub>b</sub> 18	<sub>b</sub> 8	<sub>a</sub> -	<sub>b</sub> 13	.13	.19	-	.10
F	<i>Zigadenus paniculatus</i>	3	1	-	-	.00	.00	-	-
Total for Annual Forbs		101	309	81	47	0.97	3.07	0.22	0.11
Total for Perennial Forbs		167	89	143	146	3.57	1.88	1.63	2.00
Total for Forbs		268	398	224	193	4.54	4.96	1.86	2.11

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

#### BROWSE TRENDS--

Management unit 30, Study no: 3

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Amelanchier utahensis</i>	12.87	11.09	10.02	7.58	11.76	9.48	13.38
B	<i>Artemisia nova</i>	-	.15	-	-	-	-	-
B	<i>Artemisia tridentata vaseyana</i>	8.79	6.16	8.01	5.48	5.96	8.96	8.75
B	<i>Chrysothamnus parryi</i>	.30	1.32	.55	.33	.88	.28	.43
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	.15	-	.66	.38	.40	.56	.41
B	<i>Garrya flavescens</i>	-	1.00	1.48	.78	.81	1.93	2.28
B	<i>Gutierrezia sarothrae</i>	-	.18	-	-	-	.16	-
B	<i>Juniperus osteosperma</i>	.78	1.85	4.56	.97	8.00	6.73	7.43
B	<i>Opuntia</i> sp.	.15	.15	-	-	-	-	-
B	<i>Pinus edulis</i>	2.99	3.12	3.00	3.40	3.98	5.10	7.41
B	<i>Purshia tridentata</i>	5.40	3.85	5.18	5.14	5.10	6.76	9.31
B	<i>Quercus turbinella</i>	.39	1.61	1.48	2.01	1.53	1.15	1.11
B	<i>Tetradymia canescens</i>	.03	.03	.03	-	-	.16	-
Total for Browse		31.87	30.54	34.98	26.10	38.42	41.27	50.51

POINT-QUARTER TREE DATA--

Management unit 30, Study no: 3

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	31	40	32	29
Purshia tridentata	26	28	31	35

Average diameter (in)			
'98	'03	'08	'13
7.2	5.4	7.9	4.5
8.2	7.0	7.1	5.2

BASIC COVER--

Management unit 30, Study no: 3

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	50.71	44.51	43.36	46.36
Rock	27.54	20.96	21.55	16.93
Pavement	5.34	3.90	6.08	2.23
Litter	45.96	47.71	43.67	52.04
Cryptogams	.03	0	.00	0
Bare Ground	7.44	8.52	11.37	6.88

PELLET GROUP DATA--

Management unit 30, Study no: 3

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	29	10	38	8
Deer	59	32	38	24

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
110 (271)	87 (215)	160 (395)	68 (167)

BROWSE CHARACTERISTICS--

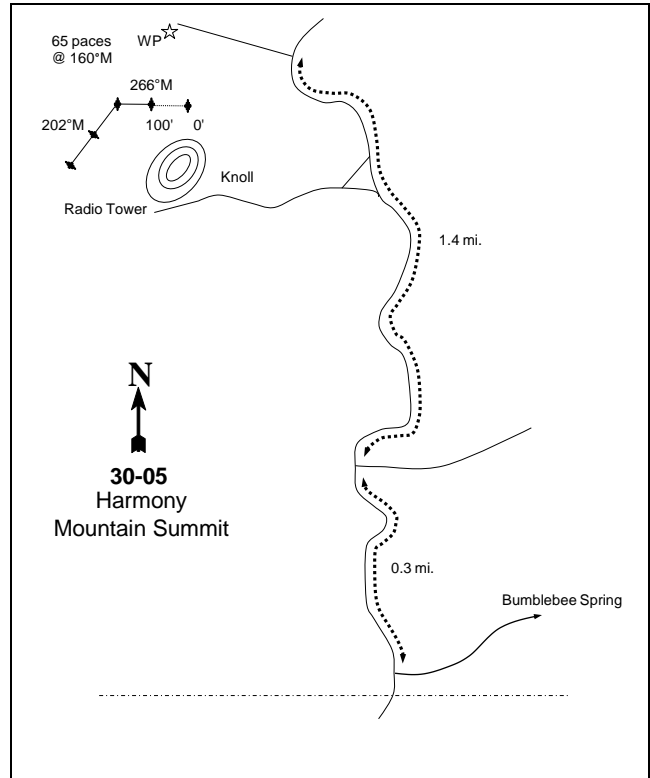
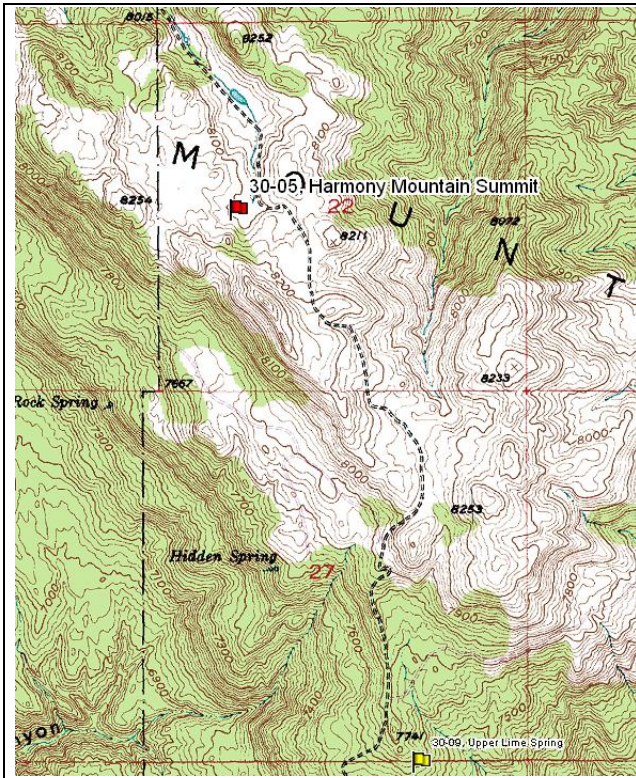
Management unit 30, Study no: 3

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
98	<b>1880</b>	16	79	5	320	27	2	2	50/55
03	<b>740</b>	30	68	3	20	32	11	0	51/72
08	<b>740</b>	27	59	14	180	8	3	0	50/65
13	<b>1160</b>	28	72	0	60	22	5	7	45/55
<b>Artemisia nova</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>40</b>	0	100	-	-	0	0	0	6/15
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Artemisia tridentata vaseyana</b>									
98	<b>2300</b>	16	60	24	120	24	.86	8	20/30
03	<b>1720</b>	6	58	36	-	10	0	15	21/30
08	<b>1700</b>	1	71	28	20	14	2	21	23/35
13	<b>1860</b>	17	62	20	40	13	13	20	21/33

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>Cercocarpus ledifolius</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	60/40
08	0	0	0	-	-	0	0	0	33/41
13	0	0	0	-	-	0	0	0	-/-
<i>Chrysothamnus nauseosus</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	16/24
<i>Chrysothamnus parryi</i>									
98	520	8	92	0	-	0	0	0	12/15
03	120	0	100	0	-	0	0	0	20/28
08	540	15	67	19	120	0	70	7	9/19
13	200	60	40	0	20	0	0	0	11/20
<i>Chrysothamnus viscidiflorus viscidiflorus</i>									
98	160	25	75	0	-	0	0	0	14/24
03	0	0	0	0	-	0	0	0	15/28
08	120	0	50	50	-	0	0	17	14/28
13	0	0	0	0	-	0	0	0	19/43
<i>Garrya flavescens</i>									
98	200	0	90	10	-	0	0	0	55/56
03	40	0	100	0	-	0	0	0	56/67
08	100	0	100	0	-	20	0	20	37/55
13	60	0	100	0	-	0	0	0	58/85
<i>Gutierrezia sarothrae</i>									
98	40	0	100	-	-	0	0	0	10/15
03	100	0	100	-	-	0	0	0	12/17
08	20	0	100	-	-	0	0	0	5/6
13	0	0	0	-	-	0	0	0	-/-
<i>Juniperus osteosperma</i>									
98	20	0	100	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	20	0	100	-	-	0	0	0	-/-
13	20	0	100	-	-	0	0	0	-/-
<i>Opuntia echinocarpa</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	24/38

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Opuntia</i> sp.										
98	<b>60</b>	0	100	0	-	0	0	0	5/11	
03	<b>100</b>	0	100	0	-	0	0	0	7/15	
08	<b>20</b>	0	0	100	-	0	0	100	5/9	
13	<b>40</b>	50	50	0	-	0	0	0	5/9	
<i>Pinus edulis</i>										
98	<b>60</b>	33	67	-	-	0	0	0	-/-	
03	<b>20</b>	0	100	-	20	0	0	0	-/-	
08	<b>40</b>	50	50	-	-	0	0	0	-/-	
13	<b>100</b>	40	60	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
98	<b>1320</b>	6	80	14	100	32	55	5	26/39	
03	<b>860</b>	12	79	9	20	44	30	7	27/50	
08	<b>780</b>	5	72	23	40	8	49	3	27/46	
13	<b>1260</b>	5	92	3	-	24	6	2	27/44	
<i>Quercus turbinella</i>										
98	<b>120</b>	50	50	-	-	0	0	0	36/40	
03	<b>40</b>	0	100	-	-	0	0	0	23/43	
08	<b>160</b>	63	38	-	180	0	0	0	21/19	
13	<b>60</b>	33	67	-	20	0	0	0	40/60	
<i>Tetradymia canescens</i>										
98	<b>20</b>	0	100	0	-	0	0	0	7/8	
03	<b>60</b>	0	67	33	-	0	0	0	13/13	
08	<b>120</b>	33	50	17	-	0	0	0	11/13	
13	<b>20</b>	0	100	0	-	0	0	0	14/19	

HARMONY MOUNTAIN SUMMIT - TREND STUDY NO. 30-5



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Stoddard Mountain; Township 37S, Range 13W, Section 22  
NAD 83, UTM Zone 12, 296479 East 4160026 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
266° magnetic (Lines 3 & 4: 202° magnetic)  
400ft  
Line 1 (12ft & 87ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
Belt 3: 1ft

**Directions to Site**

From the Dixie National Forest boundary north of New Harmony, proceed north 0.3 miles on Pace Draw Road. Turn right on Harmony Mountain Road and drive 1.0 miles, at which point you should come to a gate. From the fence continue on the main road 4.7 miles to a fork. Stay left and continue on the main road. At 0.3 miles stay left again and continue on the main road 1.4 miles to a fork. Continue left less that 0.1 miles to a witness post on the left (south) side of the road. From the witness post walk 65 paces at 160 degrees magnetic to the 0-foot stake. The study is marked by green steel fence posts approximately 18 to 24 inches in height.



**Site Information**

Land Ownership BLM  
 Allotment New Harmony  
 Elevation 8,110ft (2,472m)  
 Aspect Northeast  
 Slope 10-15%  
 Sample Dates 06/11/1982, 06/19/1992, 07/01/1998, 06/04/2003, 07/08/2008, 05/22/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

VEGETATION HISTORY--

Management unit 30, Study no: 5

Year	Vegetation Type <sup>1</sup>
1982-2013	Mountain Big Sagebrush/Low Rabbitbrush

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type)

**Site Notes**

Over the sample years, several deer have been seen near the site.

**Site Potential**

1981-2010 Average Annual Precipitation 21 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed Lithic Argiborolls  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

SOIL ANALYSIS DATA--

Management unit 30, Study no: 5

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	62.0	19.4	18.6	5.4	0.4	4.5	41.9	268.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site that does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1982, the site has been a mixed stand of mountain big sagebrush and stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*) with a moderately diverse herbaceous understory. Without disturbance sagebrush will likely increase on the site and become dominant.

**Trend Summary**

HERBACEOUS TRENDS--

Management unit 30, Study no: 5

T y p e	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron dasystachyum	-	-	-	7	-	-	-	.01
G	Agropyron trachycaulum	4	3	-	3	.09	.00	-	.03

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Bromus carinatus	b7	ab3	a-	ab1	.13	.06	-	.00
G	Carex sp.	12	5	3	15	.56	.41	.03	.82
G	Poa fendleriana	ab7	a4	ab11	b16	.21	.06	.34	.22
G	Poa pratensis	a22	a13	a22	b71	.55	.18	.41	.34
G	Stipa columbiana	ab241	b287	a223	ab245	5.40	4.10	3.76	2.64
G	Stipa comata	b119	a55	ab95	ab102	2.92	.99	1.90	1.78
G	Stipa lettermani	b298	a252	a222	ab275	10.28	6.90	8.37	8.30
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		710	622	576	735	20.17	12.73	14.83	14.18
Total for Grasses		710	622	576	735	20.17	12.73	14.83	14.18
F	Achillea millefolium	8	3	-	-	.18	.00	-	-
F	Agoseris glauca	c207	b185	a85	d297	3.87	2.25	.48	3.40
F	Astragalus newberryi	7	-	-	1	.18	-	-	.00
F	Astragalus sp.	2	-	-	-	.03	-	-	-
F	Calochortus nuttallii	2	2	-	8	.01	.01	-	.02
F	Castilleja linariaefolia	b25	a1	a4	a-	.27	.00	.00	-
F	Chenopodium fremontii (a)	32	28	19	37	.13	.10	.04	.08
F	Collinsia parviflora (a)	14	3	2	11	.13	.01	.00	.04
F	Crepis acuminata	c38	a-	a3	b23	.34	-	.00	.14
F	Delphinium nuttallianum	a1	b16	a-	b24	.03	.06	-	.15
F	Epilobium brachycarpum (a)	a3	a1	a-	b19	.00	.00	-	.03
F	Erigeron eatonii	1	8	4	6	.01	.07	.01	.02
F	Erigeron pumilus	2	2	-	8	.01	.00	-	.04
F	Eriogonum racemosum	ab13	a10	ab13	b18	.30	.07	.10	.21
F	Galium sp.	b14	a-	a-	ab6	.21	-	-	.04
F	Gayophytum ramosissimum(a)	-	3	7	-	-	.00	.03	-
F	Hackelia patens	29	20	18	30	.56	.58	.64	.50
F	Hydrophyllum occidentale	-	-	-	-	-	-	.00	-
F	Hymenoxys acaulis	6	-	-	-	.01	-	-	-
F	Lomatium sp.	1	7	-	-	.00	.01	-	-
F	Lupinus sericeus	b92	a35	b68	b80	3.59	.94	3.39	.68
F	Orogenia linearifolia	a-	a-	a-	b55	-	-	-	.19
F	Orthocarpus sp. (a)	a-	a-	b24	a1	-	-	.29	.00
F	Penstemon sp.	3	-	-	1	.03	-	.00	.03
F	Phacelia heterophylla	-	-	-	1	-	-	-	.00
F	Polygonum douglasii (a)	c174	a23	b83	ab61	.72	.05	.32	.12
F	Taraxacum officinale	17	18	9	16	.22	.17	.02	.16
Total for Annual Forbs		223	58	135	129	0.98	0.17	0.69	0.29
Total for Perennial Forbs		468	307	204	574	9.90	4.20	4.68	5.63
Total for Forbs		691	365	339	703	10.89	4.38	5.37	5.92

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

BROWSE TRENDS--

Management unit 30, Study no: 5

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	13.89	18.95	13.56	11.94	16.51	17.58	16.75
B	Cercocarpus montanus	-	-	-	.03	-	-	-
B	Chrysothamnus nauseosus	-	.03	-	-	-	-	-
B	Chrysothamnus parryi	-	.32	.72	.21	.46	2.46	.61
B	Chrysothamnus viscidiflorus viscidiflorus	23.36	19.12	21.97	16.46	22.05	30.28	21.36
B	Mahonia repens	.06	.01	-	.03	.10	-	.03
B	Populus tremuloides	.18	-	-	-	3.80	-	-
B	Symphoricarpos oreophilus	.18	.18	.33	.24	.91	1.36	1.58
Total for Browse		37.68	38.61	36.58	28.93	43.83	51.68	40.33

BASIC COVER--

Management unit 30, Study no: 5

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	60.90	53.04	58.31	60.20
Rock	2.23	1.72	1.69	1.72
Pavement	1.02	.90	4.48	.25
Litter	63.83	54.71	40.28	54.20
Bare Ground	8.60	9.82	7.96	8.45

PELLET GROUP DATA--

Management unit 30, Study no: 5

Type	Quadrat Frequency			
	'98	'03	'08	'13
Sheep	2	-	-	-
Rabbit	-	4	1	3
Grouse	-	-	2	-
Elk	-	-	-	1
Deer	44	50	28	32
Cattle	18	11	24	7

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
73 (180)	88 (217)	40 (99)	42 (103)
26 (64)	32 (79)	27 (66)	28 (68)

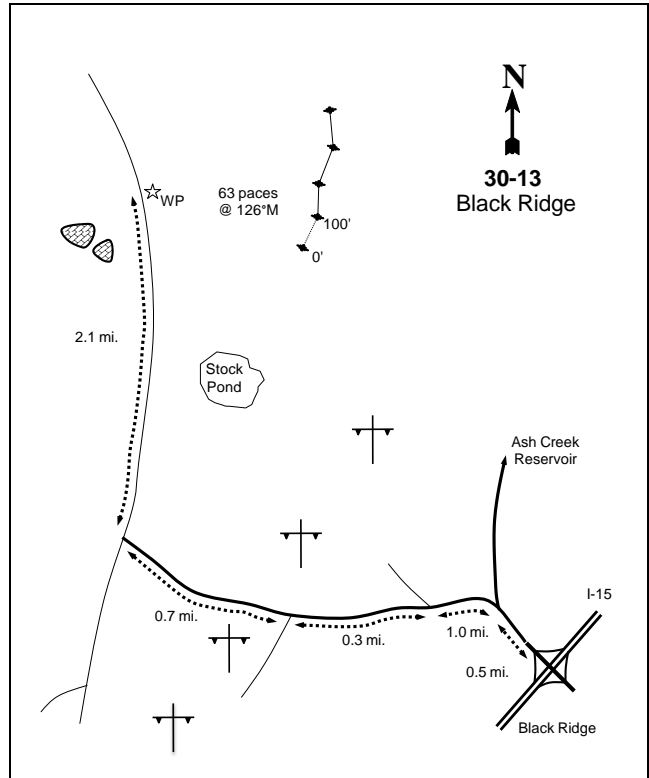
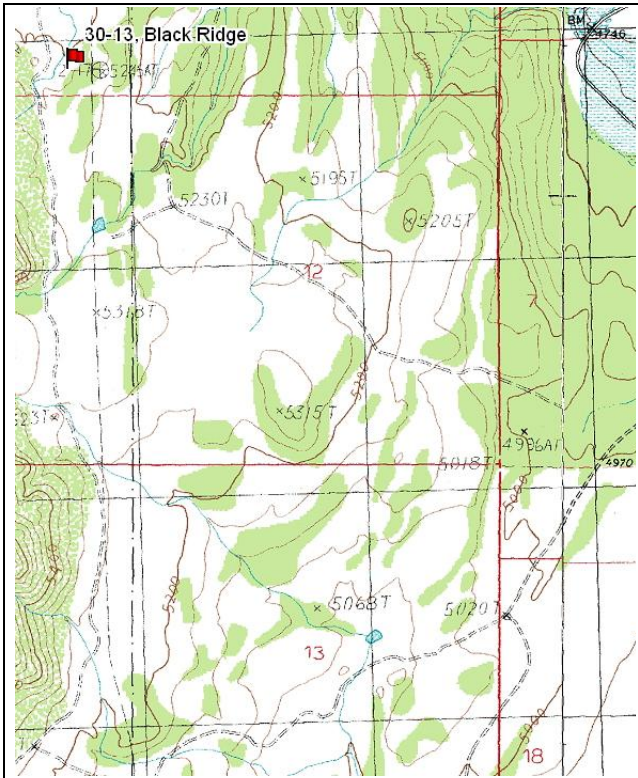
BROWSE CHARACTERISTICS--

Management unit 30, Study no: 5

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Amelanchier utahensis</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	16/19	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Artemisia tridentata vaseyana</b>										
98	6060	26	67	7	880	3	0	.33	16/24	
03	8640	29	66	5	340	15	5	2	15/24	
08	5820	3	71	25	260	16	.34	13	17/24	
13	3860	11	73	16	1520	20	3	20	16/25	
<b>Chrysothamnus parryi</b>										
98	0	0	0	0	-	0	0	0	-/-	
03	780	13	69	18	-	36	0	3	6/8	
08	1860	12	88	0	120	0	0	0	9/11	
13	360	44	50	6	-	0	0	6	10/8	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
98	11140	17	76	8	220	.35	0	0	13/21	
03	12100	14	81	5	-	.16	0	.16	11/18	
08	10280	2	94	4	100	2	0	.19	15/23	
13	7460	11	87	1	200	11	0	2	13/21	
<b>Mahonia repens</b>										
98	120	0	100	-	-	0	0	0	5/7	
03	140	0	100	-	-	0	0	0	2/3	
08	140	86	14	-	-	0	0	0	6/6	
13	200	0	100	-	-	0	0	0	3/6	
<b>Populus tremuloides</b>										
98	20	100	0	-	20	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Quercus gambelii</b>										
98	0	0	0	-	-	0	0	0	157/106	
03	0	0	0	-	-	0	0	0	16/15	
08	0	0	0	-	-	0	0	0	15/40	
13	0	0	0	-	-	0	0	0	-/-	
<b>Ribes viscosissimum</b>										
98	0	0	0	-	-	0	0	0	31/31	
03	0	0	0	-	-	0	0	0	47/48	
08	0	0	0	-	-	0	0	0	39/40	
13	60	100	0	-	-	0	0	0	25/37	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Symphoricarpos oreophilus										
98	<b>20</b>	0	100	-	-	100	0	0	25/51	
03	<b>60</b>	0	100	-	-	0	0	0	23/47	
08	<b>100</b>	40	60	-	-	0	0	0	22/48	
13	<b>200</b>	30	70	-	-	10	60	0	22/53	

BLACK RIDGE - TREND STUDY NO. 30-13



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

New Harmony; Township 39S, Range 13W, Section 2  
NAD 83, UTM Zone 12, 298667 East 4144077 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

7003  
2° magnetic (The transect doglegs at 200ft and 300ft stakes)  
400ft  
Line 1 (15ft & 84ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
No Rebar

**Directions to Site**

Traveling south on I-15 from Cedar City, take the Black Ridge exit (exit #36). Go west for a short distance to a frontage road. Turn north (right) on the frontage road and then take the first left turn onto Escalante's Path in the Kolob Estates heading west. Travel 0.5 miles and take a left turn onto a dirt road. Continue on this dirt road, keeping to the right at the fork. After approximately 1 mile, you will come to a corral. Stay to the left and continue on this road for 0.3 miles and turn right at the intersection at the power lines. Proceed on this road for another 0.7 miles, at which point there will be another intersection. Turn right at the intersection and travel 2.1 miles, then stop. On the left side of the road is a large rock outcrop. On the right side of the road is a witness post. The 0-foot baseline stake is located 63 paces at a bearing of 126 degrees magnetic from the witness post. The study is marked by green steel "T" fence posts approximately 18 to 24 inches in height. The 0-foot baseline stake is marked with a browse tag #7003.

**Site Information**

Land Ownership USFS  
 Allotment New Harmony  
 Elevation 5,200ft (1,585m)  
 Aspect Northwest  
 Slope 8-10%  
 Sample Dates 06/23/1982, 06/17/1992, 05/22/1998, 07/07/2003, 05/28/2008, 05/14/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 13

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 13

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982	Perennial Grass	Phase I
1992-1998	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2003-2013	Mountain Big Sagebrush/Pinyon-Juniper	Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

No remarks

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R028AY310UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 13

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	36.0	31.4	32.6	5.8	0.5	1.5	7.2	83.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1985, the site was in a seeded introduced perennial grass state. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), singleleaf pinyon pine (*Pinus monophylla*), and Utah juniper (*Juniperus osteosperma*) were a minor component of the site, but over the sample years these species have increased and become a dominant component of the site. Since study establishment, the site has transitioned to a mountain big sagebrush dominated state and is starting to transition to a pinyon and juniper dominated state (Table - Browse Trends; Table - Herbaceous Trends). Without disturbance, it is predicted pinyon and juniper trees will continue to increase on the site and become the dominant component of the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 30, 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
1998	21.9	12.2	14.6	21.3	-1.0	8.5	0.0	<b>77.6</b>	Good
2003	19.7	9.8	7.2	8.2	-0.2	3.2	0.0	<b>47.9</b>	Poor
2008	21.7	9.3	3.3	3.3	0.0	2.2	0.0	<b>39.7</b>	Poor
2013	22.2	10.1	10.9	5.2	-0.1	3.7	0.0	<b>51.9</b>	Poor-Fair

## HERBACEOUS TRENDS--

Management unit 30, Study no: 13

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	c219	b111	a49	a18	5.53	1.84	.40	.12
G	Agropyron intermedium	ab3	a-	b12	ab7	.03	-	.02	.21
G	Bromus tectorum (a)	c129	b54	a17	b65	1.32	.20	.04	.14
G	Elymus junceus	3	-	-	-	.03	-	-	-
G	Koeleria cristata	c69	b34	a-	b17	2.54	.43	-	.14
G	Poa fendleriana	ab63	b31	a46	a75	2.14	1.50	.51	1.87
G	Poa secunda	a4	a-	b50	a2	.06	-	.36	.00
G	Sitanion hystrix	a19	a7	b52	a33	.33	.33	.35	.21
G	Stipa columbiana	-	-	-	-	-	-	-	.00
G	Vulpia octoflora (a)	12	12	-	7	.05	.07	.00	.01
Total for Annual Grasses		141	66	17	72	1.37	0.27	0.04	0.16
Total for Perennial Grasses		380	183	209	152	10.67	4.11	1.65	2.58
Total for Grasses		521	249	226	224	12.05	4.39	1.70	2.74
F	Agoseris glauca	b19	a-	ab12	b21	.12	-	.02	.05
F	Arabis sp.	ab4	a-	a1	b16	.01	-	.00	.03
F	Aster sp.	6	3	9	12	.04	.03	.07	.07
F	Astragalus sp.	7	2	3	1	.09	.00	.03	.03
F	Balsamorhiza hookeri	-	-	-	3	-	.03	.03	.00
F	Calochortus nuttallii	ab20	a5	b31	a7	.05	.01	.07	.02
F	Cirsium calcareum	17	13	11	11	.49	.63	.07	.05
F	Collinsia parviflora (a)	a17	a7	a20	b57	.05	.01	.05	.13
F	Comandra pallida	-	2	-	-	-	.00	-	-
F	Cordylanthus sp. (a)	d86	c46	b16	a-	.56	.72	.11	-
F	Crepis acuminata	-	2	4	-	-	.15	.01	-
F	Descurainia pinnata (a)	-	3	-	-	-	.03	-	-
F	Draba sp. (a)	b31	ab13	a7	a4	.15	.03	.02	.01
F	Epilobium brachycarpum (a)	c32	a-	b9	ab7	.06	-	.02	.02
F	Erigeron pumilus	b36	a4	a-	b37	.24	.03	-	.51
F	Erigeron sp.	-	-	-	5	-	-	-	.01
F	Eriogonum racemosum	a-	b15	ab6	ab5	-	.07	.04	.01



Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Eriogonum umbellatum	ab45	a19	ab44	b66	.65	.13	.59	.59
F	Lithophragma sp.	-	-	5	-	-	-	.01	-
F	Lithospermum sp.	5	4	-	-	.03	.06	-	-
F	Lomatium sp.	7	10	5	11	.02	.02	.01	.02
F	Lotus utahensis	-	-	7	-	-	-	.04	-
F	Lupinus argenteus	b13	a-	a-	ab6	.19	-	-	.01
F	Melilotus officinalis	b65	a26	a3	a26	1.89	.33	.01	.10
F	Microsteris gracilis (a)	a13	c78	b43	ab29	.04	.63	.09	.06
F	Phlox longifolia	a6	a10	ab23	b32	.01	.04	.06	.06
F	Polygonum douglasii (a)	b14	a-	c34	b20	.03	-	.08	.04
F	Psoralea tenuiflora	a-	a-	a-	b41	-	-	-	.18
F	Ranunculus sp.	b57	a-	a-	a-	.22	-	-	-
F	Ranunculus testiculatus (a)	a-	a-	a1	b28	-	-	.00	.07
F	Sphaeralcea grossulariifolia	-	4	-	-	-	.00	-	-
F	Unknown forb-annual (a)	a-	a-	b43	a-	-	-	.13	-
F	Viguiera multiflora	5	-	-	-	.18	-	-	-
F	Zigadenus paniculatus	3	3	2	12	.01	.03	.00	.05
Total for Annual Forbs		193	147	173	145	0.90	1.43	0.52	0.33
Total for Perennial Forbs		315	122	166	312	4.27	1.61	1.09	1.85
Total for Forbs		508	269	339	457	5.18	3.05	1.62	2.19

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

#### BROWSE TRENDS--

Management unit 30, Study no: 13

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	1.08	1.54	1.19	2.21	1.41	2.75	2.68
B	Artemisia tridentata vaseyana	14.92	13.55	15.66	14.88	16.33	18.18	22.83
B	Gutierrezia sarothrae	1.74	.43	.10	.16	.35	.05	.01
B	Juniperus osteosperma	3.59	8.79	6.79	8.69	11.80	14.01	15.13
B	Opuntia sp.					.03	-	-
B	Pinus monophylla	-	-	-	.00	.63	.71	.80
B	Purshia tridentata	.15	-	.00	.00	.38	.50	.95
B	Quercus gambelii	1.42	.45	.33	.30	1.68	1.08	1.75
B	Quercus turbinella	.38	.53	.03	.15	-	.76	1.88
Total for Browse		23.30	25.29	24.12	26.42	32.61	38.04	46.03

#### POINT-QUARTER TREE DATA--

Management unit 30, Study no: 13

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	90	104	157	168
Pinus monophylla	6	<18	25	25

Average diameter (in)			
'98	'03	'08	'13
3.8	6.6	5.8	3.3
4.0	-	3.4	5.2

BASIC COVER--

Management unit 30, Study no: 13

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	36.18	30.42	25.81	33.35
Rock	40.43	35.96	36.71	33.43
Pavement	11.24	5.14	9.95	9.76
Litter	39.62	38.73	35.27	37.76
Cryptogams	.32	.19	.13	.30
Bare Ground	6.98	10.60	9.80	10.51

PELLET GROUP DATA--

Management unit 30, Study no: 13

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	12	12	72	10
Deer	17	4	27	3

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
21 (52)	19 (46)	31 (46)	7 (18)

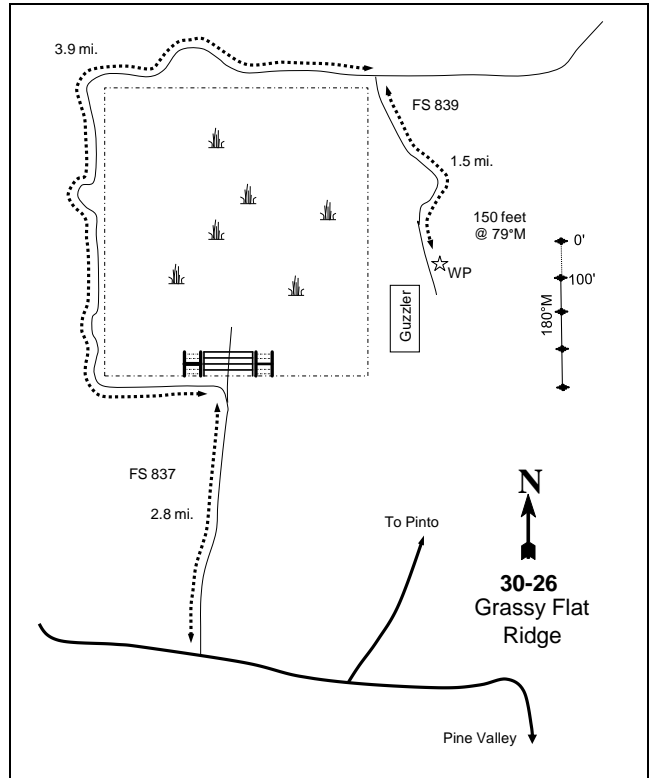
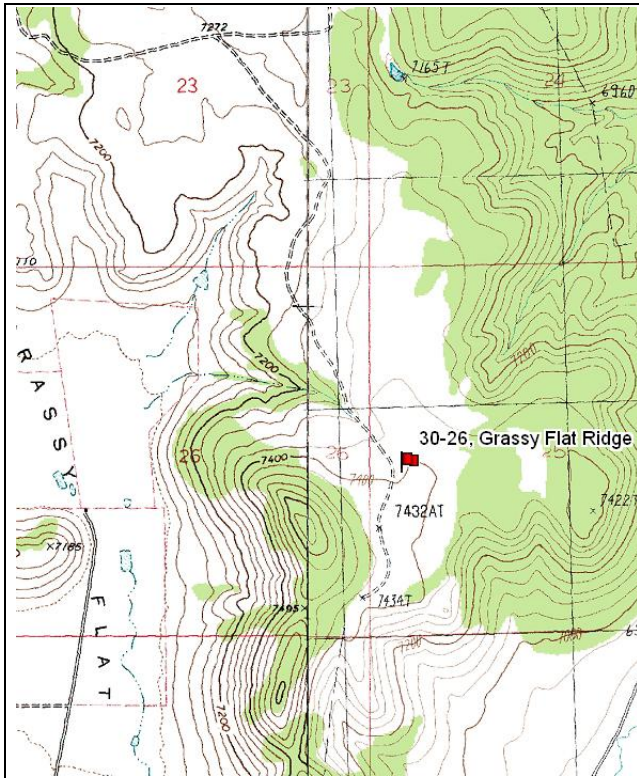
BROWSE CHARACTERISTICS--

Management unit 30, 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		
<b>Amelanchier utahensis</b>									
98	<b>1140</b>	33	67	0	-	2	0	0	41/45
03	<b>120</b>	33	50	17	-	17	0	0	47/53
08	<b>60</b>	0	100	0	140	0	0	0	48/55
13	<b>80</b>	25	75	0	-	0	0	0	48/59
<b>Artemisia tridentata vaseyana</b>									
98	<b>6080</b>	32	57	11	2360	12	0	7	19/31
03	<b>7120</b>	11	71	18	-	14	0	6	20/25
08	<b>6240</b>	6	73	21	500	34	3	9	20/31
13	<b>6060</b>	20	60	19	100	6	.33	8	15/31
<b>Cercocarpus montanus</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>20</b>	100	0	-	-	0	0	0	13/20
<b>Chrysothamnus nauseosus hololeucus</b>									
98	<b>40</b>	0	0	100	-	0	0	100	-/-
03	<b>0</b>	0	0	0	-	0	0	0	-/-
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Gutierrezia sarothrae</b>									
98	<b>3240</b>	15	82	2	-	0	0	.61	6/8
03	<b>1040</b>	2	87	12	-	0	0	6	8/8
08	<b>460</b>	26	70	4	60	0	0	4	6/5
13	<b>520</b>	19	81	0	20	0	0	0	6/7
<b>Juniperus osteosperma</b>									
98	<b>320</b>	38	63	0	-	0	0	0	-/-
03	<b>420</b>	19	71	10	-	0	0	0	-/-
08	<b>280</b>	36	64	0	60	0	0	0	-/-
13	<b>400</b>	10	90	0	20	0	0	5	-/-
<b>Opuntia sp.</b>									
98	<b>40</b>	0	100	-	-	0	0	0	4/3
03	<b>60</b>	0	100	-	-	0	0	0	6/9
08	<b>20</b>	0	100	-	-	0	0	0	6/12
13	<b>0</b>	0	0	-	-	0	0	0	4/15
<b>Pinus monophylla</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	20	0	0	0	-/-
13	<b>0</b>	0	0	-	20	0	0	0	-/-
<b>Purshia tridentata</b>									
98	<b>20</b>	0	100	-	-	100	0	0	12/100
03	<b>60</b>	0	100	-	-	0	67	0	16/34
08	<b>40</b>	0	100	-	-	0	50	0	21/48
13	<b>40</b>	0	100	-	-	0	50	50	24/64
<b>Quercus gambelii</b>									
98	<b>140</b>	0	100	-	-	0	0	0	60/41
03	<b>220</b>	55	45	-	-	0	0	0	39/24
08	<b>380</b>	58	42	-	-	0	0	0	43/35
13	<b>120</b>	83	17	-	20	0	0	0	31/21
<b>Quercus turbinella</b>									
98	<b>200</b>	0	100	-	-	0	0	0	61/28
03	<b>160</b>	0	100	-	-	0	0	0	62/11
08	<b>180</b>	0	100	-	20	0	0	0	67/26
13	<b>180</b>	11	89	-	-	0	0	0	20/28

GRASSY FLAT RIDGE - TREND STUDY NO. 30-26



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Grass Valley; Township 38S, Range 15W, Section 25  
NAD 83, UTM Zone 12, 279212 East 4147914 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

Not Available  
180° magnetic  
400ft  
Line 1 (16ft & 89ft), Line 2 (39ft), Line 3 (48ft), Line 4 (63ft)  
Belt 2: 1ft, Belt 3: 4ft

**Directions to Site**

From the town of Pine Valley, travel west towards Central 1.5 miles to the dirt road to Pinto. Continue west 0.75 miles to the Gray's Ranch-Grassy Flat Road on the north side (right) of the road. Go north on this road approximately 2.8 miles and turn left. From here, continue on the road for 3.9 miles to Forest Service road #839. Bear right (south) and travel 1.5 miles to a witness post on the left (east) side of the road. A large guzzler can be found further down the road on the right (west) side. From the witness post, the 0-foot stake is 150 feet away at 79 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.

**Site Information**

Land Ownership USFS  
 Allotment Pine Valley  
 Elevation 7,410ft (2,259m)  
 Aspect Northwest  
 Slope 5-10%  
 Sample Dates 06/28/1982, 07/06/1992, 06/30/1998, 05/28/2003, 05/28/2008, 05/29/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 26

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer

**VEGETATION HISTORY--**

Management unit 30, Study no: 26

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A guzzler is located about 200 yards to the southwest of the study site.

**Site Potential**

1981-2010 Average Annual Precipitation 21 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 26

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	36.0	31.4	32.6	5.8	0.5	1.5	7.2	83.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site that does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1982, the site has been a stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a diverse herbaceous understory. Over the sample years, sagebrush has increased in abundance on the site. Pinyon pine (*Pinus edulis*) has slowly increased in cover over the sample years, but is still considered a minor component of the site (Table - Browse Trends, Table - Browse Characteristics). Without disturbance pinyon pine will likely increase and become the dominant species of the site (USDA-NRCS, 2011).

## Trend Summary

### HERBACEOUS TRENDS--

Management unit 30, Study no: 26

T y p e	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	a5	a33	b63	a13	.06	.33	1.50	.30
G	Agropyron intermedium	a52	a30	b119	b96	3.02	.81	3.77	5.84
G	Agropyron smithii	a31	ab45	a28	b55	.21	.29	.79	.58
G	Bromus inermis	-	-	4	3	-	-	.15	.03
G	Bromus tectorum (a)	ab6	a-	ab5	b18	.15	-	.01	.03
G	Koeleria cristata	ab30	a11	a10	b30	.74	.05	.19	.44
G	Poa bulbosa	a14	b27	a-	b30	.33	.51	-	1.22
G	Poa fendleriana	c174	a77	b114	bc161	5.16	.55	2.38	3.13
G	Poa secunda	a4	ab8	c72	b27	.00	.15	.66	.38
G	Sitanion hystrix	b146	a33	a22	a31	2.67	.26	.39	.43
G	Stipa lettermani	c65	a21	ab37	ab33	1.72	.13	.60	.61
Total for Annual Grasses		6	0	5	18	0.15	0	0.01	0.03
Total for Perennial Grasses		521	285	469	479	13.94	3.10	10.46	12.98
Total for Grasses		527	285	474	497	14.09	3.10	10.47	13.01
F	Agoseris glauca	11	11	14	27	.05	.10	.08	.05
F	Allium acuminatum	b307	c363	a185	a165	2.50	6.21	.73	.42
F	Antennaria parvifolia	39	20	24	26	.71	.17	.16	.41
F	Arabis sp.	3	2	6	3	.01	.00	.02	.01
F	Artemisia ludoviciana	-	-	1	-	-	-	.00	-
F	Astragalus agrestis	15	-	-	4	.12	-	-	.18
F	Astragalus argophyllus	6	-	-	3	.04	-	-	.01
F	Astragalus sp.	-	2	1	-	-	.00	.03	-
F	Balsamorhiza sagittata	-	2	-	-	-	.03	-	-
F	Calochortus nuttallii	a12	b79	b57	a20	.05	.39	.27	.07
F	Castilleja linariaefolia	-	1	-	-	-	.00	-	-
F	Chenopodium leptophyllum(a)	-	-	5	-	-	-	.00	-
F	Cirsium wheeleri	7	-	-	-	.06	-	.00	-
F	Collinsia parviflora (a)	a68	ab74	b110	c155	.18	.35	.44	.48
F	Comandra pallida	-	7	-	-	-	.06	-	-
F	Crepis acuminata	3	4	-	3	.01	.00	-	.00
F	Delphinium nuttallianum	a-	b7	ab9	ab2	-	.03	.01	.00
F	Descurainia pinnata (a)	-	3	-	-	-	.15	-	-
F	Epilobium brachycarpum (a)	b30	a-	b29	c50	.10	-	.06	.11
F	Erigeron eatonii	7	2	-	-	.21	.01	-	-
F	Erigeron pumilus	b13	a4	a-	a4	.06	.01	-	.01
F	Eriogonum sp.	-	-	-	-	-	-	.00	-
F	Eriogonum umbellatum	b30	ab25	a7	ab11	.41	.07	.01	.05
F	Gayophytum ramosissimum(a)	-	4	6	2	-	.01	.01	.00
F	Ipomopsis aggregata	a-	a-	b21	a-	-	-	.04	-
F	Lappula occidentalis (a)	-	-	1	7	-	-	.00	.01
F	Lomatium sp.	a6	c107	b45	b62	.03	.67	.16	.23

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Lupinus argenteus	-	-	-	-	-	-	-	-
F	Machaeranthera canescens	-	2	1	2	-	.00	.03	.01
F	Microsteris gracilis (a)	a1	a-	b40	a9	.00	-	.11	.02
F	Penstemon sp.	-	-	2	3	-	-	.00	.00
F	Phlox longifolia	7	3	4	9	.03	.01	.02	.16
F	Polygonum douglasii (a)	b84	a12	c138	ab46	.21	.04	.37	.10
F	Ranunculus testiculatus (a)	-	8	1	4	-	.02	.00	.01
F	Sphaeralcea coccinea	a1	a-	b12	a1	.00	-	.03	.00
F	Streptanthus cordatus	-	-	-	2	-	-	-	.00
F	Taraxacum officinale	-	-	-	2	-	-	-	.00
F	Tragopogon dubius (a)	3	-	-	-	.00	-	-	-
F	Trifolium sp.	-	-	2	1	-	-	.00	.00
F	Zigadenus paniculatus	ab70	b101	a50	a48	.67	1.02	.65	.54
Total for Annual Forbs		186	101	330	273	0.51	0.57	1.01	0.75
Total for Perennial Forbs		537	742	441	398	5.00	8.81	2.29	2.21
Total for Forbs		723	843	771	671	5.51	9.39	3.30	2.96

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

#### BROWSE TRENDS--

Management unit 30, Study no: 26

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	1.54	1.52	.87	.59	2.36	.61	1.83
B	Artemisia tridentata vaseyana	9.16	14.67	16.11	13.00	17.23	20.38	19.16
B	Cercocarpus ledifolius	.15	.85	.85	.63	.46	-	.50
B	Cercocarpus montanus	-	-	.00	.21	-	.23	.43
B	Chrysothamnus depressus	.42	.10	.10	.07	.06	-	.16
B	Gutierrezia sarothrae	.39	.40	.67	.20	.46	.76	.10
B	Opuntia sp.	.31	.33	.56	.42	.86	1.31	.85
B	Pinus edulis	.38	.38	.63	.38	.26	.63	1.85
B	Purshia tridentata	4.09	1.97	.01	.24	1.46	.31	.81
B	Quercus gambelii	.56	.18	.03	.93	.80	.63	1.95
B	Tetradymia canescens	.03	-	-	-	-	-	-
Total for Browse		17.04	20.43	19.86	16.70	23.95	24.86	27.64

**BASIC COVER--**

Management unit 30, Study no: 26

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	37.62	35.23	33.04	39.34
Rock	35.28	36.71	31.49	27.24
Pavement	5.62	3.02	8.41	1.34
Litter	29.13	17.67	23.30	25.51
Cryptogams	.15	.06	.26	.19
Bare Ground	19.05	18.20	18.19	17.94

**PELLET GROUP DATA--**

Management unit 30, Study no: 26

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Sheep	2	-	-	-	-	-	-	-
Rabbit	3	1	29	1	-	-	-	-
Deer	31	16	24	10	32 (79)	52 (129)	57 (141)	8 (20)
Cattle	4	-	5	2	-	7 (18)	8 (20)	-

**BROWSE CHARACTERISTICS--**

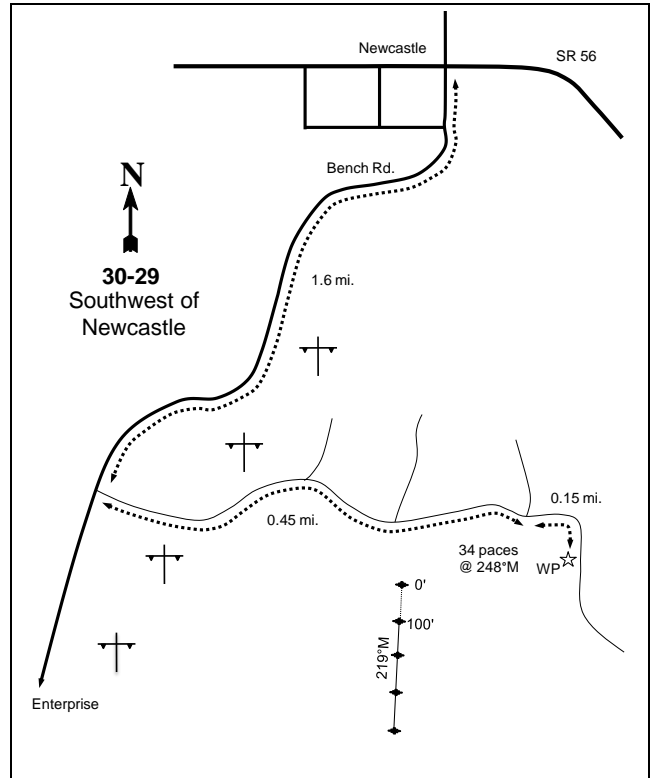
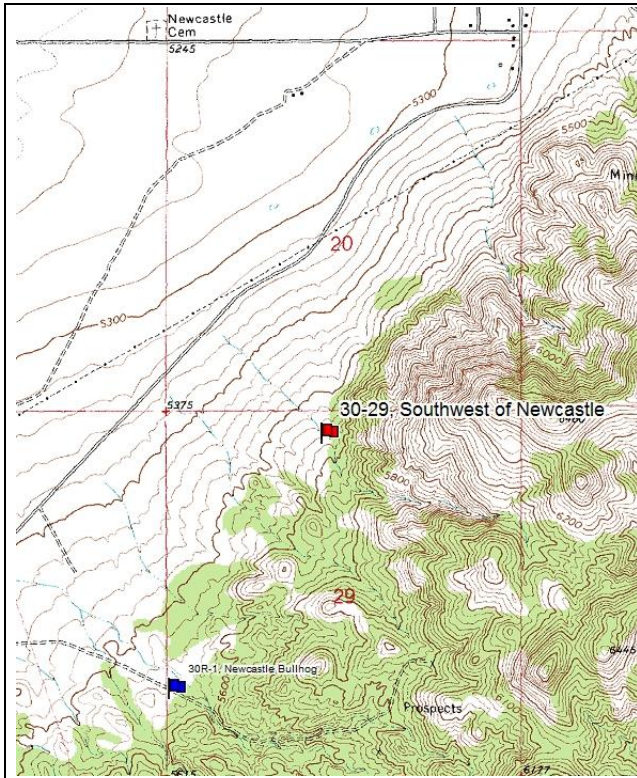
Management unit 30, Study no: 26

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
98	<b>380</b>	5	95	0	20	32	47	0	38/40
03	<b>360</b>	22	39	39	20	0	94	11	31/34
08	<b>220</b>	18	36	45	20	9	55	18	41/45
13	<b>280</b>	50	36	14	-	29	64	36	29/36
<b>Artemisia tridentata vaseyana</b>									
98	<b>7260</b>	43	53	4	1400	21	.82	4	24/26
03	<b>13440</b>	33	63	4	620	11	2	.74	12/21
08	<b>10380</b>	26	57	17	4960	34	4	6	11/22
13	<b>7020</b>	17	80	3	580	32	.56	2	13/24
<b>Cercocarpus ledifolius</b>									
98	<b>40</b>	0	100	0	-	0	50	0	44/50
03	<b>40</b>	50	50	0	-	0	50	0	60/44
08	<b>60</b>	67	33	0	-	0	33	0	52/39
13	<b>60</b>	33	33	33	-	33	33	0	51/50
<b>Cercocarpus montanus</b>									
98	<b>0</b>	0	0	0	-	0	0	0	-/-
03	<b>20</b>	0	100	0	-	100	0	0	-/-
08	<b>40</b>	0	100	0	-	100	0	0	35/35
13	<b>120</b>	0	50	50	40	0	100	33	34/38
<b>Chrysothamnus depressus</b>									



Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
98	<b>1680</b>	20	76	4	40	17	1	0	6/11
03	<b>560</b>	4	93	4	-	25	21	4	5/10
08	<b>180</b>	0	67	33	60	0	78	0	5/8
13	<b>380</b>	47	53	0	-	16	0	0	6/8
<i>Gutierrezia sarothrae</i>									
98	<b>2720</b>	32	68	0	-	2	1	0	7/6
03	<b>3060</b>	5	92	3	-	0	0	2	4/5
08	<b>5340</b>	7	89	4	400	.74	4	1	4/5
13	<b>500</b>	48	52	0	-	0	4	0	6/6
<i>Opuntia sp.</i>									
98	<b>380</b>	5	84	11	-	0	0	11	7/20
03	<b>420</b>	0	76	24	20	0	0	24	6/14
08	<b>380</b>	0	68	32	-	0	0	11	6/17
13	<b>360</b>	6	67	28	-	0	0	33	5/14
<i>Pediocactus simpsonii</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	-/-
13	<b>20</b>	0	100	-	-	0	0	0	2/3
<i>Pinus edulis</i>									
98	<b>40</b>	50	50	-	-	0	0	0	-/-
03	<b>60</b>	67	33	-	20	0	0	0	-/-
08	<b>80</b>	75	25	-	-	0	0	0	-/-
13	<b>40</b>	50	50	-	20	0	0	0	-/-
<i>Purshia tridentata</i>									
98	<b>700</b>	9	74	17	-	9	83	9	12/34
03	<b>580</b>	0	69	31	-	17	79	14	9/29
08	<b>400</b>	10	30	60	-	0	90	35	10/25
13	<b>280</b>	14	86	0	-	36	64	21	10/23
<i>Quercus gambelii</i>									
98	<b>460</b>	61	9	30	-	35	0	17	38/48
03	<b>1240</b>	92	8	0	-	0	0	0	42/48
08	<b>680</b>	0	82	18	-	0	0	35	60/12
13	<b>480</b>	83	17	0	-	0	0	0	27/48
<i>Tetradymia canescens</i>									
98	<b>100</b>	0	100	0	-	0	0	0	6/9
03	<b>0</b>	0	0	0	-	0	0	0	-/-
08	<b>40</b>	0	50	50	-	50	50	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-

SOUTHWEST OF NEW CASTLE - TREND STUDY NO. 30-29



**Location Information**

USGS 7.5 min Map Info Newcastle; Township Newcastle, Range 36S, Section 29  
 GPS (0' Stake) NAD 83, UTM Zone 12, 274236 East 4169617 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 176° magnetic  
 Length 400ft  
 Belt Placement Line 1 (12ft & 92ft), Line 2 (39ft), Line 3 (50ft), Line 4 (79ft)  
 Belt Marker Placement Standard

**Directions to Site**

From the intersection of Pinto-Canyon Road and Main Street in Newcastle, proceed south on Main Street 1.0 mile towards Enterprise. Turn left (east) and travel 0.45 miles until you come to a fork. Take a right and continue 0.15 miles to a witness post on the right side of the road. From the witness post walk 34 paces at 248 degrees magnetic to the 0-foot stake. The study is marked by green steel "T" fence posts approximately 18 to 24 inches in height.

**Site Information**

Land Ownership BLM  
 Allotment Pinto Creek  
 Elevation 5,580ft (1,701m)  
 Aspect West  
 Slope 11%  
 Sample Dates 06/29/1982, 07/02/1992, 05/19/1998, 05/21/2003, 05/15/2008, 05/28/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 29

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Lop and Scatter	-	-	2003	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 29

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Pictures were taken in 2004 following the lop and scatter treatment.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed, mesic Xeric Calciargids  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY220UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 29

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	54.0	21.4	24.6	6.4	0.6	1.6	9.4	105.6	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 1982, the site has remained in a stable state of Wyoming big sagebrush (*Artemisia tridentata* spp. *vaseyana*) with a limited herbaceous understory (Table - Browse Trends). The introduced annual grass species cheatgrass has fluctuated in abundance and has been a major component of the herbaceous understory over the sample years (Table - Herbaceous Trends). Singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) have been a minor component on the site over the sample years. A lop and scatter treatment following the 2003 sample year removed most of the pinyon and juniper trees on the study transect, although pinyon and juniper trees have remained the dominant component in the areas adjacent to the study site. Even though pinyon and juniper trees were removed, the site has the

potential to transition to a pinyon and juniper dominated state as evidenced by the increase in density of pinyon and juniper trees over the sample years even following the treatment (Table - Point Quarter Tree Data).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 30, study no: 29

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	14.5	5.1	1.0	18.0	-14.4	0.9	0.0	<b>25.2</b>	Poor-Fair
2003	8.3	-12.3	0.5	10.3	-0.1	0.3	0.0	<b>7.1</b>	Very Poor
2008	7.8	-1.3	7.5	16.6	-4.1	0.7	0.0	<b>27.2</b>	Fair
2013	11.0	10.5	6.4	8.3	-12.5	0.5	0.0	<b>24.2</b>	Poor-Fair

#### HERBACEOUS TRENDS--

Management unit 30, Study no: 29

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Bromus tectorum (a)	c462	a37	b420	c445	18.18	.09	5.43	16.67
G	Hilaria jamesii	ab165	ab168	b200	a139	b4.36	3.02	5.41	1.70
G	Oryzopsis hymenoides	32	20	30	23	1.47	.33	.49	.58
G	Poa secunda	bc94	c118	b66	a24	2.15	1.80	1.00	.36
G	Sitanion hystrix	b36	a1	bc69	c78	1.03	.00	1.38	1.50
G	Vulpia octoflora (a)	b163	a-	a7	a2	.98	-	.01	.01
Total for Annual Grasses		625	37	427	447	19.17	0.09	5.45	16.68
Total for Perennial Grasses		327	307	365	264	9.01	5.16	8.30	4.14
Total for Grasses		952	344	792	711	28.18	5.25	13.75	20.83
F	Arabis sp.	2	-	-	4	.03	-	-	.00
F	Astragalus newberryi	-	-	1	-	-	-	.03	-
F	Calochortus flexuosus	b17	b23	b14	a-	.04	.06	.04	-
F	Castilleja linariaefolia	a1	a-	b12	a2	.03	-	.08	.00
F	Collomia linearis (a)	3	-	-	-	.00	-	-	-
F	Cryptantha sp.	b33	a-	a9	a8	.19	-	.02	.15
F	Cymopterus sp.	ab9	a2	b17	a-	.02	.03	.06	-
F	Descurainia pinnata (a)	b25	a-	a-	a-	.08	-	-	-
F	Draba sp. (a)	b14	a-	a-	a-	.05	-	-	-
F	Eriastrum sparsiflorum (a)	-	-	-	8	-	-	-	.02
F	Erigeron pumilus	7	-	-	-	.02	-	-	-
F	Eriogonum cernuum (a)	-	-	3	-	-	-	.00	-
F	Eriogonum ovalifolium	2	-	-	-	.00	-	-	-
F	Gilia sp. (a)	b51	b28	b48	a4	.19	.36	.10	.01
F	Heterotheca villosa	-	-	1	-	-	-	.00	-
F	Lupinus argenteus	4	-	-	-	.01	-	-	-
F	Lupinus brevicaulis (a)	a-	a-	b9	a-	-	-	.02	-
F	Navarretia intertexta (a)	b39	b30	c186	a-	.07	.10	.37	-
F	Phlox longifolia	23	15	25	22	.08	.06	.09	.07

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Sisymbrium altissimum (a)	-	-	10	-	-	-	.04	-
F	Sphaeralcea grossulariifolia	-	-	-	2	-	-	.03	.00
F	Swertia albomarginata	1	-	-	-	.03	-	-	-
Total for Annual Forbs		132	58	256	12	0.41	0.46	0.55	0.03
Total for Perennial Forbs		99	40	79	38	0.45	0.15	0.35	0.24
Total for Forbs		231	98	335	50	0.87	0.62	0.91	0.27

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

#### BROWSE TRENDS--

Management unit 30, Study no: 29

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	11.61	6.51	6.20	8.50	1.55	8.83	10.33
B	Chrysothamnus viscidiflorus stenophyllus	1.56	2.56	3.65	4.46	1.28	4.13	5.75
B	Ephedra nevadensis	.00	.15	.03	.30	.03	.15	.61
B	Gutierrezia sarothrae	.15	-	.00	-	-	-	-
B	Opuntia whipplei	.91	.71	1.76	1.56	.86	1.51	1.81
B	Pinus monophylla	1.41	1.70	.66	1.01	1.55	.96	1.04
Total for Browse		15.66	11.63	12.32	15.83	5.27	15.58	19.54

#### POINT-QUARTER TREE DATA--

Management unit 30, Study no: 29

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	32	57	47	65	6.8	3.7	4.0	1.8
Pinus monophylla	26	31	32	29	2.3	3.2	0.9	1.1

#### BASIC COVER--

Management unit 30, Study no: 29

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	43.80	19.90	28.57	37.42
Rock	7.65	7.56	6.74	6.97
Pavement	22.60	31.62	23.55	18.16
Litter	30.99	35.59	50.99	44.94
Cryptogams	.39	.80	.17	.12
Bare Ground	18.28	12.09	7.30	8.17

PELLET GROUP DATA--

Management unit 30, Study no: 29

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	31	22	93	24
Elk	-	-	-	1
Deer	54	51	37	26
Cattle	-	-	-	3

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
68 (168)	58 (144)	102 (251)	57 (141)
-	-	-	1 (2)

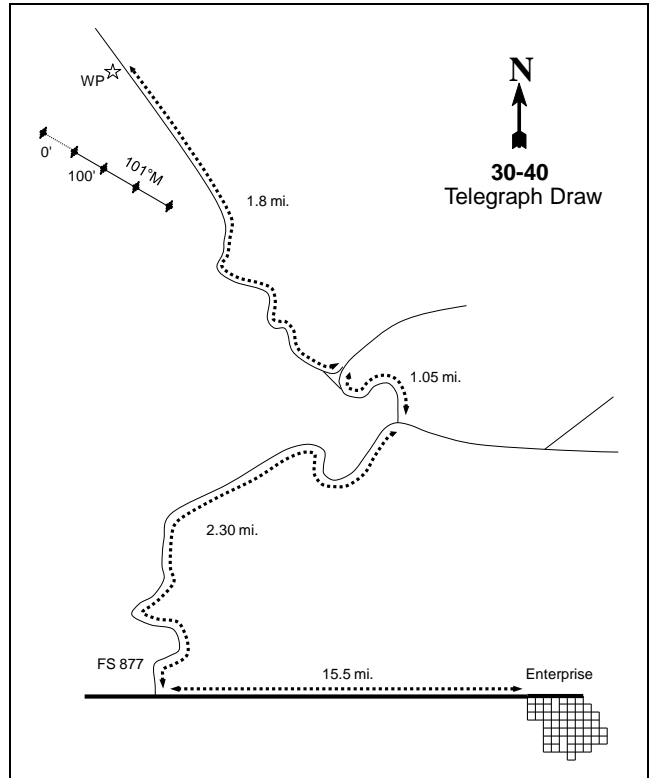
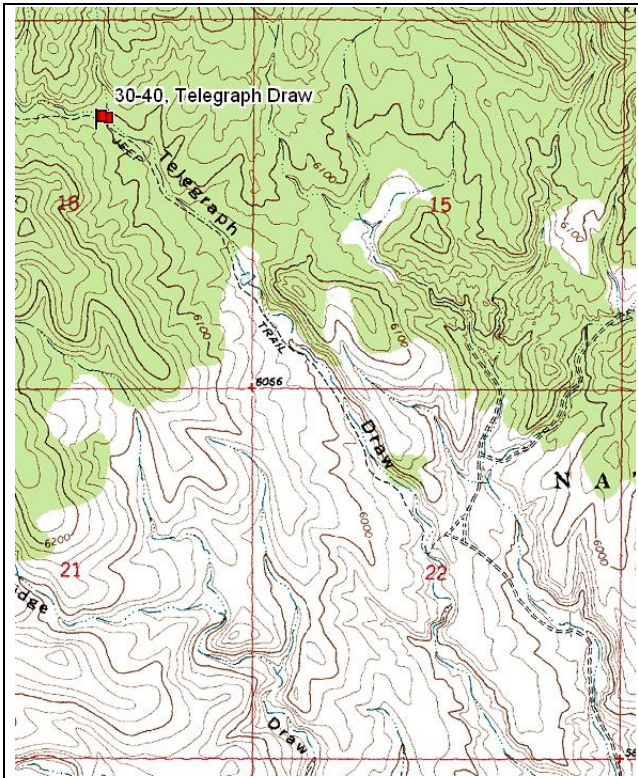
BROWSE CHARACTERISTICS--

Management unit 30, Study no: 29

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>									
98	<b>4860</b>	2	65	33	40	56	20	15	16/24
03	<b>3680</b>	1	6	93	40	9	85	91	13/20
08	<b>2660</b>	15	31	54	2640	37	11	21	15/23
13	<b>2480</b>	11	74	15	20	20	38	17	17/27
<i>Chrysothamnus viscidiflorus stenophyllus</i>									
98	<b>920</b>	7	93	0	-	0	0	0	12/18
03	<b>880</b>	2	34	64	-	0	2	41	10/13
08	<b>2160</b>	44	39	18	540	3	3	3	13/20
13	<b>1960</b>	27	68	5	-	0	2	3	14/23
<i>Ephedra nevadensis</i>									
98	<b>100</b>	20	80	0	-	80	0	0	10/21
03	<b>80</b>	0	100	0	-	0	25	25	8/12
08	<b>220</b>	0	0	100	-	0	91	36	18/24
13	<b>160</b>	63	25	13	20	13	0	25	17/34
<i>Gutierrezia sarothrae</i>									
98	<b>40</b>	0	100	-	20	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>20</b>	0	100	-	-	0	0	0	5/4
13	<b>0</b>	0	0	-	-	0	0	0	10/16
<i>Juniperus osteosperma</i>									
98	<b>40</b>	100	0	0	-	0	0	0	-/-
03	<b>80</b>	100	0	0	-	0	0	0	-/-
08	<b>40</b>	50	0	50	40	0	0	50	9/9
13	<b>40</b>	100	0	0	-	0	0	0	-/-
<i>Opuntia sp.</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	4/8

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Opuntia whipplei</b>										
98	<b>220</b>	9	91	0	-	0	0	0	7/13	
03	<b>200</b>	0	90	10	-	0	0	10	8/23	
08	<b>180</b>	0	78	22	-	11	0	11	10/28	
13	<b>160</b>	0	88	13	-	0	0	13	9/31	
<b>Pediocactus simpsonii</b>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>60</b>	0	100	-	-	0	0	0	1/3	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	-	0	0	0	2/3	
<b>Pinus monophylla</b>										
98	<b>20</b>	100	0	-	-	0	0	0	-/-	
03	<b>40</b>	100	0	-	-	0	0	50	-/-	
08	<b>20</b>	0	100	-	-	0	0	0	17/9	
13	<b>20</b>	100	0	-	-	0	0	0	-/-	
<b>Sclerocactus sp.</b>										
98	<b>20</b>	0	100	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	1/2	
08	<b>0</b>	0	0	-	-	0	0	0	2/2	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

TELEGRAPH DRAW - TREND STUDY NO. 30-40



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Mount Escalante; Township 36S, Range 19W, Section 16  
NAD 83, UTM Zone 12, 236896 East 4172114 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

287  
101° magnetic  
400ft  
Line 1 (14ft & 81ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
No Rebar

**Directions to Site**

From Center street and Main street in Enterprise, go west on the Shoal Creek road for 15.5 miles then turn right (north). Clover Valley road is 0.1 miles too far. Stay on the main road heading north for approximately 2.3 miles (at 1.3 miles, stay to the south of the wash; the north road is washed out). At this point, there will be a fork in the road. Go to the left (north) on F.S. road 1014 for approximately 1.05 miles to a triangle of roads at the top of the ridge. Stay to the left on the road that goes down into the draw for 1.8 miles, at which point the road enters pinyon-juniper. Just as you come to the pinyon-juniper, stop at the witness post on the left side of the road. The 0-foot baseline stake is located 49 paces from the witness post at 139 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The 0-foot stake is marked by browse tag #287.



**Site Information**

Land Ownership USFS  
 Allotment No Allotment  
 Elevation 6,100ft (1,859m)  
 Aspect Northwest  
 Slope 10%  
 Sample Dates 07/23/1982, 07/05/1992, 05/22/1998, 05/29/2003, 05/13/2008, 05/23/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 40

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 40

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982	Wyoming Big Sagebrush	Phase I
1992-1998	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II
2003-2013	Wyoming Big Sagebrush/Pinyon-Juniper	Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Several wild horses were seen during the 1992, 1998, and 2013 sample years, also wild horse sign (tracks and pellet groups) have been noted on the site over the sample years.

**Site Potential**

1981-2010 Average Annual Precipitation 17 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site [Upland Gravelly Loam \(Wyoming Big Sagebrush\)](#)  
 NRCS Ecological Site # R028AY307UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 40

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay	46.0	17.4	36.6	5.6	0.4	2.4	3.8	310.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

A defined [state and transition model](#) is available.

When established in 1982, the site was a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with young singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) trees scattered across the site (Community Phase 2.2). Since establishment of the study, pinyon and juniper trees have steadily increased in size and cover; and have become co-dominant on the site (Table - Point Quarter Tree Data, Table - Browse Trends)(Community Phase 3.1). The site has transitioned from the Current Potential State to the Utah Juniper/Invasive Plant State (Transition T2a). It is predicted that without a

disturbance such as fire or mechanical treatment, the site will transition to a pinyon and juniper dominated community with a sparse understory (Community Pathway 3.1a) (USDA-NRCS, 2011).

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 30, study no: 40

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	24.8	13.7	12.3	4.6	-1.9	10.0	0.0	<b>63.5</b>	Good-Excellent
2003	30.0	9.9	9.9	1.1	-0.3	5.7	0.0	<b>56.4</b>	Good
2008	25.8	4.4	6.6	2.7	-0.1	5.5	0.0	<b>44.9</b>	Fair-Good
2013	24.6	11.1	7.3	2.1	-1.7	7.2	0.0	<b>50.5</b>	Good

#### HERBACEOUS TRENDS--

Management unit 30, Study no: 40

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	a13	a19	b38	a6	.11	.25	.42	.06
G	Bromus tectorum (a)	b190	a87	a48	b193	2.52	.35	.15	2.31
G	Elymus junceus	-	-	-	1	-	-	-	.00
G	Hilaria jamesii	5	-	-	2	.03	-	-	.03
G	Oryzopsis hymenoides	c52	ab17	bc30	a6	1.05	.06	.20	.05
G	Poa fendleriana	b33	a7	a1	a10	.47	.04	.03	.22
G	Poa pratensis	-	-	-	4	-	-	-	.03
G	Poa secunda	2	-	3	3	.00	-	.00	.03
G	Sitanion hystrix	b47	a5	b38	b26	.57	.02	.47	.14
G	Stipa comata	a-	a-	b25	a1	-	-	.09	.00
G	Stipa coronata depauperata	6	-	3	-	.06	-	.01	-
G	Stipa lettermani	a-	c24	ab7	bc18	-	.16	.10	.45
Total for Annual Grasses		190	87	48	193	2.52	0.35	0.15	2.31
Total for Perennial Grasses		158	72	145	77	2.31	0.54	1.35	1.05
Total for Grasses		348	159	193	270	4.83	0.90	1.50	3.36
F	Agoseris glauca	-	-	1	-	-	-	.03	-
F	Allium sp.	1	-	-	-	.00	-	-	-
F	Alyssum alyssoides (a)	1	-	-	-	.00	-	-	-
F	Antennaria sp.	-	2	10	5	-	.00	.01	.06
F	Astragalus sp.	2	-	-	1	.03	-	.03	.00
F	Balsamorhiza hookeri	25	19	11	18	.57	.72	.39	.77
F	Calochortus nuttallii	-	-	6	-	-	-	.01	-
F	Chaenactis douglasii	b20	a-	a-	a4	.09	-	-	.03
F	Chenopodium album (a)	-	-	3	-	-	-	.38	-
F	Collinsia parviflora (a)	a6	a24	b38	a3	.02	.04	.09	.01
F	Comandra pallida	a32	b58	b64	b64	.24	.45	.36	.85
F	Crepis acuminata	-	1	3	-	-	.09	.00	-
F	Descurainia pinnata (a)	-	2	-	-	-	.00	-	-

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Erigeron sp.	3	-	-	-	.03	-	-	-
F	Eriogonum cernuum (a)	5	-	10	-	.06	-	.02	-
F	Eriogonum racemosum	b9	a-	ab5	ab7	.10	-	.07	.19
F	Eriogonum shockleyi	7	5	6	4	.16	.15	.06	.03
F	Eriogonum umbellatum	41	19	24	30	.29	.16	.26	.36
F	Gilia sp. (a)	6	-	-	-	.04	-	-	-
F	Hymenopappus filifolius	-	-	-	1	-	-	-	.00
F	Ipomopsis aggregata	-	-	4	3	-	-	.01	.00
F	Lappula occidentalis (a)	b12	b16	ab1	a-	.05	.03	.00	-
F	Lesquerella sp.	-	-	1	-	-	-	.00	-
F	Lomatium sp.	4	13	14	11	.04	.03	.06	.02
F	Lotus utahensis	3	-	1	-	.03	-	.00	-
F	Lupinus argenteus	4	2	3	-	.06	.00	.01	.03
F	Microsteris gracilis (a)	c87	ab6	a-	b23	.20	.01	-	.05
F	Orobanche fasciculata	-	1	-	-	-	.00	-	-
F	Penstemon caespitosus	-	-	9	2	-	-	.16	.00
F	Penstemon sp.	7	-	6	-	.07	-	.13	-
F	Petrorhiza pumila	57	39	32	30	1.42	.74	.59	.56
F	Phlox austromontana	b80	a34	a29	a46	1.62	.38	.36	.52
F	Phlox longifolia	ab7	ab7	b13	a-	.03	.04	.03	-
F	Polygonum douglasii (a)	-	1	-	-	-	.00	-	-
F	Ranunculus testiculatus (a)	-	-	2	-	-	-	.00	-
F	Senecio multilobatus	a-	a-	a2	b18	-	-	.00	.09
F	Sphaeralcea coccinea	-	-	-	2	-	-	-	.00
F	Streptanthus cordatus	b32	a-	a4	a-	.64	-	.03	-
F	Trifolium sp.	12	14	22	12	.06	.05	.09	.02
Total for Annual Forbs		117	49	54	26	0.38	0.09	0.50	0.06
Total for Perennial Forbs		346	214	270	258	5.53	2.87	2.77	3.59
Total for Forbs		463	263	324	284	5.91	2.97	3.27	3.66

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

#### BROWSE TRENDS--

Management unit 30, Study no: 40

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	14.61	21.35	14.10	14.75	16.96	18.21	20.46
B	Ceanothus greggii	-	.03	.06	-	.03	-	-
B	Chrysothamnus depressus	.44	.21	1.18	.25	.11	.11	.21
B	Chrysothamnus viscidiflorus	1.47	.57	.37	.28	.35	1.16	1.25
B	Gutierrezia sarothrae	.17	.28	.06	.03	.10	.06	-
B	Juniperus osteosperma	2.04	4.28	3.14	5.12	7.05	7.90	9.46
B	Opuntia sp.	-	-	.03	.01	-	-	-

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Pinus monophylla	5.69	4.85	6.30	4.33	7.76	10.96	12.83
B	Polygala subspinososa	-	.01	.02	.01	-	-	-
B	Purshia tridentata	3.97	6.86	4.49	3.89	7.18	5.60	7.63
Total for Browse		28.41	38.46	29.78	28.69	39.54	44.00	51.84

POINT-QUARTER TREE DATA--  
Management unit 30, Study no: 40

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	56	59	57	62	3.9	6.4	9.0	5.2
Pinus monophylla	161	122	168	137	2.5	3.3	2.6	4.8

BASIC COVER--  
Management unit 30, Study no: 40

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	39.52	39.01	34.21	37.07
Rock	10.70	8.96	11.21	10.76
Pavement	13.13	8.37	11.06	10.01
Litter	51.14	44.97	52.31	55.06
Cryptogams	.17	.07	.33	.04
Bare Ground	20.32	17.92	12.89	14.90

PELLET GROUP DATA--  
Management unit 30, Study no: 40

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	8	2	59	-	-	-	-	-
Horse	3	4	3	2	16 (40)	9 (23)	5 (12)	5 (13)
Deer	9	3	9	1	21 (52)	4 (10)	6 (15)	1 (2)

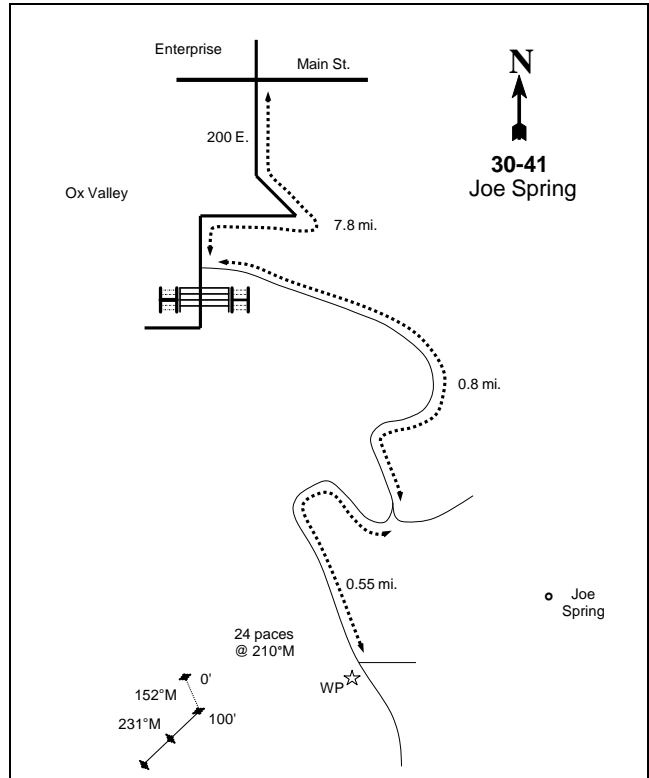
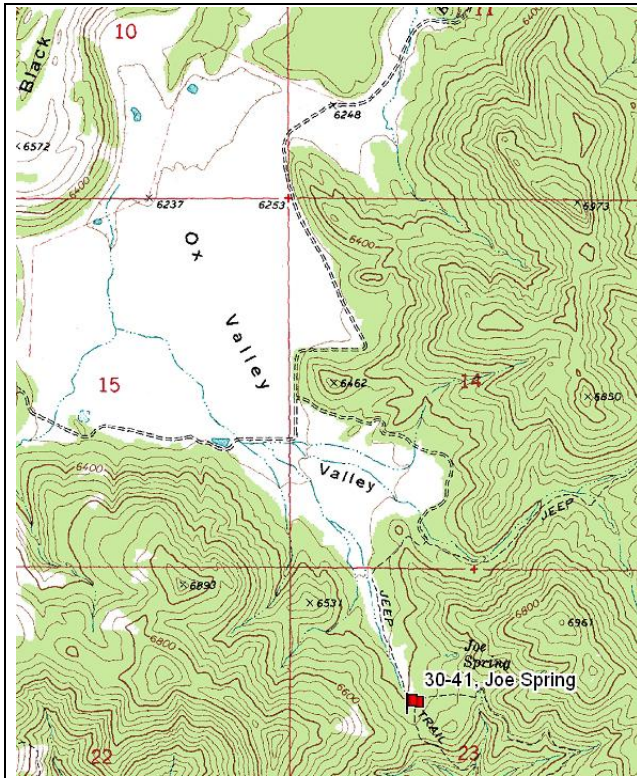
BROWSE CHARACTERISTICS--  
Management unit 30, Study no: 40

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
		Artemisia tridentata wyomingensis								
98	<b>4560</b>	25	72	4	1260	29	1	1	19/29	
03	<b>6740</b>	18	68	15	40	0	0	5	20/27	
08	<b>8160</b>	12	56	33	1120	4	1	8	17/25	
13	<b>5160</b>	16	72	12	340	10	0	9	20/29	

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Ceanothus greggii</b>									
98	0	0	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	100	0	5/12
08	0	0	0	-	-	0	0	0	11/39
13	0	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus depressus</b>									
98	2300	28	70	3	220	0	0	3	4/6
03	280	7	86	7	20	7	14	0	4/6
08	1080	28	67	6	140	24	28	2	3/5
13	300	13	87	0	-	0	0	0	3/6
<b>Chrysothamnus nauseosus</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	5/8
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<b>Chrysothamnus viscidiflorus</b>									
98	1360	19	76	4	-	0	0	1	11/16
03	520	15	65	19	-	0	4	12	13/18
08	920	4	78	17	40	2	30	7	8/10
13	680	12	88	0	40	0	0	6	11/15
<b>Gutierrezia sarothrae</b>									
98	1420	21	77	1	580	0	0	1	6/10
03	720	14	86	0	-	0	0	0	5/6
08	440	5	86	9	40	41	14	0	4/4
13	60	0	100	0	-	0	0	0	6/6
<b>Juniperus osteosperma</b>									
98	140	29	71	-	-	0	0	0	-/-
03	220	36	64	-	-	0	0	0	-/-
08	140	29	71	-	-	0	0	0	-/-
13	160	13	88	-	-	0	0	13	-/-
<b>Opuntia sp.</b>									
98	0	0	0	0	-	0	0	0	-/-
03	20	0	100	0	-	0	100	0	7/16
08	20	0	0	100	-	0	0	0	5/13
13	60	67	33	0	-	0	0	0	4/1
<b>Pinus monophylla</b>									
98	380	63	37	0	60	0	0	0	-/-
03	400	65	30	5	40	0	0	5	-/-
08	360	56	39	6	60	0	0	6	-/-
13	280	64	36	0	40	7	0	21	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Polygala subspinosa subspinosa</i>										
98	<b>0</b>	0	0	0	-	0	0	0	-/-	
03	<b>140</b>	14	86	0	-	0	0	0	3/3	
08	<b>80</b>	0	100	0	-	25	0	0	2/3	
13	<b>60</b>	0	67	33	-	0	0	33	3/3	
<i>Purshia tridentata</i>										
98	<b>620</b>	23	71	6	240	48	16	0	34/49	
03	<b>860</b>	26	51	23	20	12	5	5	38/53	
08	<b>780</b>	13	36	51	-	10	3	28	27/37	
13	<b>900</b>	9	73	18	-	9	0	13	33/45	
<i>Ribes sp.</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	40/65	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	

JOE SPRING - TREND STUDY NO. 30-41



**Location Information**

USGS 7.5 min Map Info Central West; Township 38S, Range 17W, Section 23  
 GPS (0' Stake) NAD 83, UTM Zone 12, 258686 East 4150398 North

**Transect Information**

Browse Tag # (0' Stake) 7015  
 Transect Bearing 152° magnetic (Lines 2 & 3: 231° magnetic)  
 Length 300ft  
 Belt Placement Line 1 (1ft & 93ft), Line 2 (71ft), Line 3 (34ft & 59ft)  
 Belt Marker Placement Standard

**Directions to Site**

From 200 East and Main in Enterprise, travel southwest 7.8 miles to Ox Valley. Take a left at the ranch gate and continue east and south 0.8 miles to the next fork. Turn right on FS road 356 and travel 0.55 miles to the next fork at Joe Spring. From the intersection walk up the right fork 32 paces to a full-high marker post on the right side of the road. The 0-foot baseline is 24 paces at 210 degrees magnetic and is marked by browse tag #7015. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.

**Site Information**

Land Ownership USFS  
 Allotment Gunlock  
 Elevation 6,440ft (1,963m)  
 Aspect Northeast  
 Slope 15-24%  
 Sample Dates 07/23/1982, 07/06/1992, 05/27/1998, 06/05/2003, 05/29/2008, 05/21/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer

VEGETATION HISTORY--

Management unit 30, Study no: 41

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982-2013	Mixed Mountain Brush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

There is a water source and saltlick within a half mile of the site. Deer have been seen near the site over the sample years and it was noted in 1982 and 2008. Mormon crickets were abundant in 2003 and 2008; and were noted on the site in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 23 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R028AY431UT

SOIL ANALYSIS DATA--

Management unit 30, Study no: 41

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	68.0	17.4	14.6	5.7	0.4	1.8	15.0	150.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1982, the site has remained in a stable state of mixed mountain brush with Utah serviceberry (*Amelanchier utahensis*), mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and Gambel oak (*Quercus gambelii*) being the dominant species (Table - Browse Trends). The herbaceous understory has been diverse and in fair condition over the sample years. The introduced annual grass species (*Bromus tectorum*) has been a major component of the herbaceous understory over the sample years (Table - Herbaceous Trends).



## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 30, study no: 41

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	12.3	8.0	11.8	-9.2	10.0	0.0	<b>62.8</b>	Fair
2003	30.0	10.9	5.2	6.9	-11.5	10.0	0.0	<b>51.5</b>	Poor-Fair
2008	30.0	7.8	6.7	9.4	-8.2	10.0	0.0	<b>55.8</b>	Fair
2013	27.3	12.9	11.9	7.1	-2.7	10.0	0.0	<b>66.5</b>	Fair-Good

## HERBACEOUS TRENDS--

Management unit 30, Study no: 41

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron intermedium	a1	b23	c51	a4	.00	.32	.63	.00
G	Agropyron smithii	ab6	a-	b14	c77	.02	-	.07	.65
G	Agropyron spicatum	b12	ab1	a-	ab6	.19	.03	-	.01
G	Bouteloua gracilis	-	3	3	3	-	.06	.15	.03
G	Bromus carinatus	ab24	a3	b23	ab14	.37	.03	.40	.07
G	Bromus tectorum (a)	b342	b322	b318	a255	12.32	15.37	10.94	3.57
G	Koeleria cristata	a-	b54	a-	a3	-	.68	-	.01
G	Oryzopsis hymenoides	-	-	6	1	-	-	.06	.00
G	Poa fendleriana	b93	a55	b121	b119	4.46	1.70	3.33	2.68
G	Poa pratensis	10	-	-	5	.18	-	-	.03
G	Sitanion hystrix	a16	b32	a6	a4	.63	.64	.07	.03
G	Stipa comata	2	-	-	-	.03	-	-	-
Total for Annual Grasses		342	322	318	255	12.32	15.37	10.94	3.57
Total for Perennial Grasses		164	171	224	236	5.89	3.47	4.72	3.54
Total for Grasses		506	493	542	491	18.22	18.84	15.67	7.11
F	Agoseris glauca	b35	a9	ab17	a19	.29	.02	.15	.03
F	Allium sp.	c66	a-	a-	b27	.48	-	-	.04
F	Arabis sp.	6	-	4	2	.16	.00	.03	.01
F	Artemisia ludoviciana	3	5	5	8	.00	.06	.06	.09
F	Aster chilensis	b33	a-	a-	a-	.09	-	-	-
F	Astragalus argophyllus	b14	a-	ab5	ab10	.11	-	.01	.01
F	Balsamorhiza sagittata	34	27	35	33	2.40	5.38	3.90	4.42
F	Brodiaea pulchella	a-	a-	c36	b16	-	-	.12	.05
F	Calochortus nuttallii	b8	a-	ab3	ab3	.03	-	.01	.01
F	Chaenactis douglasii	-	-	2	-	-	-	.03	-
F	Collinsia parviflora (a)	c342	a114	a74	b218	6.48	1.16	.26	.93
F	Collomia linearis (a)	-	1	-	6	-	.00	-	.01
F	Comandra pallida	19	13	9	6	.16	.10	.10	.16
F	Crepis acuminata	b12	a-	a1	b23	.27	-	.00	.07
F	Cryptantha sp.	-	-	2	-	-	-	.00	-

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Cymopterus sp.	c38	a-	b15	a-	.32	-	.09	-
F	Epilobium brachycarpum (a)	-	2	-	-	-	.03	-	-
F	Erigeron eatonii	16	25	15	7	.35	.26	.29	.07
F	Erigeron sp.	b17	a2	a3	a1	.17	.00	.03	.00
F	Eriogonum racemosum	6	3	2	3	.21	.00	.03	.03
F	Eriogonum umbellatum	-	2	-	-	-	.00	-	-
F	Galium sp.	7	14	16	7	.01	.71	.12	.01
F	Gayophytum ramosissimum(a)	a-	a-	ab7	b11	-	-	.02	.02
F	Gilia sp. (a)	-	-	-	8	-	-	-	.21
F	Hackelia patens	b23	a-	a3	a1	.30	-	.01	.00
F	Hydrophyllum occidentale	-	3	-	5	-	.03	-	.21
F	Lappula occidentalis (a)	a-	ab5	c30	b14	-	.16	.15	.03
F	Linum lewisii	2	-	-	-	.15	-	-	-
F	Lomatium sp.	a1	a-	a-	b42	.03	-	-	.16
F	Lupinus argenteus	b31	ab17	a9	a15	1.29	1.52	.18	.20
F	Machaeranthera canescens	3	-	4	-	.00	-	.03	-
F	Microsteris gracilis (a)	a29	a12	a9	b71	.16	.13	.02	.28
F	Penstemon comarrhenus	-	-	-	4	-	-	-	.00
F	Penstemon confusus	ab4	a-	ab5	b9	.04	-	.09	.22
F	Phacelia heterophylla	7	-	1	3	.79	-	.00	.00
F	Phlox austromontana	b141	ab131	a119	ab126	6.41	2.81	3.67	2.80
F	Polygonum douglasii (a)	a-	a2	b23	b25	-	.00	.07	.05
F	Senecio multilobatus	a-	b15	a-	a-	-	.07	-	-
F	Sphaeralcea grossulariifolia	1	2	4	8	.03	.03	.04	.07
F	Stephanomeria tenuifolia	b11	a-	a-	a-	.12	-	-	-
F	Unknown forb-annual (a)	4	-	-	-	.09	-	-	-
F	Unknown forb-perennial	5	-	-	-	.03	-	-	-
F	Vicia americana	c112	ab30	a25	b58	2.21	.19	.17	.37
F	Viguiera multiflora	-	-	6	-	-	-	.06	-
Total for Annual Forbs		375	136	143	353	6.73	1.49	0.53	1.54
Total for Perennial Forbs		655	298	346	436	16.52	11.23	9.29	9.11
Total for Forbs		1030	434	489	789	23.25	12.73	9.82	10.66

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

#### BROWSE TRENDS--

Management unit 30, Study no: 41

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	8.55	7.09	8.37	5.69	7.60	9.66	8.53
B	Artemisia tridentata vaseyana	10.19	8.72	7.01	7.26	9.23	13.85	14.01
B	Chrysothamnus depressus	.03	-	-	-	1.85	3.00	2.03
B	Chrysothamnus viscidiflorus viscidiflorus	1.43	1.46	2.20	1.32	.16	.13	.15

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Eriogonum microthecum	-	.57	.06	.03	-	-	-
B	Opuntia sp.	.03	.15	.03	-	-	-	-
B	Quercus gambelii	10.29	10.94	8.88	9.51	13.93	13.66	17.03
B	Ribes sp.	.38	-	.38	.15	-	2.45	1.11
B	Symphoricarpos oreophilus	.33	.18	.15	.03	.28	.45	.43
B	Tetradymia canescens	.03	.03	.38	.00	-	-	-
Total for Browse		31.28	29.14	27.48	24.02	33.05	43.2	43.29

BASIC COVER--

Management unit 30, Study no: 41

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	59.19	56.87	48.65	47.54
Rock	7.60	7.54	6.97	7.01
Pavement	4.94	6.17	6.16	.91
Litter	46.80	35.79	40.07	46.60
Bare Ground	20.56	18.29	21.30	16.96

PELLET GROUP DATA--

Management unit 30, Study no: 41

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	3	3	29	1	-	-	-	-
Deer	29	11	37	19	39 (96)	32 (79)	44 (107)	46 (112)
Cattle	2	3	6	-	10 (25)	5 (13)	18 (45)	-

BROWSE CHARACTERISTICS--

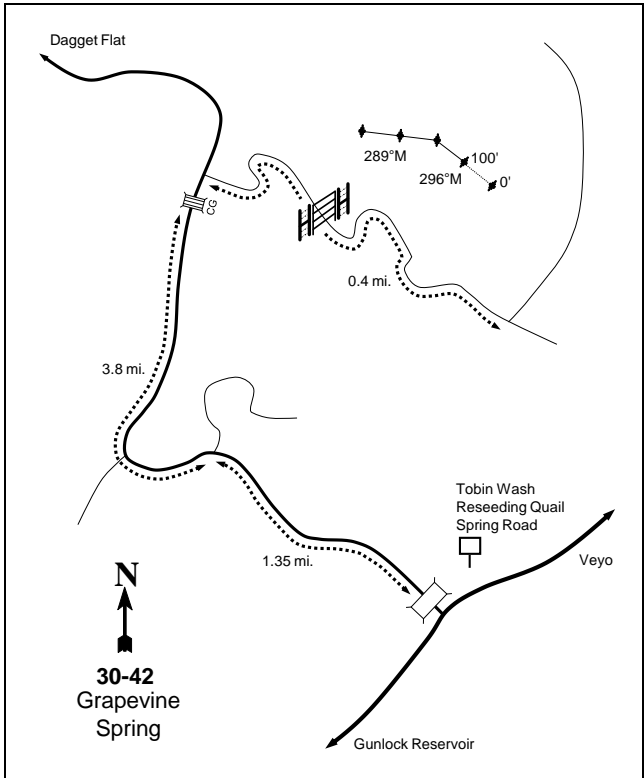
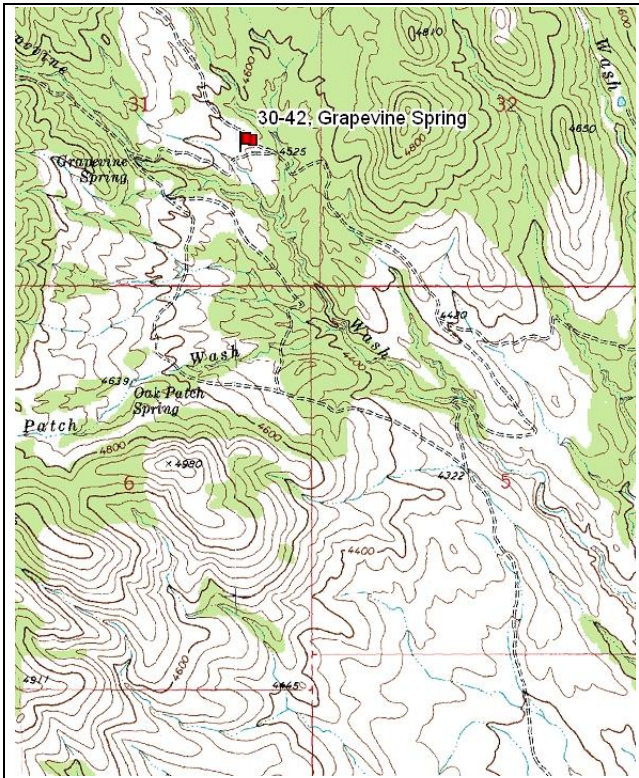
Management unit 30, Study no: 41

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
Amelanchier utahensis									
98	<b>4640</b>	1	93	6	-	51	13	0	45/33
03	<b>5480</b>	5	89	6	60	.72	36	3	47/47
08	<b>700</b>	9	71	20	200	26	60	6	47/50
13	<b>2140</b>	10	84	6	140	30	36	4	49/48
Artemisia tridentata vaseyana									
98	<b>2220</b>	21	67	13	500	29	5	3	22/33
03	<b>1980</b>	0	70	30	-	20	9	9	24/29
08	<b>1700</b>	11	58	32	60	27	18	15	21/33
13	<b>1780</b>	19	65	16	160	21	2	18	23/37

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Cercocarpus ledifolius</b>										
98	40	100	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	17/36	
13	0	0	0	-	-	0	0	0	-/-	
<b>Cercocarpus montanus</b>										
98	20	0	100	-	-	0	100	0	14/20	
03	0	0	0	-	-	0	0	0	22/29	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Chrysothamnus depressus</b>										
98	80	0	100	-	-	25	0	0	8/15	
03	0	0	0	-	-	0	0	0	-/-	
08	80	0	100	-	-	0	100	0	6/3	
13	0	0	0	-	-	0	0	0	-/-	
<b>Chrysothamnus viscidiflorus viscidiflorus</b>										
98	960	15	81	4	40	0	4	0	14/24	
03	700	3	94	3	-	0	0	0	14/18	
08	880	7	80	14	-	7	20	2	10/20	
13	780	23	74	3	-	0	0	0	10/16	
<b>Eriogonum microthecum</b>										
98	0	0	0	0	-	0	0	0	-/-	
03	180	11	89	0	-	11	0	0	7/16	
08	60	0	67	33	-	33	33	0	9/20	
13	0	0	0	0	-	0	0	0	9/21	
<b>Gutierrezia sarothrae</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	100	0	100	-	-	0	0	0	5/8	
13	0	0	0	-	-	0	0	0	-/-	
<b>Opuntia sp.</b>										
98	20	0	100	0	-	0	0	0	-/-	
03	20	0	100	0	-	0	0	0	3/20	
08	0	0	0	0	20	0	0	0	8/20	
13	20	0	0	100	-	0	0	100	8/18	
<b>Quercus gambelii</b>										
98	4920	24	68	8	340	6	0	29	35/31	
03	8720	22	72	6	20	18	1	.91	37/22	
08	7500	20	58	22	80	3	7	4	33/19	
13	5280	36	64	1	200	14	0	.75	31/19	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Quercus turbinella</b>										
98	<b>0</b>	0	0	-	-	0	0	0	35/20	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<b>Ribes sp.</b>										
98	<b>20</b>	0	100	-	-	0	0	0	57/58	
03	<b>20</b>	0	100	-	-	0	0	0	54/40	
08	<b>20</b>	0	100	-	-	0	0	0	45/51	
13	<b>40</b>	0	100	-	-	0	0	0	40/62	
<b>Symphoricarpos oreophilus</b>										
98	<b>560</b>	54	46	-	120	14	0	0	12/17	
03	<b>80</b>	0	100	-	-	0	0	0	20/41	
08	<b>100</b>	20	80	-	-	0	0	0	17/31	
13	<b>100</b>	0	100	-	-	0	0	0	10/17	
<b>Tetradymia canescens</b>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>80</b>	75	25	-	-	0	0	0	31/36	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>20</b>	0	100	-	-	0	0	0	6/20	

GRAPEVINE SPRING - TREND STUDY NO. 30-42



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Gunlock; Township 39S, Range 17W, Section 31  
NAD 83, UTM Zone 12, 252682 East 4137441 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

7098  
296° magnetic (line 3-4: 289°magnetic)  
400ft  
Line 1 (11ft & 92ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft)  
No Rebar

**Directions to Site**

Proceed west on Gunlock Road (center street) 5.7 miles from the town of Veyo until you come to a sign saying Tobin Wash and with Eagle Mountain Ranch. Turn right (west) at Eagle Mt. Ranch and travel 1.35 miles on the main road. Turn left, across a small creek, and proceed 3.8 miles to Grapevine Spring. Just past Grapevine Spring, take the fork to the right. Travel 0.40 miles till you come to another fork in the road to the left and stop. From the fork in the road, the 0-foot baseline stake is 10 paces away at a bearing of 296 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The baseline is marked with browse tag #7098.

**Site Information**

Land Ownership BLM  
 Allotment Twin Peaks  
 Elevation 4,530ft (1,381m)  
 Aspect East  
 Slope 5-10%  
 Sample Dates 07/24/1982, 07/17/1992, 05/26/1998, 05/22/2003, 05/14/2008, 05/21/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 42

<i>Treatment/Disturbance</i>	<i>Name</i>	<i>WRI DB #</i>	<i>Date</i>	<i>Size (acres)</i>
Chaining	-	-	Historic	-
Fire	Bull Complex	-	2006	41,500
Seeding	-	-	2006	-

The table is a recorded disturbance history of the study site.

**SEED MIX - BULL COMPLEX FIRE**

Management unit 30, Study no: 42

Project Name: Bull Complex Fire		
Application: Aerial		
Seed type	lbs/acre	
G	Pubescent Wheatgrass	3.0
G	Hycrest Wheatgrass	1.0
G	Sideoats Grama	2.0
G	Smooth Brome	1.0
F	Small Burnett	1.0
F	Alfalfa	1.0
F	Palmer Penstemon	0.1
F	Yellow Sweet Clover	0.5
B	Prostrate Kochia	1.0

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 42

<i>Year</i>	<i>Vegetation Type<sup>1</sup></i>	<i>Woodland Succession<sup>2</sup></i>
1982-1992	Mountain Big Sagebrush/Chaparral	Phase I
1998-2003	Mountain Big Sagebrush/Chaparral/Pinyon-Juniper	Phase I transitioning to Phase II
2008	Annual-Perennial Forb/Broom Snakeweed	Phase I
2013	Broom Snakeweed/Chaparral	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The seeding mentioned above is not part of the WRI data base and was likely applied independently by the Bureau of Land Management (BLM). Deer pellet groups were sampled in moderate abundance in 1998 and 2003, but has been sampled in low abundance since the Bull Complex fire in 2006 (Table - Pellet Group Data). In 2013, deer tracks were observed in a nearby wash. Rabbits and grasshoppers were also common on the site.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Upland Stony Loam (Shrub Liveoak)  
 NRCS Ecological Site # R029XY330UT

SOIL ANALYSIS DATA--

Management unit 30, Study no: 42

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	48.0	25.4	26.6	6.7	0.6	1.8	8.5	108.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions

No state and transition model is available for the above ecological site.

When established in 1982, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) was common and likely dominant on the site. Utah juniper (*Juniperus osteosperma*) and singleleaf pinyon pine (*Pinus monophylla*) were a sparse component of the over-story, and was considered to be in Phase I in woodland succession in 1982. From 1982 to 2003 the site experienced a period of pinyon-juniper encroachment and was transitioning to a Phase II woodland successional stage. Since the Bull Complex fire in 2006, much of the mountain big sagebrush was removed from the site, but is slowly returning with desert ceanothus (*Ceanothus greggii*) (Table - Browse Trends; Table - Herbaceous Trends). However, live oak (*Quercus turbinella*) has become the dominant species on the site. The invasive annual grass cheatgrass (*Bromus tectorum*) has remained a dominant component of the understory since 1998, and was likely prominent prior to 1998.

Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 30, study no: 42

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	30.0	11.4	9.5	2.4	-1.1	10.0	0.0	<b>62.2</b>	Fair
2003	15.9	2.6	2.7	0.0	-0.8	1.6	0.0	<b>22.0</b>	Very Poor
2008	0.0	0.0	0.0	0.3	-1.4	10.0	0.0	<b>9.0</b>	Very Poor
2013	0.0	0.0	0.0	0.1	-0.2	6.0	0.0	<b>5.9</b>	Very Poor

HERBACEOUS TRENDS--

Management unit 30, Study no: 42

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	6	-	3	-	.15	-	.00	-
G	Agropyron intermedium	11	-	-	-	.07	-	-	-
G	Bouteloua curtipendula	-	-	7	3	-	-	.09	.01
G	Bromus rubens (a)	12	7	18	14	.37	.20	.13	.03
G	Bromus tectorum (a)	<sub>b</sub> 138	<sub>a</sub> 36	<sub>b</sub> 115	<sub>b</sub> 121	1.03	.72	1.62	.28
G	Sitanion hystrix	<sub>b</sub> 53	<sub>a</sub> 3	<sub>a</sub> 12	<sub>a</sub> 4	.96	.03	.05	.04
G	Vulpia octoflora (a)	<sub>b</sub> 14	<sub>bc</sub> 27	<sub>c</sub> 25	<sub>a</sub> -	.02	.11	.07	-
Total for Annual Grasses		164	70	158	135	1.43	1.03	1.83	0.32
Total for Perennial Grasses		70	3	22	7	1.19	0.02	0.14	0.05
Total for Grasses		234	73	180	142	2.62	1.06	1.97	0.37
F	Agoseris glauca	-	1	-	-	-	.00	-	-



Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Calochortus flexuosus</i>	b17	a3	b30	a-	.04	.01	.08	-
F	<i>Castilleja linariaefolia</i>	2	6	-	-	.00	.01	-	-
F	<i>Cirsium</i> sp.	1	3	-	-	.00	.00	-	-
F	<i>Comandra pallida</i>	-	-	-	3	-	-	-	.06
F	<i>Dalea searlsiae</i>	b34	ab18	a9	ab14	3.85	.12	.75	.19
F	<i>Descurainia pinnata</i> (a)	a-	a1	b19	a1	-	.00	1.87	.00
F	<i>Draba</i> sp. (a)	c72	c84	b31	a-	.48	1.33	.10	-
F	<i>Eriogonum</i> sp.	a-	a4	b85	a-	-	.04	.45	-
F	<i>Erodium cicutarium</i> (a)	a-	a1	c79	b22	-	.15	7.43	.11
F	<i>Euphorbia</i> sp.	a29	a33	b103	b74	.28	.20	1.12	.34
F	<i>Frasera albomarginata</i>	b13	a-	ab4	a-	.25	-	.24	-
F	<i>Gilia</i> sp. (a)	a-	b13	b16	a-	-	.12	.07	-
F	<i>Lactuca serriola</i> (a)	a-	a-	b34	a-	-	-	.14	-
F	<i>Lomatium</i> sp.	1	-	-	-	.00	-	-	-
F	<i>Lotus plebeius</i>	b36	a8	a12	a1	.57	.01	.37	.06
F	<i>Medicago sativa</i>	-	-	1	-	-	-	.03	-
F	<i>Microsteris gracilis</i> (a)	3	-	-	-	.00	-	-	-
F	<i>Navarretia intertexta</i> (a)	a-	b32	c92	a-	-	.39	.54	-
F	<i>Nicotiana attenuata</i> (a)	a-	a-	b11	a-	-	-	.03	-
F	<i>Oenothera albicaulis</i> (a)	a-	a-	b14	a-	-	-	.03	-
F	<i>Penstemon humilis</i>	-	-	1	-	-	-	.00	-
F	<i>Penstemon palmeri</i>	-	-	2	1	-	-	.71	.15
F	<i>Penstemon</i> sp.	ab6	b12	c32	a-	.06	.05	.07	-
F	<i>Phacelia fremontii</i>	a-	a-	b40	a-	-	-	.35	-
F	<i>Phlox hoodii</i>	9	-	-	-	.33	-	-	-
F	<i>Salsola iberica</i> (a)	a-	a-	b21	a-	-	-	.05	-
F	<i>Sanguisorba minor</i>	a-	a-	a1	b18	-	-	.00	.27
F	<i>Senecio multilobatus</i>	-	-	4	-	-	-	.15	-
F	<i>Sisymbrium altissimum</i> (a)	-	-	6	-	-	-	.53	-
F	<i>Sphaeralcea grossulariifolia</i>	a-	a3	b27	c73	-	.16	5.68	1.22
F	<i>Swertia albomarginata</i>	-	-	-	4	-	-	-	.12
F	<i>Trifolium</i> sp.	-	-	2	-	-	-	.00	-
F	Unknown forb-annual (a)	-	11	-	-	-	.04	-	-
F	Unknown forb-perennial	4	5	-	-	.00	.12	-	-
F	<i>Verbena gooddingii</i>	a-	a-	b20	a-	-	-	1.04	-
F	<i>Viguiera multiflora</i>	a5	a3	a6	b29	.04	.03	.67	.58
Total for Annual Forbs		75	142	323	23	0.49	2.05	10.81	0.12
Total for Perennial Forbs		157	99	379	217	5.45	0.78	11.76	3.00
Total for Forbs		232	241	702	240	5.94	2.83	22.57	3.12

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

BROWSE TRENDS--

Management unit 30, Study no: 42

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	20.35	10.23	-	.03	8.48	-	-
B	Ceanothus greggii	-	1.29	.01	1.60	.83	-	4.60
B	Cowania mexicana stansburiana	3.59	2.09	-	-	3.30	-	-
B	Ephedra viridis	.15	-	-	-	-	-	-
B	Eriodictyon angustifolium	-	.83	.36	2.48	.60	1.63	1.03
B	Garrya flavescens	1.01	1.23	-	-	-	-	-
B	Gutierrezia sarothrae	2.54	.23	3.27	11.62	.08	7.56	16.36
B	Juniperus osteosperma	1.76	2.74	-	-	2.76	-	-
B	Kochia prostrata	-	-	.03	-	-	-	-
B	Pinus monophylla	.53	1.84	.00	-	2.30	-	-
B	Quercus turbinella	3.96	7.51	.58	5.91	8.80	1.11	6.93
B	Ribes sp.	-	-	.00	-	-	-	-
Total for Browse		33.90	28.02	4.28	21.65	27.15	10.3	28.92

POINT-QUARTER TREE DATA--

Management unit 30, Study no: 42

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	54	70	<18	<18	3.1	4.4	-	-
Pinus monophylla	47	52	<18	<18	2.6	3.6	-	-

BASIC COVER--

Management unit 30, Study no: 42

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	39.41	31.20	29.65	27.03
Rock	7.40	10.19	15.33	10.85
Pavement	22.61	18.88	30.05	16.00
Litter	45.50	46.26	5.45	40.09
Cryptogams	.05	.18	0	1.04
Bare Ground	28.76	12.70	32.65	18.51

PELLET GROUP DATA--

Management unit 30, Study no: 42

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	17	7	47	12	-	-	-	-
Deer	22	18	11	1	32 (79)	29 (73)	1 (3)	-
Cattle	1	-	-	-	2 (5)	-	-	7 (18)

BROWSE CHARACTERISTICS--

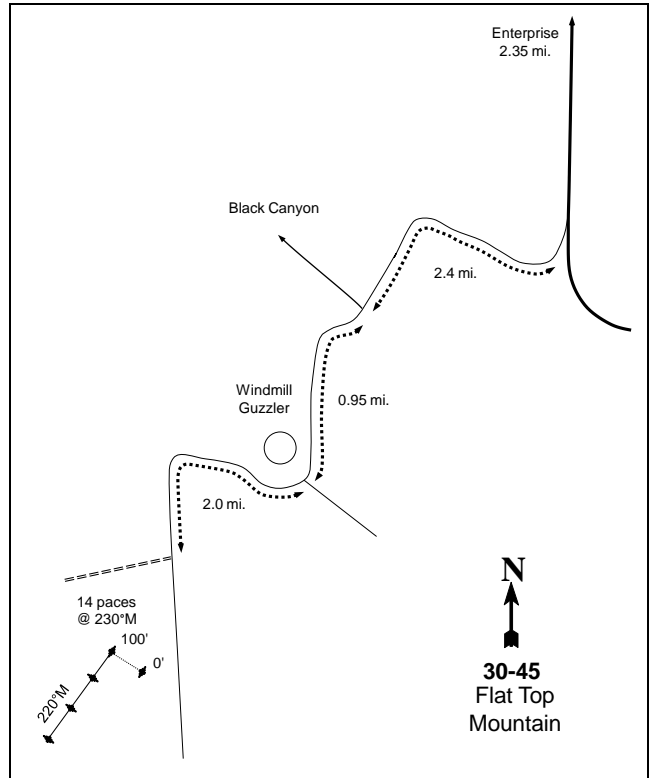
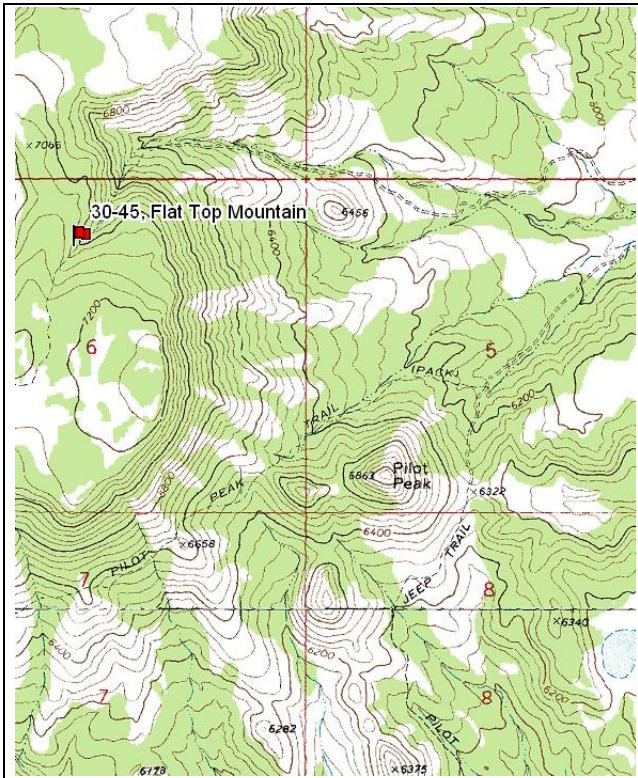
Management unit 30, Study no: 42

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata vaseyana</i>										
98	4380	17	80	2	1740	27	0	2	22/33	
03	2160	3	64	33	-	2	0	16	22/29	
08	20	100	0	0	-	0	0	0	15/16	
13	60	100	0	0	-	0	0	0	18/21	
<i>Ceanothus greggii</i>										
98	240	8	75	17	20	17	0	8	27/42	
03	120	0	50	50	-	17	0	33	27/41	
08	180	100	0	0	320	0	0	0	5/9	
13	280	14	86	0	-	0	7	14	17/25	
<i>Chrysothamnus viscidiflorus viscidiflorus</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Cowania mexicana stansburiana</i>										
98	260	31	69	-	60	38	0	0	58/71	
03	120	17	83	-	-	50	0	0	64/74	
08	0	0	0	-	-	0	0	0	15/37	
13	0	0	0	-	-	0	0	0	-/-	
<i>Ephedra nevadensis</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	21/42	
<i>Ephedra viridis</i>										
98	0	0	0	-	-	0	0	0	29/42	
03	0	0	0	-	-	0	0	0	27/31	
08	0	0	0	-	-	0	0	0	29/39	
13	0	0	0	-	-	0	0	0	51/76	
<i>Eriodictyon angustifolium</i>										
98	640	3	81	16	-	0	0	3	24/16	
03	320	6	44	50	-	44	13	25	17/15	
08	220	0	100	0	20	0	0	73	13/21	
13	1080	11	76	13	-	4	0	30	19/30	
<i>Garrya flavescens</i>										
98	40	0	100	0	-	0	50	0	22/31	
03	60	33	0	67	-	0	0	67	-/-	
08	0	0	0	0	-	0	0	0	-/-	
13	0	0	0	0	-	0	0	0	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Grayia spinosa</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
98	3080	19	71	10	880	0	1	7	8/10	
03	760	53	47	0	360	0	0	0	9/10	
08	5860	0	100	0	980	0	0	0	12/16	
13	7740	36	56	8	120	.25	0	11	12/21	
<i>Juniperus osteosperma</i>										
98	60	0	100	-	-	0	0	0	-/-	
03	100	40	60	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Kochia prostrata</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	80	75	25	-	-	0	25	0	2/6	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	0	0	0	-	-	0	0	0	6/13	
03	20	0	100	-	-	0	0	0	9/19	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Pinus monophylla</i>										
98	20	0	100	-	-	0	0	0	-/-	
03	60	0	100	-	-	0	0	0	-/-	
08	0	0	0	-	20	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	34/48	
<i>Quercus turbinella</i>										
98	460	4	96	0	60	0	0	0	55/68	
03	100	0	80	20	20	0	0	0	65/101	
08	780	10	90	0	-	0	0	100	31/35	
13	100	20	80	0	20	0	0	0	54/94	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Ribes sp.										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	20	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	

FLAT TOP MOUNTAIN - TREND STUDY NO. 30-45



**Location Information**

USGS 7.5 min Map Info Hebron; Township 38S, Range 17W, Section 06  
 GPS (0' Stake) NAD 83, UTM Zone 12, 252465 East 4155605 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 285° magnetic (line 2-4: 285° magnetic)  
 Length 400ft  
 Belt Placement Line 1 (11ft & 92ft), Line 2 (59ft), Line 3 (34ft), Line 4 (71ft)  
 Belt Marker Placement Belt 1: 8ft

**Directions to Site**

Go south on 200 East for 2.45 miles from the town of Enterprise, at which point there will be a fork in the road. Take a right and head towards Calf Springs. Stay on the main road for 2.3 miles until arriving at another fork in the road marked by the sign “Black Canyon.” Do not proceed towards Black Canyon. Take the left fork for 0.95 miles until arriving at another fork in the road. Take the right fork (F.S. Road 351) for 2.0 miles until the road turns into a steep jeep trail. Approximately 0.15 miles up the road from where it first becomes steep and rough will be an intersection (you can drive all the way to the intersection). Walk 14 paces at 230 degrees from the intersection. The 0-foot baseline stake is located 11 paces north of the road. The study is marked by green steel “T” fence posts approximately 12 to 18 inches in height.

**Site Information**

Land Ownership USFS  
 Allotment Black Hills  
 Elevation 7,020ft (2,140m)  
 Aspect East  
 Slope 5-25%  
 Sample Dates 08/25/1982, 08/27/1998, 06/04/2003, 05/29/2008, 05/21/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 45

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	Hawkins	-	2004	35,427

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Summer

**VEGETATION HISTORY--**

Management unit 30, Study no: 45

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982-2013	Gambel Oak	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

A browse tag needs to be placed on the 0-foot stake during the next sampling. Deer presence was likely high in 1982 due the high abundance of pellet groups and bedding areas (Jense, et al., 1982). Deer pellet groups have been sampled in high abundance in most sample years since 1998, but were sampled in low abundance in 2013 (Table - Pellet Group Data). In 2013, deer pellets were fresh and many of the game trails were active. Mormon crickets were observed on the site in 2003.

**Site Potential**

1981-2010 Average Annual Precipitation 28 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Gravelly Loam (Oak)  
 NRCS Ecological Site # R047XB410UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 45

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	38.0	37.4	24.6	5.6	0.6	5.2	52.1	435.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

From site establishment in 1982 to 2004, the site maintained stands of mature Gambel oak (*Quercus gambelii*) with a diverse understory dominated by the perennial forb, arrowleaf balsamroot (*Balsamorhiza sagittata*) (Table - Browse Trends; Table - Herbaceous Trends). In 2008, recruitment of Gambel oak was abundant following the wildfire, while maintaining dominance within the community; however, the high canopy cover produced by the oak was lost. Arrowleaf balsamroot has continued to maintain dominance within the

herbaceous community (Table - Browse Characteristics; Table - Herbaceous Trends). The invasive annual grass cheatgrass (*Bromus tectorum*) was observed for the first time in 2008 and likely found opportunity for range expansion following the wildfire. Cheatgrass has not exhibited significant increases in frequency or cover since 2008 and will likely remain that way if disturbance remains infrequent on the site, but may increase in dominance if the site experiences increased fire intervals.

### Trend Summary

#### HERBACEOUS TRENDS--

Management unit 30, Study no: 45

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Agropyron smithii</i>	a-	a-	a-	b32	-	-	-	1.66
G	<i>Bromus carinatus</i>	a-	ab9	b21	b21	-	.24	.77	.78
G	<i>Bromus tectorum</i> (a)	a-	a-	b39	c102	-	-	.74	2.56
G	<i>Poa fendleriana</i>	123	116	106	105	5.83	6.05	6.26	3.47
G	<i>Sitanion hystrix</i>	-	-	6	1	-	-	.09	.15
G	<i>Stipa lettermani</i>	-	6	3	3	-	.10	.01	.01
Total for Annual Grasses		0	0	39	102	0	0	0.74	2.56
Total for Perennial Grasses		123	131	136	162	5.83	6.40	7.13	6.08
Total for Grasses		123	131	175	264	5.83	6.40	7.87	8.64
F	<i>Agoseris glauca</i>	1	-	-	9	.00	-	-	.04
F	<i>Allium</i> sp.	b49	a7	a24	a8	.46	.02	.07	.01
F	<i>Arabis</i> sp.	a1	a7	b88	a13	.00	.04	1.85	.06
F	<i>Aster</i> sp.	b57	a-	a-	a-	1.05	-	-	-
F	<i>Astragalus</i> sp.	-	-	2	1	-	-	.00	.00
F	<i>Balsamorhiza sagittata</i>	b117	ab89	a63	a78	11.13	12.56	11.46	10.85
F	<i>Calochortus nuttallii</i>	1	-	2	2	.03	-	.00	.00
F	<i>Chenopodium fremontii</i> (a)	a-	a7	b47	a6	-	.01	.57	.04
F	<i>Collinsia parviflora</i> (a)	1	9	9	4	.00	.02	.02	.01
F	<i>Comandra pallida</i>	-	-	5	-	-	-	.00	-
F	<i>Conium maculatum</i>	-	5	3	-	-	.42	.15	-
F	<i>Crepis acuminata</i>	1	4	3	-	.00	.00	.03	-
F	<i>Cymopterus</i> sp.	9	-	-	-	.22	-	-	-
F	<i>Delphinium nuttallianum</i>	-	-	-	3	-	-	-	.00
F	<i>Erigeron eatonii</i>	-	-	16	7	-	-	.36	.01
F	<i>Galium</i> sp.	-	2	1	-	-	.00	.00	-
F	<i>Hydrophyllum occidentale</i>	b107	a46	a50	a64	6.29	.91	2.62	2.09
F	<i>Lappula occidentalis</i> (a)	-	-	2	-	-	-	.00	-
F	<i>Ligusticum porteri</i>	-	-	-	2	-	-	-	.38
F	<i>Lithophragma tenella</i>	-	-	5	-	-	-	.01	-
F	<i>Lupinus argenteus</i>	4	2	-	-	.15	.03	.03	.00
F	<i>Microsteris gracilis</i> (a)	b37	ab22	a1	c57	.15	.13	.00	.16
F	<i>Navarretia breweri</i> (a)	-	-	-	2	-	-	-	.00
F	<i>Nicotiana attenuata</i> (a)	-	-	3	-	-	-	.03	-
F	<i>Penstemon</i> sp.	-	-	1	-	-	-	.03	-
F	<i>Petradoria pumila</i>	8	7	-	3	.21	.24	-	.00



Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Phlox austromontana	10	4	2	2	.45	.04	.03	.03
F	Phlox longifolia	a <sup>-</sup>	ab <sup>3</sup>	a <sup>-</sup>	b <sup>15</sup>	-	.03	-	.07
F	Polygonum douglasii (a)	a <sup>-</sup>	a <sup>3</sup>	c <sup>21</sup>	b <sup>13</sup>	-	.00	.21	.02
F	Senecio multilobatus	10	13	2	2	.24	.11	.01	.01
F	Solidago missouriensis	a <sup>-</sup>	b <sup>35</sup>	b <sup>34</sup>	b <sup>47</sup>	-	1.42	1.59	1.80
F	Sphaeralcea grossulariifolia	a <sup>-</sup>	a <sup>-</sup>	b <sup>27</sup>	b <sup>27</sup>	-	-	1.37	.39
F	Stellaria jamesiana	c <sup>214</sup>	b <sup>137</sup>	a <sup>75</sup>	a <sup>71</sup>	6.17	1.90	.41	.26
F	Taraxacum officinale	3	-	1	-	.03	-	.00	-
F	Tragopogon dubius (a)	-	-	-	1	-	-	-	.00
F	Vicia americana	c <sup>80</sup>	a <sup>29</sup>	bc <sup>66</sup>	ab <sup>41</sup>	1.09	.11	1.28	.28
F	Zigadenus paniculatus	6	5	-	7	.03	.01	-	.01
Total for Annual Forbs		38	41	83	83	0.16	0.17	0.85	0.25
Total for Perennial Forbs		678	395	470	402	27.60	17.88	21.35	16.36
Total for Forbs		716	436	553	485	27.76	18.06	22.20	16.62

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

#### BROWSE TRENDS--

Management unit 30, Study no: 45

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	.19	.81	.03	.03	2.40	.30	-
B	Artemisia tridentata vaseyana	2.12	1.44	.03	.18	2.25	-	.45
B	Chrysothamnus depressus	-	.15	-	.00	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	.03	-	-	.03	-	-	-
B	Opuntia sp.	-	-	-	-	.33	-	0
B	Quercus gambelii	11.91	22.98	8.64	15.45	44.20	13.16	35.50
B	Symphoricarpos oreophilus	4.14	1.94	4.94	3.17	4.23	6.91	7.43
Total for Browse		18.40	27.33	13.66	18.86	53.41	20.37	43.38

#### BASIC COVER--

Management unit 30, Study no: 45

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	46.23	48.97	40.34	48.65
Rock	21.60	22.73	22.74	21.86
Pavement	2.88	1.32	3.88	3.70
Litter	58.93	43.52	29.81	43.34
Bare Ground	5.20	8.32	20.83	8.40

PELLET GROUP DATA--

Management unit 30, Study no: 45

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	-	1	4	2
Elk	-	-	-	-
Deer	17	9	36	15

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	1 (2)	-
40 (99)	68 (167)	50 (122)	28 (71)

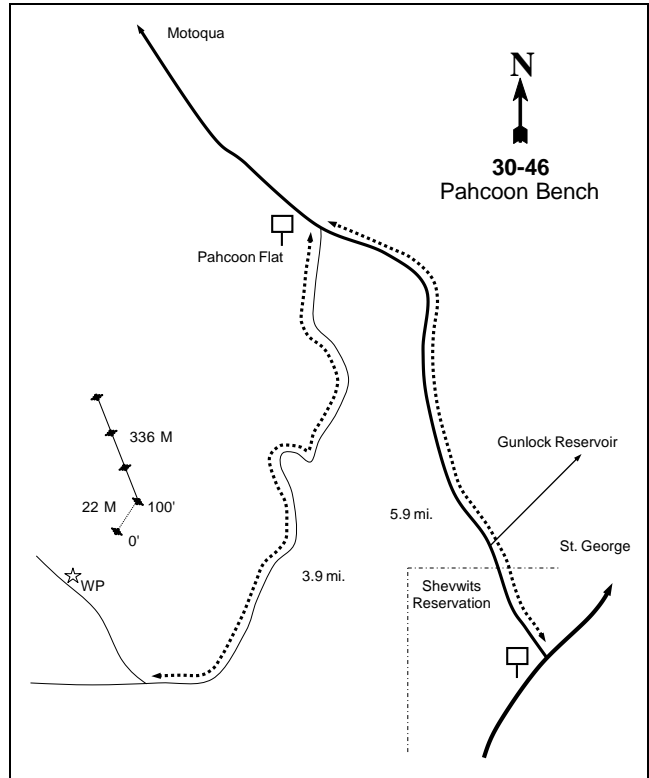
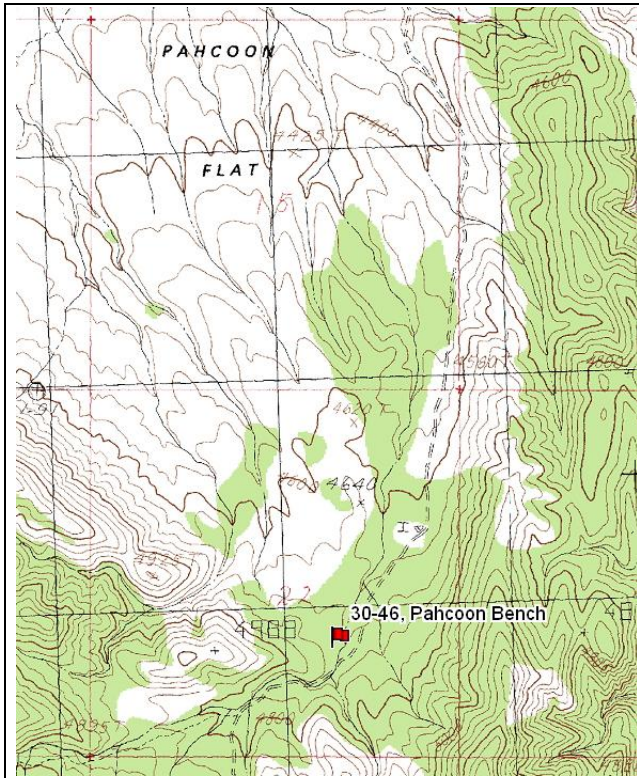
BROWSE CHARACTERISTICS--

Management unit 30, Study no: 45

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
98	<b>800</b>	35	65	-	180	70	0	0	46/31
03	<b>40</b>	0	100	-	-	0	50	0	64/67
08	<b>60</b>	33	67	-	-	0	100	33	13/20
13	<b>40</b>	0	100	-	-	0	100	50	11/17
<b>Artemisia tridentata vaseyana</b>									
98	<b>780</b>	3	95	3	-	36	59	3	13/27
03	<b>540</b>	0	70	30	-	30	7	4	14/27
08	<b>80</b>	75	25	0	-	0	25	75	4/9
13	<b>100</b>	20	80	0	200	40	20	0	8/17
<b>Chrysothamnus depressus</b>									
98	<b>440</b>	95	5	-	-	0	0	0	8/15
03	<b>20</b>	0	100	-	-	100	0	0	7/19
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>60</b>	67	33	-	-	0	0	0	3/6
<b>Chrysothamnus viscidiflorus viscidiflorus</b>									
98	<b>20</b>	100	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	30/61
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	9/8
<b>Opuntia sp.</b>									
98	<b>80</b>	0	100	-	-	0	0	75	8/17
03	<b>100</b>	0	100	-	-	0	0	0	6/15
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<b>Prunus virginiana</b>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>20</b>	100	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Purshia tridentata</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Quercus gambelii</i>										
98	<b>6760</b>	20	79	2	160	21	0	0	44/30	
03	<b>10420</b>	27	62	11	40	12	7	4	46/30	
08	<b>25240</b>	14	37	49	500	7	.47	84	25/15	
13	<b>10440</b>	31	68	1	460	33	0	.76	30/23	
<i>Symphoricarpos oreophilus</i>										
98	<b>980</b>	10	90	-	100	0	0	0	21/30	
03	<b>1160</b>	16	84	-	-	0	5	0	17/42	
08	<b>740</b>	3	97	-	20	0	0	0	23/60	
13	<b>840</b>	12	88	-	20	2	0	0	18/49	

PAHCOON BENCH - TREND STUDY NO. 30-46



**Location Information**

USGS 7.5 min Map Info      Shivwits; Township 41S, Range 18W, Section 22  
 GPS (0' Stake)              NAD 83, UTM Zone 12, 247139 East 4121021 North

**Transect Information**

Browse Tag # (0' Stake)      471  
 Transect Bearing              22° magnetic (line 2-4: 336° magnetic)  
 Length                          400ft  
 Belt Placement                Line 1 (18ft & 96ft), Line 2 (57ft), Line 20ft), Line 4 (73ft)  
 Belt Marker Placement      Standard

**Directions to Site**

Proceed past Shivwits approximately 0.9 mile and turn north on the Jackson Springs-Motoqua road. Proceed 5.9 miles on this road past the road to Motoqua to a fork on the left towards Pahcoon Flat. Take the road towards Pahcoon Flat for 3.9 miles, traveling through a seeding. At 3.9 miles, there will be a small, obscure road to the right. Walk 67 paces up the road to the witness post off the east side of the road. The 0-foot baseline stake is 2.5 paces from the witness post at 22 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The 0-foot stake is marked by browse tag #471.

**Site Information**

Land Ownership BLM  
 Allotment Jackson Wash  
 Elevation 4,670ft (1,423m)  
 Aspect East  
 Slope 3-5%  
 Sample Dates 07/26/1982, 07/14/1992, 05/12/1998, 05/20/2003, 05/07/2008, 05/15/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 46

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	1979	-
Seeding	-	-	1979	-
Fire	Pachoon	-	1998	6,363
Seeding	-	-	(1998)	-
Fire	Apex	-	2003	29,933

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 46

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982	Annual Grass/Mountain Big Sagebrush	Phase I
1992-1998	Annual Grass/Stansbury Cliffrose/Bitterbrush/Mountain Big Sagebrush	Phase I
2003	Annual Grass-Forb/Broom Snakeweed	Phase I
2008	Annual Grass-Forb	Phase I
2013	Annual Grass/Broom Snakeweed	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Since 1998, Deer pellet groups and cattle pats have been sampled in low abundance (Table - Pellet Group Data). Due to frequent fire, nearly all of the preferred browse species have been removed from the area, and occupancy by big game is likely infrequent as long as forage remains scarce. Cheatgrass (*Bromus tectorum*) had signs of fungus in 2013. Additionally, desert almond (*Prunus fasciculata*) was insect infested, and a variety of insects were common throughout the site. Roads surround the site and may influence the study area.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic, shallow Ustollic Paleorthids  
 NRCS Ecological Site Not Available  
 NRCS Ecological Site # Not Available

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 46

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	48.0	33.4	18.6	7.0	0.8	2.6	12.6	108.8	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1982, the site was responding well to a chaining and seeding that took place in 1979. The dominant species influencing the area was mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Repeat photography illustrates that the understory may have been dominated by the invasive annual cheatgrass. From 1992 to 1998, the site transitioned from dominance by sagebrush to a mix of mountain big sagebrush, antelope bitterbrush (*Purshia tridentata*), and desert bitterbrush (*Purshia glandulosa*) with an understory dominated by cheatgrass and annual forbs (Table - Browse Characteristics; Table - Herbaceous Trends). Over the same period, Utah juniper was encroaching on the site, but remained within a Phase I successional stage. Since the two wildfires, browse species no longer influence the site as a dominant component and has transitioned to a site that is dominated by annual grasses and forbs (Table - Browse Trends; Table - Herbaceous Trends). Despite the xeric nature of the site, the area has responded well to past treatments and seedings and likely retains potential for successful browse seedings and transplants. Chaparral browse species that are adapted to a frequent fire return interval will likely have more chances for successful reestablishment.

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 30, study no: 46

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	10.7	12.1	0.8	6.3	-20.0	0.2	0.0	<b>10.0</b>	Very Poor
2003	0.8	0.0	0.0	0.4	-11.9	2.0	0.0	<b>-8.8</b>	Very Poor
2008	0.6	0.0	0.0	0.8	-4.9	5.5	0.0	<b>2.0</b>	Very Poor
2013	3.0	0.0	0.0	5.3	-10.1	5.4	0.0	<b>3.5</b>	Very Poor

HERBACEOUS TRENDS--

Management unit 30, Study no: 46

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Agropyron cristatum</i>	b55	a-	a-	a-	1.23	.00	.00	-
G	<i>Agropyron intermedium</i>	b89	a2	a-	a9	1.90	.15	-	.19
G	<i>Bromus rubens</i> (a)	c188	b116	a9	a32	4.65	1.62	.02	.20
G	<i>Bromus tectorum</i> (a)	c453	ab359	a333	b345	29.75	13.42	6.41	10.77
G	<i>Poa secunda</i>	4	10	-	5	.01	.04	-	.04
G	<i>Sitanion hystrix</i>	1	-	-	-	.00	-	-	-
G	<i>Sporobolus cryptandrus</i>	a-	a-	b11	c117	-	.00	.39	2.41
G	<i>Vulpia octoflora</i> (a)	b106	b115	a20	b158	1.14	.80	.03	2.54
Total for Annual Grasses		747	590	362	535	35.54	15.85	6.47	13.52
Total for Perennial Grasses		149	12	11	131	3.14	0.20	0.40	2.64
Total for Grasses		896	602	373	666	38.68	16.06	6.87	16.16
F	<i>Allium</i> sp.	2	-	-	-	.01	-	-	-
F	<i>Alyssum alyssoides</i> (a)	-	6	6	-	-	.01	.04	-
F	<i>Astragalus</i> sp.	2	-	1	-	.01	-	.03	-
F	<i>Brickellia oblongifolia linifolia</i>	-	-	-	4	-	-	-	.53

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Calochortus nuttallii</i>	9	3	3	-	.01	.00	.03	-
F	<i>Chenopodium fremontii</i> (a)	a <sup>-</sup>	b <sup>13</sup>	a <sup>3</sup>	a <sup>-</sup>	-	.02	.00	-
F	<i>Descurainia pinnata</i> (a)	9	3	-	-	.01	.00	-	-
F	<i>Draba</i> sp. (a)	c <sup>111</sup>	ab <sup>10</sup>	a <sup>4</sup>	b <sup>39</sup>	.31	.03	.00	.12
F	<i>Erigeron flagellaris</i>	-	-	-	2	-	-	-	.00
F	<i>Eriogonum cernuum</i> (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	b <sup>24</sup>	-	-	-	.11
F	<i>Erodium cicutarium</i> (a)	a <sup>31</sup>	c <sup>216</sup>	d <sup>458</sup>	b <sup>72</sup>	.73	13.87	42.32	1.12
F	<i>Gilia</i> sp. (a)	ab <sup>3</sup>	a <sup>-</sup>	b <sup>14</sup>	c <sup>94</sup>	.00	-	.03	1.03
F	<i>Helianthus annuus</i> (a)	-	-	-	3	-	-	-	.00
F	<i>Heterotheca villosa</i>	-	-	-	11	-	-	-	.04
F	<i>Lactuca serriola</i> (a)	-	4	-	-	-	.03	-	-
F	<i>Lupinus</i> sp. (a)	a <sup>-</sup>	a <sup>-</sup>	b <sup>15</sup>	a <sup>-</sup>	-	-	.51	-
F	<i>Lychnis drummondii</i>	b <sup>9</sup>	a <sup>-</sup>	a <sup>-</sup>	a <sup>-</sup>	.05	-	-	-
F	<i>Microsteris gracilis</i> (a)	c <sup>169</sup>	ab <sup>8</sup>	a <sup>-</sup>	b <sup>17</sup>	.64	.02	-	.05
F	<i>Navarretia intertexta</i> (a)	-	3	4	-	-	.01	.01	-
F	<i>Oenothera</i> sp.	-	-	1	-	-	-	.00	-
F	<i>Plantago patagonica</i> (a)	b <sup>30</sup>	b <sup>29</sup>	c <sup>68</sup>	a <sup>2</sup>	.13	.21	.33	.01
F	<i>Ranunculus testiculatus</i> (a)	a <sup>-</sup>	a <sup>-</sup>	a <sup>3</sup>	b <sup>29</sup>	-	-	.00	.28
F	<i>Sisymbrium altissimum</i> (a)	a <sup>-</sup>	b <sup>22</sup>	a <sup>3</sup>	a <sup>-</sup>	-	1.46	.07	-
F	<i>Sphaeralcea grossulariifolia</i>	a <sup>3</sup>	b <sup>61</sup>	b <sup>57</sup>	b <sup>98</sup>	.00	.97	2.52	2.06
F	Unknown forb-perennial	-	-	-	1	-	-	-	.00
F	Unknown forb-perennial 2	-	-	-	10	-	-	-	.04
F	<i>Verbena bracteata</i>	-	-	2	1	-	-	.15	.00
Total for Annual Forbs		353	314	578	280	1.83	15.67	43.33	2.74
Total for Perennial Forbs		25	64	64	127	0.08	0.98	2.74	2.69
Total for Forbs		378	378	642	407	1.92	16.65	46.08	5.43

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

#### BROWSE TRENDS--

Management unit 30, Study no: 46

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata vaseyana</i>	4.31	.03	-	-	-	-	-
B	<i>Chrysothamnus nauseosus hololeucus</i>	.15	-	-	-	-	-	-
B	<i>Cowania mexicana stansburiana</i>	1.52	-	-	-	-	-	-
B	<i>Ephedra viridis</i>	.63	-	-	-	-	-	-
B	<i>Gutierrezia microcephala</i>	6.18	11.86	.40	3.44	14.85	.53	3.71
B	<i>Juniperus osteosperma</i>	2.75	-	-	-	-	-	-
B	<i>Kochia prostrata</i>	-	.34	.40	1.97	.60	.91	1.46
B	<i>Opuntia</i> sp.	.00	-	-	.00	-	-	-
B	<i>Prunus fasciculata</i>	-	.39	.66	1.18	.83	1.06	1.46

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Purshia tridentata</i>	1.48	.15	-	-	-	-	-
Total for Browse		17.03	12.77	1.46	6.61	16.28	2.5	6.63

BASIC COVER--

Management unit 30, Study no: 46

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	53.28	48.51	51.93	32.21
Rock	10.22	11.40	10.78	9.23
Pavement	9.87	7.26	8.51	3.95
Litter	55.49	31.16	27.81	56.40
Cryptogams	1.21	.03	.05	.01
Bare Ground	7.42	13.07	12.21	11.82

PELLET GROUP DATA--

Management unit 30, Study no: 46

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	34	10	7	2	-	-	-	-
Elk	-	-	2	-	-	-	-	-
Deer	33	20	29	5	19 (47)	25 (63)	7 (18)	14 (34)
Cattle	3	2	4	6	13 (32)	8 (20)	27 (66)	-

BROWSE CHARACTERISTICS--

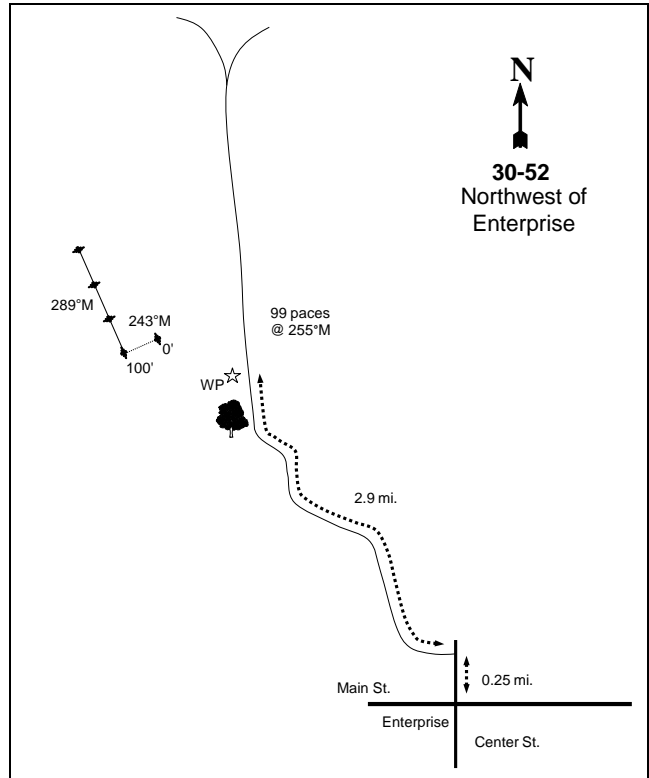
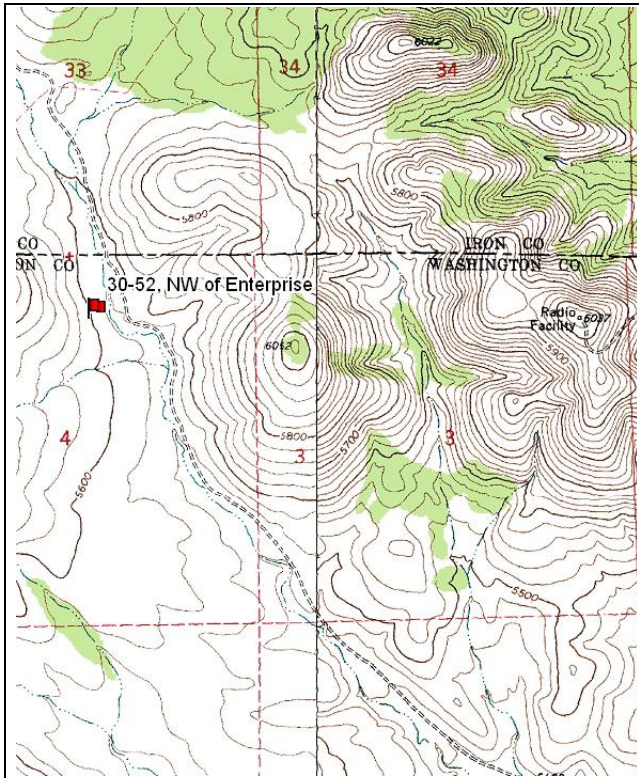
Management unit 30, Study no: 46

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Artemisia tridentata vaseyana</i>									
98	<b>800</b>	3	83	15	-	20	0	3	28/36
03	<b>120</b>	67	33	0	20	0	17	0	17/15
08	<b>0</b>	0	0	0	-	0	0	0	77/17
13	<b>0</b>	0	0	0	-	0	0	0	26/31
<i>Cowania mexicana stansburiana</i>									
98	<b>260</b>	0	92	8	100	31	15	0	61/52
03	<b>20</b>	0	0	100	-	0	0	0	26/23
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Ephedra viridis</i>									
98	<b>20</b>	0	100	-	-	100	0	0	30/38
03	<b>0</b>	0	0	-	-	0	0	0	25/48
08	<b>0</b>	0	0	-	-	0	0	0	11/19
13	<b>0</b>	0	0	-	-	0	0	0	-/-



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>Gutierrezia microrcephala</i>									
98	<b>7360</b>	2	97	1	80	0	0	1	9/12
03	<b>17600</b>	11	86	3	80	0	0	1	12/13
08	<b>1340</b>	12	84	4	-	0	1	3	9/10
13	<b>5260</b>	6	94	0	-	0	0	0	11/13
<i>Juniperus osteosperma</i>									
98	<b>140</b>	57	43	-	20	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Kochia prostrata</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>260</b>	31	69	-	40	0	0	0	10/15
08	<b>1080</b>	56	44	-	-	6	6	0	10/16
13	<b>1860</b>	3	97	-	-	0	0	0	9/16
<i>Opuntia sp.</i>									
98	<b>60</b>	33	67	-	-	0	0	0	8/20
03	<b>0</b>	0	0	-	-	0	0	0	8/18
08	<b>0</b>	0	0	-	-	0	0	0	10/27
13	<b>0</b>	0	0	-	-	0	0	0	11/40
<i>Prunus fasciculata</i>									
98	<b>100</b>	20	60	20	-	0	0	20	51/72
03	<b>100</b>	0	100	0	-	20	0	20	39/56
08	<b>80</b>	0	25	75	-	0	0	0	28/38
13	<b>120</b>	0	100	0	-	33	0	0	36/53
<i>Purshia tridentata</i>									
98	<b>60</b>	0	100	0	60	33	67	0	47/71
03	<b>20</b>	0	0	100	-	100	0	0	44/38
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Quercus turbinella</i>									
98	<b>0</b>	0	0	-	20	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-

NORTHWEST OF ENTERPRISE - TREND STUDY NO. 30-52



**Location Information**

USGS 7.5 min Map Info Hebron; Township 37S, Range 17W, Section 4  
 GPS (0' Stake) NAD 83, UTM Zone 12, 256166 East 4165271 North

**Transect Information**

Browse Tag # (0' Stake) 223  
 Transect Bearing 245° magnetic (Line 2-4: 289° magnetic)  
 Length 400ft  
 Belt Placement Line 1 (8ft & 94ft), Line 2 (37ft), Line 3 (51ft), Line 4 (63ft)  
 Belt Marker Placement Standard

**Directions to Site**

Starting from the town of Enterprise, turn north on 200 West and pass over a bridge. From the bridge, drive 0.6 miles to just past 375 West and turn right on Old Modena Road right before the fire hydrant. From there, travel 2.3 miles. Stop where the road makes a turn to the north. On the left side of the road, before the bend, are a few junipers. Past the junipers is a witness post on the left side of the road. From the witness post the 0-foot baseline stake is 99 paces at 260 degrees magnetic, marked with browse tag #223. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.

**Site Information**

Land Ownership BLM  
 Allotment Haystack Mountain  
 Elevation 5,580ft (1,701m)  
 Aspect Northeast  
 Slope 25%  
 Sample Dates 07/22/1982, 07/06/1992, 05/20/1998, 05/29/2003, 05/22/2008, 05/23/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 52

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Wildfire	Barn	-	1998	1815
Seeding (Aerial)	-	-	1998	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 52

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1982-1998	Wyoming Big Sagebrush/Juniper	Phase I transitioning to Phase II
2003	Perennial Grass	Phase I
2008	Annual-Perennial Grass	Phase I
2013	Annual-Perennial Grass/Forage Kochia	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Little sign of deer was noted in 1992. The lower flatter area was chained after seed was flown on.

**Site Potential**

1981-2010 Average Annual Precipitation 16 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Lithic Xeric Haplargids  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY220UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 52

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	32.6	45.2	22.2	6.6	0.5	2.7	25.9	732.8	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site, which does have a defined state and transition, model (USDA-NRCS, 2011).

When established in 1982, the site was a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with Utah juniper (*Juniperus osteosperma*) trees scattered across the site. The site burned following the sampling in 1998 and transitioned to a perennial grass dominated state. Cheatgrass (*Bromus tectorum*) has fluctuated in abundance over the sample years, but following the fire has become the dominant

component of the site. Forbs have been rare on the site over the sample years (Table - Herbaceous Trends). It is predicted with proper grazing management and without disturbance; the site will transition back to a Wyoming big sagebrush dominated community (USDA-NRCS, 2011).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 30, study no: 52

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	12.2	1.3	4.6	29.5	-2.6	1.3	0.0	<b>46.4</b>	Fair-Good
2003	1.5	0.0	0.0	22.6	-0.1	1.8	0.0	<b>25.7</b>	Poor-Fair
2008	3.5	0.0	0.0	16.7	-18.3	2.3	0.0	<b>4.2</b>	Very Poor
2013	5.6	0.0	0.0	17.0	-10.8	5.1	0.0	<b>16.9</b>	Poor

HERBACEOUS TRENDS--  
Management unit 30, Study no: 52

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	a-	b19	b17	b14	-	.27	.38	.25
G	Agropyron intermedium	a-	a-	a-	b27	-	-	-	.52
G	Agropyron smithii	a48	b100	b135	bc119	.55	3.41	3.12	2.42
G	Agropyron spicatum	-	4	-	-	-	.15	-	-
G	Bromus tectorum (a)	b303	a57	c448	c460	3.10	.16	24.34	14.32
G	Hilaria jamesii	a87	ab139	b170	b160	1.79	5.25	4.22	4.43
G	Koeleria cristata	2	-	-	4	.03	-	-	.03
G	Oryzopsis hymenoides	1	7	3	1	.00	.16	.15	.03
G	Poa fendleriana	b109	a-	a-	a3	5.89	-	-	.15
G	Poa secunda	d239	c147	a31	b86	5.57	2.00	.31	.62
G	Sitanion hystrix	c60	ab6	b21	a1	.92	.03	.15	.03
G	Sporobolus cryptandrus	-	-	-	1	-	-	-	.00
G	Vulpia octoflora (a)	c71	b13	a-	ab9	.30	.02	-	.02
Total for Annual Grasses		374	70	448	469	3.40	0.18	24.34	14.35
Total for Perennial Grasses		546	422	377	416	14.77	11.28	8.34	8.50
Total for Grasses		920	492	825	885	18.17	11.46	32.68	22.85
F	Agoseris glauca	-	-	-	1	-	-	-	.03
F	Allium sp.	-	9	-	2	-	.01	-	.00
F	Antennaria sp.	3	-	-	-	.03	-	-	-
F	Astragalus sp.	11	-	2	-	.19	-	.00	-
F	Calochortus nuttallii	ab16	ab10	b18	a1	.03	.02	.05	.00
F	Cirsium sp.	a-	a-	ab3	b11	-	-	.01	.22
F	Collinsia parviflora (a)	b19	a-	b28	b52	.04	-	.06	.08
F	Crepis acuminata	-	2	2	-	-	.03	.03	-
F	Cymopterus sp.	7	1	4	3	.07	.03	.06	.00
F	Descurainia pinnata (a)	-	-	-	7	-	-	-	.04
F	Draba sp. (a)	b21	a-	a-	a2	.05	-	-	.00

Type	Species	Nestled Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Erigeron pumilus	1	-	1	-	.03	-	.00	-
F	Erodium cicutarium (a)	-	-	-	7	-	-	-	.06
F	Helianthus annuus (a)	-	2	4	-	-	.00	.01	-
F	Lactuca serriola (a)	a-	a-	a1	b20	-	-	.00	.06
F	Lappula occidentalis (a)	-	-	3	-	-	-	.00	-
F	Lithospermum sp.	-	-	-	-	-	.00	-	-
F	Lotus plebeius	b40	a1	b24	b37	.18	.00	.91	1.82
F	Lotus utahensis	-	-	-	3	-	-	-	.01
F	Lupinus argenteus	-	-	-	2	-	-	-	.00
F	Lupinus sp. (a)	-	-	4	4	-	-	.01	.04
F	Microsteris gracilis (a)	b28	a-	b23	b54	.05	-	.06	.11
F	Phlox longifolia	c34	b13	ab1	a-	.11	.08	.00	-
F	Plantago patagonica (a)	4	-	-	-	.01	-	-	-
F	Ranunculus testiculatus (a)	-	-	-	7	-	-	-	.04
F	Sisymbrium altissimum (a)	ab2	a-	b9	a-	.00	-	.05	-
F	Sphaeralcea grossulariifolia	a-	c36	b9	c38	-	.71	.03	.46
F	Tragopogon dubius (a)	a-	a-	a4	b68	-	-	.06	.89
F	Trifolium sp.	-	-	1	-	-	-	.03	-
F	Unknown forb-annual (a)	-	2	-	-	-	.03	-	-
Total for Annual Forbs		74	4	76	221	0.16	0.04	0.26	1.33
Total for Perennial Forbs		112	72	65	98	0.65	0.90	1.15	2.57
Total for Forbs		186	76	141	319	0.81	0.94	1.42	3.91

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

#### BROWSE TRENDS--

Management unit 30, Study no: 52

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	9.16	-	-	-	-	-	-
B	Chrysothamnus nauseosus	.38	-	-	-	-	-	-
B	Chrysothamnus viscidiflorus	.51	-	-	-	-	-	-
B	Cowania mexicana stansburiana	.49	-	-	-	-	-	-
B	Gutierrezia sarothrae	1.14	.65	.05	.24	.35	.01	.13
B	Juniperus osteosperma	5.10	-	-	-	-	-	-
B	Kochia prostrata	-	.98	2.33	3.71	2.13	1.70	5.58
B	Polygala subspinoso subspinoso	-	-	-	.00	-	-	-
Total for Browse		16.79	1.64	2.38	3.96	2.48	1.71	5.71

**BASIC COVER--**

Management unit 30, Study no: 52

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	38.28	14.07	39.98	40.51
Rock	36.20	35.83	31.52	27.26
Pavement	6.67	3.94	1.70	.51
Litter	38.02	38.18	45.84	54.31
Cryptogams	2.40	.03	.16	.00
Bare Ground	13.41	16.98	2.40	2.11

**PELLET GROUP DATA--**

Management unit 30, Study no: 52

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	10	18	44	3
Horse	1	-	-	-
Deer	16	12	12	3
Cattle	-	4	14	2

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
-	-	-	-
40 (99)	23 (56)	12 (20)	4 (10)
2 (5)	12 (30)	17 (43)	3 (7)

**BROWSE CHARACTERISTICS--**

Management unit 30, Study no: 52

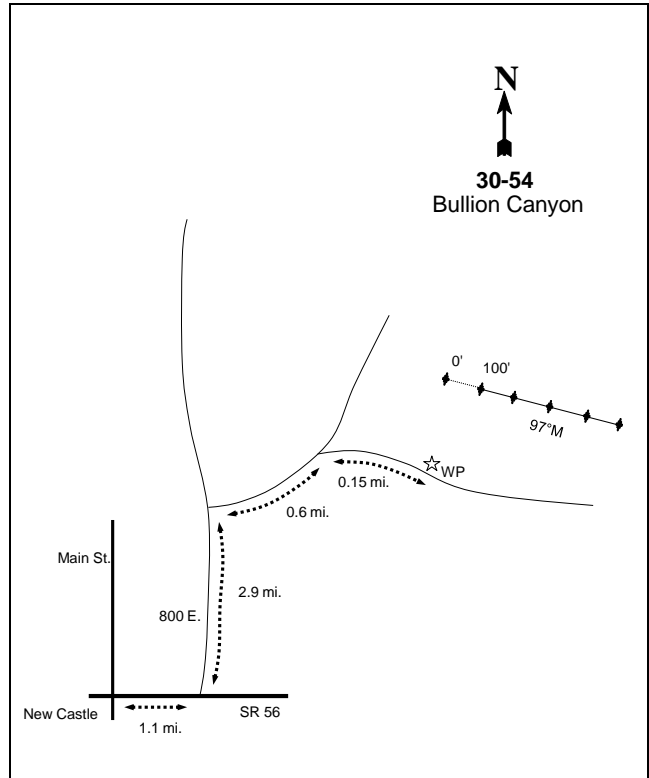
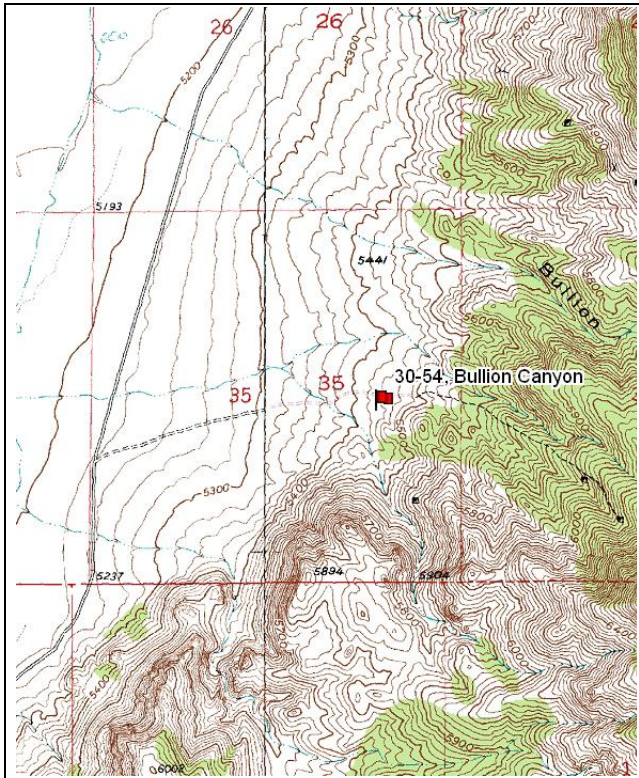
Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
98	20	0	0	100	-	0	0	0	-/-
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-
<b>Artemisia tridentata wyomingensis</b>									
98	2660	8	44	48	40	23	0	20	19/28
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	18/21
13	0	0	0	0	-	0	0	0	21/25
<b>Chrysothamnus viscidiflorus</b>									
98	800	28	70	3	-	0	0	0	11/18
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-
<b>Cowania mexicana stansburiana</b>									
98	380	32	68	-	80	26	47	0	31/25
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Ephedra viridis</i>										
98	0	0	0	0	-	0	0	0	32/51	
03	40	50	0	50	-	0	100	0	17/12	
08	0	0	0	0	-	0	0	0	8/13	
13	0	0	0	0	-	0	0	0	24/36	
<i>Gutierrezia sarothrae</i>										
98	4060	13	83	3	80	0	0	2	6/8	
03	1740	22	39	39	20	5	5	28	4/7	
08	160	0	75	25	340	0	0	0	7/9	
13	420	43	57	0	-	0	0	0	10/13	
<i>Juniperus osteosperma</i>										
98	40	0	100	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Kochia prostrata</i>										
98	0	0	0	0	-	0	0	0	-/-	
03	3100	34	66	0	-	27	4	0	8/11	
08	17580	20	80	0	1600	42	24	0	6/7	
13	17140	34	66	0	16380	17	0	.11	6/8	
<i>Leptodactylon pungens</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	4/5	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	4/20	
13	0	0	0	-	-	0	0	0	6/31	
<i>Polygala subspinososa</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	40	0	100	-	-	50	0	0	3/5	
13	0	0	0	-	-	0	0	0	-/-	
<i>Purshia tridentata</i>										
98	20	0	100	-	-	100	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	6/13	
13	0	0	0	-	-	0	0	0	25/55	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Yucca sp.										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	



BULLION CANYON - TREND STUDY NO. 30-54



**Location Information**

USGS 7.5 min Map Info Silver Peak; Township 35S, Range 15W, Section 35  
 GPS (0' Stake) NAD 83, UTM Zone 12, 280059 East 4176994 North

**Transect Information**

Browse Tag # (0' Stake) 493  
 Transect Bearing 97° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft) Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

Starting at the intersection of Hwy 56 and Main street in New Castle, head east on Hwy 56 1.1 miles to 800 E. Turn left (north) onto 800 E. and drive 2.9 miles to a right turn (0.3 miles past a gate). Go 0.6 miles to a fork. Take the faint two-track road to the right and go 0.15 miles to a witness post on the left side of the road. The 0-foot stake is 91 paces at 37 degrees magnetic from the witness post. The 0-foot stake is marked by browse tag #493. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.

### Site Information

Land Ownership Private  
Allotment Sand Spring  
Elevation 5,450ft (1,661m)  
Aspect West  
Slope 5-10%  
Sample Dates 05/19/1998, 05/21/2003, 05/15/2008, 05/28/2013

### Habitat and Vegetation Information

Wildlife Habitat Deer, Crucial Winter

#### VEGETATION HISTORY--

Management unit 30, Study no: 54

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Wyoming Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

### Site Notes

Agricultural fields are located in the valley bottom about one and a half miles to the west. Some hybridization of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and black sagebrush (*A. nova*) is likely, and all sagebrush plants on the site have been classified as Wyoming sagebrush. Also, hybridization of singleleaf pinyon pine (*Pinus monophylla*) and pinyon pine (*P. edulis*) is likely and for the purposes of this study all pinyon trees have been classified as singleleaf pinyon pine.

### Site Potential

1981-2010 Average Annual Precipitation 14 inches  
NRCS Taxonomical soil Classification Loamy-skeletal, mixed (calcareous), mesic Xeric Torriorthents  
NRCS Ecological Site [Semidesert Gravelly Loam \(Wyoming Big Sagebrush\) South](#)  
NRCS Ecological Site # R028AY214UT

#### SOIL ANALYSIS DATA--

Management unit 30, Study no: 54

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	46.0	29.4	24.6	7.0	0.6	1.7	6.4	160.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

#### States and Transitions

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Gravelly Loam \(Wyoming Big Sagebrush\) North, R028AY215UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1998, the site has been in a stable Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) state, it being the dominant component of the site. The herbaceous understory at study establishment was dominated by the annual grass species cheatgrass (*Bromus tectorum*), but in subsequent sample years cheatgrass has been a minor component (Table - Herbaceous Trends). Pinyon pine and Utah juniper (*Juniperus osteosperma*) have increased on the site (Table - Point Quarter Tree Data). Without a disturbance, it is predicted that pinyon and juniper trees will continue to increase on the site and become the dominant component of the site (USDA-NRCS, 2011).

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 30, study no: 54

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	26.2	9.4	6.1	7.8	-9.4	1.4	0.0	<b>41.5</b>	Fair
2003	16.2	-1.3	3.3	6.4	0.0	1.1	0.0	<b>25.7</b>	Poor-Fair
2008	13.6	3.1	0.5	6.9	-0.4	2.1	0.0	<b>25.8</b>	Poor-Fair
2013	12.7	6.4	1.2	6.9	-0.6	0.9	0.0	<b>27.5</b>	Fair

## HERBACEOUS TRENDS--

Management unit 30, Study no: 54

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	<i>Aristida purpurea</i>	1	5	4	6	.03	.01	.07	.02
G	<i>Bouteloua gracilis</i>	a-	a-	b19	a-	-	-	.30	-
G	<i>Bromus tectorum</i> (a)	c404	a12	b144	b108	12.57	.02	.52	.83
G	<i>Carex</i> sp.	1	-	-	-	.00	-	-	-
G	<i>Hilaria jamesii</i>	112	96	98	116	2.08	2.60	2.49	2.34
G	<i>Oryzopsis hymenoides</i>	ab46	a29	ab25	b50	.95	.52	.41	.73
G	<i>Poa secunda</i>	22	7	12	14	.46	.05	.06	.12
G	<i>Sitanion hystrix</i>	b40	a2	a6	a19	.38	.01	.01	.19
G	<i>Stipa comata</i>	-	-	4	8	-	.00	.07	.04
G	<i>Vulpia octoflora</i> (a)	2	-	6	3	.00	-	.02	.00
Total for Annual Grasses		406	12	150	111	12.57	0.02	0.54	0.84
Total for Perennial Grasses		222	139	168	213	3.91	3.19	3.43	3.47
Total for Grasses		628	151	318	324	16.48	3.22	3.98	4.31
F	<i>Allium</i> sp.	2	-	1	1	.00	-	.00	.00
F	<i>Arabis</i> sp.	4	2	-	-	.00	.01	-	-
F	<i>Astragalus</i> sp.	5	-	4	1	.01	-	.01	.00
F	<i>Brickellia oblongifolia linifolia</i>	-	-	5	4	-	-	.06	.04
F	<i>Calochortus flexuosus</i>	a5	b29	b22	a-	.01	.09	.08	-
F	<i>Castilleja chromosa</i>	ab8	a-	b12	ab2	.09	-	.30	.03
F	<i>Cirsium</i> sp.	8	-	2	1	.04	-	.15	.00
F	<i>Cryptantha</i> sp.	b15	a-	b11	ab2	.03	-	.05	.03
F	<i>Delphinium nuttallianum</i>	-	6	1	-	-	.04	.00	-
F	<i>Descurainia pinnata</i> (a)	b13	a-	a2	a-	.06	-	.00	-
F	<i>Draba</i> sp. (a)	b24	a-	a2	a-	.11	-	.01	-
F	<i>Eriogonum ovalifolium</i>	a-	a-	b15	ab3	-	-	.05	.03
F	<i>Eriogonum</i> sp.	8	11	-	10	.06	.02	-	.07
F	<i>Gilia</i> sp. (a)	b10	a4	c39	a-	.06	.00	.12	-
F	<i>Lappula occidentalis</i> (a)	-	-	7	-	-	-	.02	-
F	<i>Lithospermum</i> sp.	-	5	-	-	-	.18	-	-
F	<i>Lomatium</i> sp.	ab17	b28	b25	a5	.07	.07	.09	.02

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Penstemon sp.	2	-	3	2	.01	-	.03	.03
F	Phlox longifolia	48	45	38	35	.23	.10	.11	.09
F	Senecio multilobatus	1	-	-	-	.03	-	.03	-
F	Sphaeralcea grossulariifolia	-	-	1	1	-	-	.03	.03
F	Streptanthus cordatus	11	8	3	6	.08	.02	.03	.04
Total for Annual Forbs		47	4	50	0	0.23	0.00	0.15	0
Total for Perennial Forbs		134	134	143	73	0.68	0.55	1.04	0.43
Total for Forbs		181	138	193	73	0.91	0.55	1.19	0.43

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

#### BROWSE TRENDS--

Management unit 30, Study no: 54

Type	Species	Average Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Artemisia tridentata wyomingensis	19.54	12.57	10.12	10.04	7.80	9.86	10.43
B	Atriplex canescens	.97	.21	.63	.03	.20	.85	.38
B	Chrysothamnus viscidiflorus stenophyllus	.98	.07	.23	.29	.15	.18	.65
B	Ephedra viridis	.45	.17	.10	.10	.05	.15	.26
B	Gutierrezia sarothrae	.49	.13	1.25	1.17	-	.81	1.38
B	Juniperus osteosperma	1.44	3.44	4.35	5.24	2.90	4.69	5.30
B	Opuntia sp.	-	.03	.15	-	.16	.03	-
B	Pinus monophylla	-	.03	.03	.15	-	-	-
B	Sclerocactus sp.	-	.00	-	-	.03	.03	.06
Total for Browse		23.89	16.66	16.87	17.04	11.29	16.6	18.46

#### POINT-QUARTER TREE DATA--

Management unit 30, Study no: 54

Species	Trees per Acre			
	'98	'03	'08	'13
Juniperus osteosperma	96	157	164	154
Pinus monophylla	-	29	25	27

Average diameter (in)			
'98	'03	'08	'13
1.9	1.7	3.1	2.4
-	1.7	2.0	1.7

BASIC COVER--

Management unit 30, Study no: 54

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	33.48	21.92	21.14	24.56
Rock	14.30	16.04	14.77	11.56
Pavement	33.30	35.89	36.98	26.82
Litter	12.42	20.07	24.34	24.77
Cryptogams	.63	.31	.50	.75
Bare Ground	20.06	15.18	16.81	19.57

PELLET GROUP DATA--

Management unit 30, Study no: 54

Type	Quadrat Frequency			
	'98	'03	'08	'13
Rabbit	9	5	62	5
Deer	24	18	32	12
Cattle	-	1	2	1

Days use per acre (ha)			
'98	'03	'08	'13
-	-	-	-
23 (57)	50 (124)	62 (154)	7 (17)
2 (5)	-	4 (9)	-

BROWSE CHARACTERISTICS--

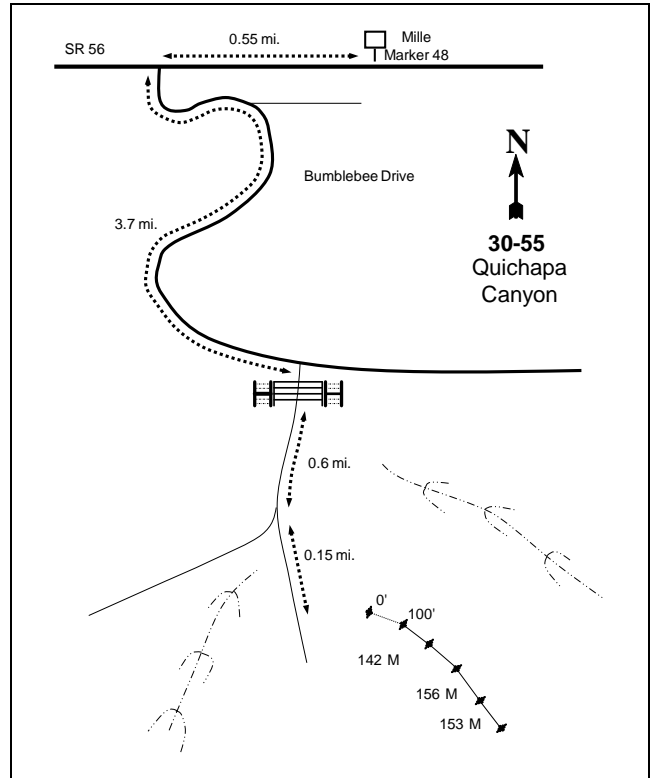
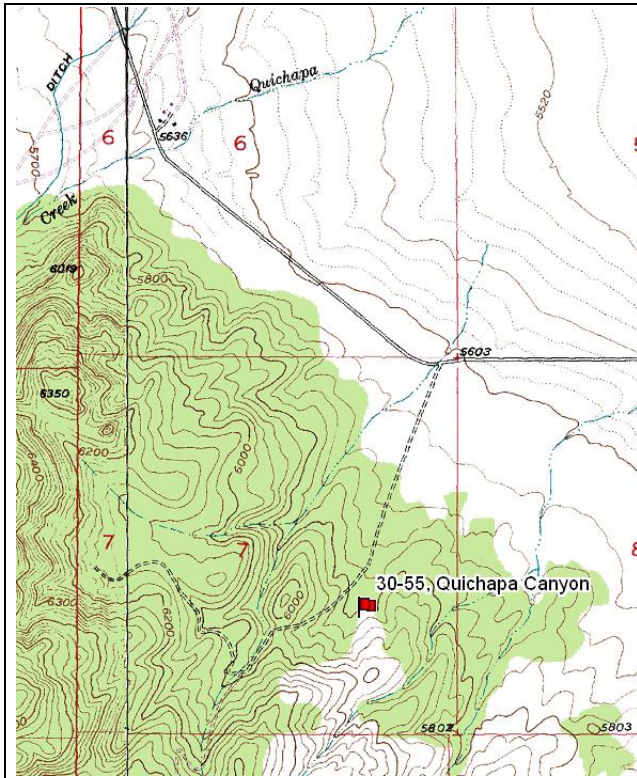
Management unit 30, Study no: 54

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
98	<b>6420</b>	13	69	17	120	60	9	10	12/22	
03	<b>5260</b>	6	40	54	-	31	16	32	9/19	
08	<b>4880</b>	1	57	42	120	30	11	31	11/21	
13	<b>3420</b>	2	69	29	-	22	63	20	11/23	
<i>Atriplex canescens</i>										
98	<b>140</b>	0	57	43	-	86	0	29	21/27	
03	<b>80</b>	0	0	100	-	0	75	75	19/37	
08	<b>60</b>	0	100	0	20	33	0	0	22/38	
13	<b>40</b>	0	100	0	-	50	0	0	25/32	
<i>Chrysothamnus nauseosus</i>										
98	<b>0</b>	0	0	-	-	0	0	0	8/18	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Chrysothamnus viscidiflorus stenophyllus</i>										
98	<b>960</b>	6	85	8	60	2	0	6	10/13	
03	<b>480</b>	13	25	63	-	8	0	50	6/9	
08	<b>660</b>	9	52	39	60	12	12	24	7/10	
13	<b>500</b>	12	84	4	-	24	12	4	8/12	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Ephedra viridis</i>										
98	580	3	62	34	-	14	83	31	16/16	
03	840	57	24	19	-	12	24	26	10/14	
08	760	16	39	45	120	0	89	37	15/19	
13	640	53	44	3	-	6	41	28	13/18	
<i>Grayia spinosa</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	31/41	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
98	1360	31	68	1	20	0	0	1	6/6	
03	560	0	93	7	-	0	0	7	5/7	
08	5320	13	83	5	100	.37	0	2	5/6	
13	2020	7	92	1	-	0	0	3	7/9	
<i>Juniperus osteosperma</i>										
98	140	86	14	-	20	0	0	0	-/-	
03	120	33	67	-	-	0	0	0	-/-	
08	120	33	67	-	-	0	0	0	-/-	
13	160	50	50	-	-	0	0	0	-/-	
<i>Opuntia sp.</i>										
98	80	0	50	50	-	0	0	0	4/7	
03	180	0	67	33	-	0	0	33	5/16	
08	160	25	38	38	-	0	0	38	5/16	
13	0	0	0	0	-	0	0	0	5/13	
<i>Opuntia whipplei</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	40	50	50	-	-	0	0	0	4/11	
<i>Pediocactus simpsonii</i>										
98	60	0	100	0	-	0	0	0	3/3	
03	80	0	75	25	-	0	0	25	2/2	
08	20	0	100	0	-	0	0	0	1/2	
13	20	0	100	0	-	0	0	0	4/6	
<i>Pinus monophylla</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	20	100	0	-	20	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	-/-	

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
Polygala subspinosa										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	5/9	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
Sclerocactus sp.										
98	<b>20</b>	0	100	-	-	0	0	0	-/-	
03	<b>80</b>	0	100	-	-	0	0	0	3/2	
08	<b>100</b>	0	100	-	-	0	0	0	4/3	
13	<b>100</b>	0	100	-	-	0	0	0	4/5	

QUICHAPA CANYON - TREND STUDY NO. 30-55



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Kanarraville; Township 37S, Range 12W, Section 07  
NAD 83, UTM Zone 12, 302302 East 4162874 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

498  
103° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
Belt 4: 1ft

**Directions to Site**

From SR 56, drive to mile marker 48 and continue east 0.55 miles to Bumble Bee Drive, which is a road on the right (south). Travel 3.7 miles south to a gate on the right. Proceed through the gate and drive 0.6 miles to a fork. Take the left fork for 0.15 miles to the witness post on the left side of the road. The 0-foot stake is 5 paces away at 77 degrees magnetic. The study is marked by half high fenceposts. The 0-foot stake is marked by browse tag # 498.



**Site Information**

Land Ownership BLM  
 Allotment Dry Canyon  
 Elevation 5,860ft (1,786m)  
 Aspect Northwest  
 Slope 20%  
 Sample Dates 06/03/1998, 05/30/2003, 05/20/2008, 05/16/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

VEGETATION HISTORY--

Management unit 30, Study no: 55

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2013	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Water is available for wildlife in a stream one-quarter mile to the northeast of the site. Deer were seen near the site with fresh pellet groups on site when established in 1998. In 2013, Insect galls were found on most of the mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) plants. Antelope bitterbrush (*Purshia tridentata*) was found growing closely associated with other shrubs, and was found to be heavily hedged. Additionally, deer pellet groups were more commonly observed near preferred browse species.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Fine-loamy, mixed, mesic Aridic Argiustolls  
 NRCS Ecological Site Upland Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R028AY310UT

SOIL ANALYSIS DATA--

Management unit 30, Study no: 55

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Loam	36.6	38.7	24.7	6.5	0.6	3.7	14.1	492.8	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 1998, the site was a mixed stand of mountain big sagebrush and Utah juniper (*Juniperus osteosperma*) with an understory comprised mostly of the invasive annual grass species cheatgrass (*Bromus tectorum*) while the remaining perennial grasses and forbs in the understory have provided limited cover over the duration of the study (Table - Browse Trends; Table - Herbaceous Trends). Since establishment, Utah juniper has decreased slightly while mountain big sagebrush has increased in dominance (Table - Browse Characteristics). Despite the decrease in juniper abundance, the age of the stand is maturing, and if given the opportunity through lack of disturbance, Utah juniper will likely increase in dominance on the site and become a main component over time.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 30, study no: 55

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	17.2	2.2	6.1	5.6	-5.3	0.8	0.0	<b>26.6</b>	Very Poor
2003	13.9	3.0	10.8	2.4	-0.7	0.6	0.0	<b>30.1</b>	Very Poor
2008	12.3	8.1	15.0	5.3	-1.8	0.8	0.0	<b>39.8</b>	Poor
2013	16.9	11.7	15.0	6.1	-0.7	1.7	0.0	<b>50.8</b>	Poor-Fair

## HERBACEOUS TRENDS--

Management unit 30, Study no: 55

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	-	-	-	2	-	-	-	.01
G	Bromus tectorum (a)	c371	a150	b235	b237	7.05	.87	2.36	.87
G	Hilaria jamesii	a-	b14	a-	a8	-	.22	-	.03
G	Oryzopsis hymenoides	8	11	11	6	.21	.10	.19	.03
G	Poa bulbosa	2	-	-	-	.00	-	-	-
G	Poa fendleriana	a31	a44	a38	b78	.68	.20	.69	2.02
G	Poa pratensis	-	-	-	1	-	-	-	.00
G	Poa secunda	a3	a2	b29	b23	.03	.00	.09	.17
G	Sitanion hystrix	ab79	a51	b104	b107	1.86	.66	1.66	.79
G	Vulpia octoflora (a)	4	-	-	-	.01	-	-	-
Total for Annual Grasses		375	150	235	237	7.06	0.87	2.36	0.87
Total for Perennial Grasses		123	122	182	225	2.80	1.20	2.65	3.07
Total for Grasses		498	272	417	462	9.86	2.08	5.01	3.95
F	Agoseris glauca	a6	a5	ab7	b19	.01	.01	.07	.06
F	Allium sp.	2	-	-	1	.00	-	-	.00
F	Alyssum alyssoides (a)	-	-	2	-	-	-	.00	-
F	Arabis sp.	-	8	7	5	-	.07	.01	.01
F	Astragalus convallarius	2	-	-	8	.15	-	-	.34
F	Astragalus sp.	8	2	2	2	.02	.00	.03	.01
F	Brodiaea pulchella	a-	a-	b10	a-	-	-	.02	-
F	Calochortus nuttallii	4	2	10	6	.01	.01	.03	.01
F	Castilleja chromosa	3	-	-	-	.00	-	-	-
F	Chaenactis douglasii	9	-	5	5	.02	-	.01	.03
F	Collinsia parviflora (a)	b61	d208	a6	c114	.15	1.26	.01	.21
F	Comandra pallida	-	10	-	-	-	.06	-	-
F	Cymopterus sp.	-	2	6	4	.00	.00	.01	.04
F	Descurainia pinnata (a)	a3	b30	a-	a3	.01	.21	-	.01
F	Draba sp. (a)	b13	a1	ab2	a-	.03	.00	.01	-
F	Gilia sp. (a)	a-	b55	a1	a-	-	.30	.00	-
F	Lappula occidentalis (a)	-	-	5	2	-	-	.00	.00

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Lomatium sp.	3	1	-	-	.00	.00	-	-
F	Microsteris gracilis (a)	<sub>b</sub> 73	<sub>b</sub> 100	<sub>a</sub> 11	<sub>a</sub> 31	.17	.28	.02	.06
F	Navarretia intertexta (a)	-	-	-	1	-	-	-	.00
F	Orobanche fasciculata	2	-	3	4	.00	-	.03	.04
F	Penstemon sp.	2	-	-	-	.00	-	-	-
F	Phlox longifolia	<sub>ab</sub> 19	<sub>ab</sub> 24	<sub>a</sub> 16	<sub>b</sub> 38	.05	.08	.04	.08
F	Polygonum douglasii (a)	<sub>a</sub> -	<sub>a</sub> 5	<sub>b</sub> 19	<sub>a</sub> -	-	.01	.04	-
F	Ranunculus testiculatus (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 21	-	-	-	.04
F	Sphaeralcea grossulariifolia	-	2	-	-	-	.00	-	-
F	Stellaria jamesiana	1	-	-	-	.03	-	-	-
F	Streptanthus cordatus	-	1	4	-	-	.03	.01	-
F	Trifolium sp.	<sub>ab</sub> 18	<sub>a</sub> 8	<sub>ab</sub> 16	<sub>b</sub> 23	.03	.02	.10	.11
F	Vicia americana	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 7	-	-	.00	.06
F	Zigadenus paniculatus	<sub>ab</sub> 3	<sub>a</sub> -	<sub>b</sub> 14	<sub>b</sub> 11	.03	-	.04	.05
Total for Annual Forbs		150	399	46	172	0.36	2.08	0.10	0.33
Total for Perennial Forbs		82	65	101	133	0.39	0.31	0.42	0.87
Total for Forbs		232	464	147	305	0.76	2.39	0.53	1.20

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

#### BROWSE TRENDS--

Management unit 30, Study no: 55

Type	Species	Quadrat Cover %				Line Intercept Cover %		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	5.16	4.99	2.47	1.27	4.26	3.11	1.60
B	Artemisia nova	2.02	-	-	-	-	-	-
B	Artemisia tridentata vaseyana	3.83	3.53	6.20	9.87	6.45	9.93	12.08
B	Gutierrezia sarothrae	-	-	-	.00	-	-	-
B	Juniperus osteosperma	7.07	6.21	6.94	10.75	13.50	13.48	10.80
B	Opuntia sp.					-	.26	-
B	Pinus edulis	.15	.63	-	.06	.51	-	-
B	Purshia tridentata	1.41	1.31	.41	1.23	.48	.56	.41
B	Quercus gambelii	.03	.06	.21	.78	.51	1.13	1.33
Total for Browse		19.68	16.74	16.23	23.98	25.71	28.47	26.43

#### POINT-QUARTER TREE DATA--

Management unit 30, Study no: 55

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	163	196	88	80	6.4	4.9	4.0	2.0
Pinus edulis	23	32	39	34	7.2	2.8	1.0	2.1

BASIC COVER--

Management unit 30, Study no: 55

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	30.07	25.31	19.97	28.91
Rock	11.87	13.54	12.32	10.36
Pavement	17.17	22.49	22.31	11.33
Litter	39.04	32.59	44.25	39.56
Cryptogams	.22	.05	.08	.18
Bare Ground	27.82	20.30	18.71	31.71

PELLET GROUP DATA--

Management unit 30, Study no: 55

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Sheep	2	-	7	-	6 (15)	-	16 (40)	-
Rabbit	30	19	84	24	-	-	-	-
Elk	-	-	1	-	-	-	1 (3)	-
Deer	35	23	42	26	41 (101)	33 (83)	38 (93)	21 (51)
Cattle	-	-	1	-	-	-	-	-

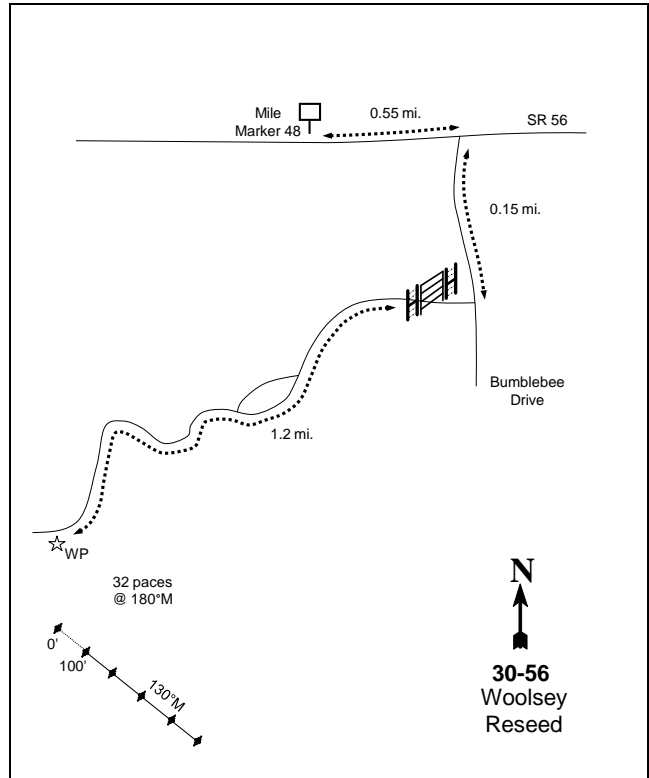
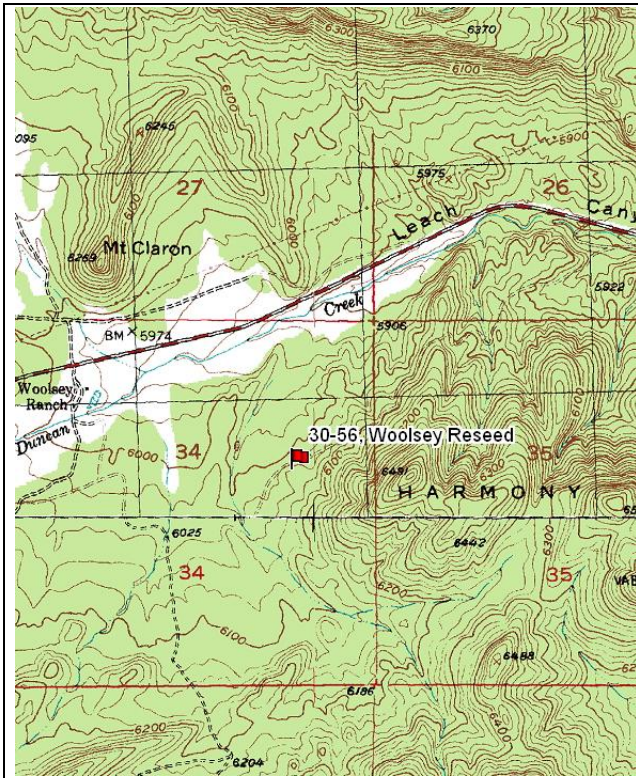
BROWSE CHARACTERISTICS--

Management unit 30, Study no: 55

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization		% poor vigor	Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy		
<b>Amelanchier utahensis</b>									
98	<b>1240</b>	21	35	44	400	27	52	26	45/42
03	<b>1780</b>	42	25	34	220	22	25	20	35/34
08	<b>1020</b>	37	25	37	60	12	14	18	39/40
13	<b>860</b>	44	12	44	120	14	44	21	37/33
<b>Artemisia nova</b>									
98	<b>80</b>	0	0	100	-	0	0	75	8/17
03	<b>0</b>	0	0	0	-	0	0	0	-/-
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<b>Artemisia tridentata vaseyana</b>									
98	<b>2100</b>	11	67	22	80	17	.95	6	21/28
03	<b>1880</b>	0	50	50	-	40	3	22	22/26
08	<b>4820</b>	41	43	16	4640	9	1	7	20/25
13	<b>4360</b>	38	56	6	1040	20	2	2	22/36
<b>Cercocarpus montanus</b>									
98	<b>0</b>	0	0	0	-	0	0	0	44/52
03	<b>0</b>	0	0	0	-	0	0	0	-/-
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>100</b>	20	20	60	20	20	60	0	35/48

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Gutierrezia sarothrae</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	8/9
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	20	0	0	0	6/10
<i>Juniperus osteosperma</i>									
98	160	63	38	-	20	0	0	0	-/-
03	160	38	63	-	-	0	0	0	-/-
08	260	62	38	-	80	0	0	8	-/-
13	180	44	56	-	40	0	0	0	-/-
<i>Opuntia sp.</i>									
98	20	0	100	-	-	0	0	0	6/12
03	60	0	100	-	-	0	0	0	4/15
08	60	0	100	-	-	0	0	0	6/11
13	80	25	75	-	-	0	0	25	6/20
<i>Pinus edulis</i>									
98	60	100	0	-	20	0	0	0	-/-
03	40	100	0	-	-	0	0	0	-/-
08	60	67	33	-	-	0	0	0	-/-
13	40	100	0	-	100	0	0	50	-/-
<i>Purshia tridentata</i>									
98	300	0	87	13	-	0	93	13	20/34
03	260	0	62	38	-	23	69	0	14/29
08	220	0	45	55	-	0	91	45	12/21
13	80	0	75	25	-	0	100	0	15/36
<i>Quercus gambelii</i>									
98	160	75	25	-	20	0	13	13	31/30
03	200	80	20	-	-	0	20	0	46/37
08	760	74	26	-	-	5	0	3	40/38
13	420	76	24	-	80	24	14	0	20/21

WOOLSEY RESEEDING - TREND STUDY NO. 30-56



**Location Information**

USGS 7.5 min Map Info Desert Mound; Township 36S, Range 13W, Section 34  
 GPS (0' Stake) NAD 83, UTM Zone 12, 297606 East 4166888 North

**Transect Information**

Browse Tag # (0' Stake) 95  
 Transect Bearing 130° magnetic  
 Length 400ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From mile marker 48 on Highway 56 go east 0.55 miles to Bumblebee drive. Turn right (south) and travel 0.15 miles crossing a bridge to a right turn. Take this turn while going through the gate, and proceed 1.2 miles to a witness post in a chaining. From the witness post, the 0-foot stake is 32 paces directly south. The 0-foot stake is marked by browse tag # 95. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.

**Site Information**

Land Ownership BLM  
 Allotment New Harmony  
 Elevation 6,050ft (1,844m)  
 Aspect Northwest  
 Slope 10-15%  
 Sample Dates 06/01/1998, 05/23/2003, 05/20/2008, 05/16/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 56

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Chaining	-	-	Historic	-
Seeding	-	-	Historic	-
Bullhog	-	-	2005-2006	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 56

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2003	Perennial Grass/Pinyon-Juniper	Phase I transitioning to Phase II
2008-2013	Perennial Grass	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Deer pellet groups have been sampled in high abundance since 1998, but was considered in low abundance in 2013 (Table - Pellet Group Data). Additionally, deer pellet groups were also found to be more common on the hillside, while cattle pats were found on the flatter terrain. Escape cover for wildlife can be found on the site in the form of large Utah serviceberry (*Amelanchier utahensis*) while more substantial cover can be found within the untreated areas of pinyon-juniper. Cicadas were observed on the site in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, carbonatic, mesic Calcixerollic Xerochrepts  
 NRCS Ecological Site Upland Gravelly Loam (Bonneville Big Sagebrush)  
 NRCS Ecological Site # R028AY306UT

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 56

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	38.0	25.4	36.6	7.0	0.7	3.5	6.1	118.4	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1998, the site was dominated by the introduced perennial grass species crested wheatgrass (*Agropyron cristatum*) and Russian wildrye (*Elymus junceus*) with a diverse component of perennial forbs (Table - Herbaceous Trends). Between 1998 and 2003, Utah juniper and pinyon pine (*Pinus edulis*) began to

encroach on the site, but was removed almost entirely prior to the 2008 sampling. Perennial grasses have remained dominant over the duration of the study. Continued landscape maintenance has contributed to the reduction of woody fuel and has provided abundant forage for livestock. Sagebrush establishment on this site may be affected by the high cover provided by seeded perennial grasses (Table - Herbaceous Trends; Browse Trends).

### Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 30, study no: 56

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	2.0	0.0	0.0	30.0	-0.6	1.7	0.0	<b>33.2</b>	Very Poor-Poor
2003	1.5	0.0	0.0	22.8	0.0	1.3	0.0	<b>25.5</b>	Very Poor
2008	2.2	0.0	0.0	30.0	-0.3	0.7	0.0	<b>32.6</b>	Very Poor
2013	1.9	0.0	0.0	30.0	0.0	0.8	0.0	<b>32.6</b>	Very Poor

HERBACEOUS TRENDS--  
Management unit 30, Study no: 56

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	ab190	b262	a186	a184	8.09	8.57	16.59	10.27
G	Agropyron intermedium	b287	a54	a51	b282	13.57	1.40	2.34	14.01
G	Bromus inermis	-	-	1	-	-	-	.00	-
G	Bromus tectorum (a)	b75	a14	b85	a15	.75	.04	.34	.03
G	Elymus junceus	b110	a57	c204	ab127	4.10	1.38	19.44	4.95
G	Oryzopsis hymenoides	-	-	6	4	.03	.00	.15	.05
G	Poa secunda	4	2	2	3	.01	.03	.00	.06
G	Sitanion hystrix	ab3	a-	b7	a-	.15	-	.36	-
Total for Annual Grasses		75	14	85	15	0.75	0.04	0.34	0.03
Total for Perennial Grasses		594	375	457	600	25.96	11.39	38.92	29.34
Total for Grasses		669	389	542	615	26.71	11.43	39.26	29.38
F	Astragalus calycosus	-	-	-	3	-	-	-	.03
F	Astragalus humistratus	-	-	-	4	-	-	-	.03
F	Astragalus sp.	5	1	6	-	.09	.00	.03	-
F	Collinsia parviflora (a)	-	-	2	1	-	-	.00	.00
F	Cryptantha sp.	a-	ab4	b10	ab7	-	.03	.05	.04
F	Cymopterus sp.	7	8	-	6	.09	.04	-	.04
F	Dalea flavescens	5	-	2	-	.30	-	.00	-
F	Descurainia pinnata (a)	a5	b22	a-	a7	.01	.14	-	.01
F	Draba sp. (a)	b11	b27	a-	b21	.03	.16	-	.05
F	Eriogonum shockleyi	-	-	-	-	-	-	.00	-
F	Eriogonum umbellatum	3	2	-	-	.03	.03	-	-
F	Lappula occidentalis (a)	ab3	b15	ab3	a-	.01	.20	.01	-
F	Lesquerella sp.	4	3	6	-	.07	.01	.01	-
F	Lotus utahensis	2	-	2	-	.03	-	.00	-



Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Lupinus argenteus	3	-	-	-	.00	-	-	-
F	Microsteris gracilis (a)	c21	b8	a3	a-	.05	.02	.01	-
F	Pedicularis centranthera	-	6	5	5	-	.44	.18	.18
F	Penstemon confusus	4	4	2	10	.00	.01	.00	.05
F	Petradoria pumila	9	4	-	-	.18	.01	.00	.00
F	Phlox hoodii	5	4	1	2	.04	.01	.00	.01
F	Phlox longifolia	-	1	-	-	-	.00	-	-
F	Polygonum douglasii (a)	-	6	9	-	-	.01	.02	-
F	Ranunculus testiculatus (a)	a-	a1	b35	b37	-	.00	.10	.09
F	Streptanthus cordatus	ab2	b13	ab8	a-	.01	.03	.04	-
Total for Annual Forbs		40	79	52	66	0.10	0.54	0.14	0.16
Total for Perennial Forbs		49	50	42	37	0.85	0.64	0.34	0.38
Total for Forbs		89	129	94	103	0.96	1.19	0.49	0.54

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

#### BROWSE TRENDS--

Management unit 30, Study no: 56

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	.85	.98	.98	.98	.81	.98	1.01
B	Artemisia tridentata vaseyana	-	-	.03	.00	-	.11	.08
B	Chrysothamnus depressus	.55	-	.03	.06	-	-	-
B	Chrysothamnus nauseosus hololeucus	1.56	.45	.64	1.04	.16	-	1.20
B	Chrysothamnus viscidiflorus	-	-	.15	-	-	-	-
B	Cowania mexicana stansburiana	-	-	.15	.18	.08	.20	.43
B	Eriogonum microthecum	.03	.01	.04	.03	-	-	-
B	Gutierrezia sarothrae	.45	.26	.81	1.16	.50	.68	.40
B	Juniperus osteosperma	1.94	5.10	.00	-	6.15	-	-
B	Pinus edulis	1.97	.18	-	-	1.26	-	-
B	Purshia tridentata	.03	-	-	-	-	-	-
Total for Browse		7.40	6.99	2.83	3.46	8.96	1.97	3.12

#### POINT-QUARTER TREE DATA--

Management unit 30, Study no: 56

Species	Trees per Acre				Average diameter (in)			
	'98	'03	'08	'13	'98	'03	'08	'13
Juniperus osteosperma	59	63	30	23	2.0	3.4	1.8	1.3
Pinus edulis	28	41	18	18	2.0	2.3	-	2.0

**BASIC COVER--**

Management unit 30, Study no: 56

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	39.56	20.13	42.75	41.66
Rock	5.94	8.20	5.02	3.27
Pavement	9.63	19.89	15.67	5.48
Litter	52.23	47.84	46.15	59.46
Cryptogams	.24	.04	.43	.75
Bare Ground	18.28	10.11	7.16	5.21

**PELLET GROUP DATA--**

Management unit 30, Study no: 56

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Sheep	-	-	1	-	-	-	3 (8)	-
Rabbit	25	23	90	7	-	-	-	-
Deer	24	30	39	19	36 (89)	44 (109)	41 (101)	5 (13)
Cattle	11	8	4	-	54 (133)	26 (64)	9 (22)	4 (11)

**BROWSE CHARACTERISTICS--**

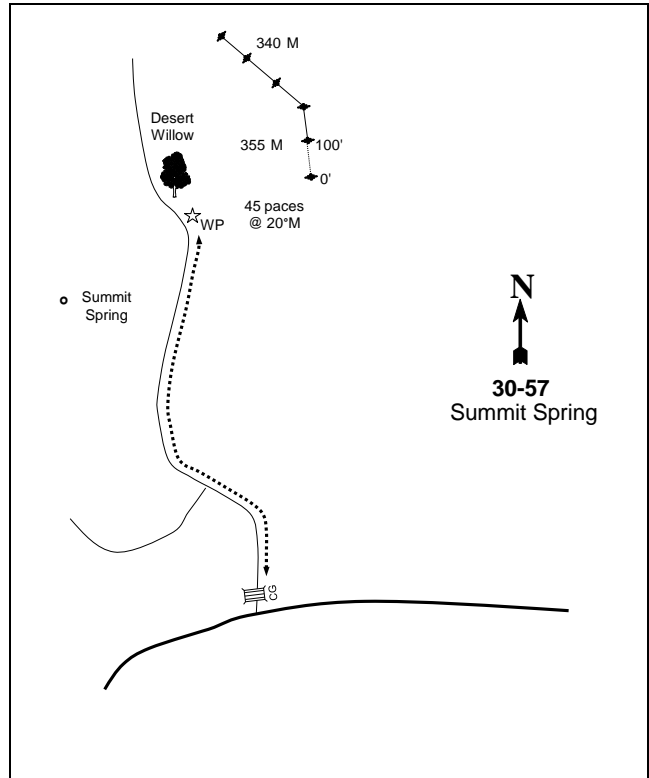
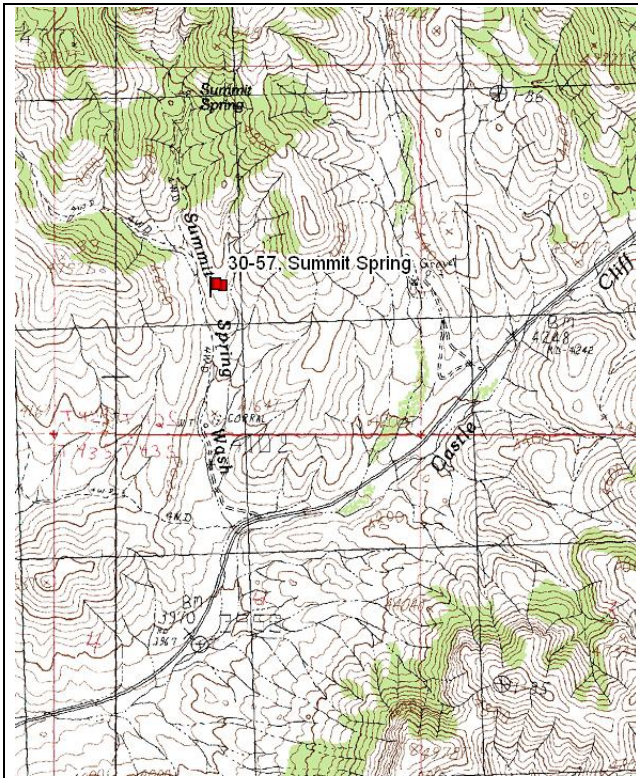
Management unit 30, Study no: 56

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<b>Amelanchier utahensis</b>									
98	40	0	100	-	-	100	0	0	37/51
03	40	50	50	-	20	50	0	0	58/70
08	60	33	67	-	60	33	33	0	72/93
13	120	83	17	-	-	0	0	0	38/42
<b>Artemisia tridentata vaseyana</b>									
98	20	100	0	-	-	0	0	0	-/-
03	20	0	100	-	-	0	100	0	8/-
08	20	0	100	-	80	0	0	0	14/15
13	40	0	100	-	-	0	0	0	13/19
<b>Cercocarpus ledifolius</b>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	35/47
08	0	0	0	-	-	0	0	0	34/53
13	0	0	0	-	-	0	0	0	41/52
<b>Cercocarpus montanus</b>									
98	20	0	100	0	-	0	100	0	50/54
03	20	0	0	100	-	0	100	0	64/60
08	20	0	0	100	-	0	100	100	38/44
13	40	0	100	0	-	0	50	0	40/34

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<b>Chrysothamnus depressus</b>										
98	620	16	84	-	20	0	0	0	4/6	
03	100	20	80	-	-	0	0	0	3/5	
08	40	0	100	-	-	0	0	0	-/-	
13	120	33	67	-	40	33	0	0	3/5	
<b>Chrysothamnus nauseosus hololeucus</b>										
98	300	13	60	27	-	40	0	13	34/43	
03	320	0	94	6	-	6	0	0	30/38	
08	200	20	50	30	-	30	20	30	30/32	
13	180	0	78	22	20	0	11	0	25/38	
<b>Chrysothamnus viscidiflorus</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	9/14	
13	0	0	0	-	-	0	0	0	12/19	
<b>Cowania mexicana stansburiana</b>										
98	0	0	0	0	-	0	0	0	62/66	
03	60	0	67	33	-	0	33	0	54/56	
08	40	50	50	0	-	0	50	0	73/58	
13	40	50	50	0	-	50	0	0	78/72	
<b>Eriogonum microthecum</b>										
98	60	33	67	0	-	0	0	0	4/11	
03	80	0	75	25	-	100	0	0	1/2	
08	220	0	100	0	40	18	0	0	3/4	
13	80	50	50	0	-	0	25	0	4/6	
<b>Gutierrezia sarothrae</b>										
98	1180	5	95	0	80	0	0	0	7/10	
03	1260	3	94	3	640	0	0	2	5/6	
08	1920	11	55	33	2020	1	2	8	6/9	
13	2420	24	69	7	800	0	0	5	5/8	
<b>Juniperus osteosperma</b>										
98	100	40	60	-	40	0	0	0	-/-	
03	100	0	100	-	-	0	0	0	-/-	
08	0	0	0	-	60	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<b>Opuntia sp.</b>										
98	0	0	0	-	-	0	0	0	-/-	
03	20	0	100	-	-	0	0	0	3/5	
08	0	0	0	-	-	0	0	0	4/5	
13	0	0	0	-	-	0	0	0	4/10	

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>Pediocactus simpsonii</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	3/5
13	0	0	0	-	-	0	0	0	-/-
<i>Pinus edulis</i>									
98	60	67	33	-	-	0	0	0	-/-
03	20	0	100	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Purshia tridentata</i>									
98	0	0	0	-	-	0	0	0	33/70
03	0	0	0	-	-	0	0	0	27/37
08	0	0	0	-	-	0	0	0	27/34
13	0	0	0	-	-	0	0	0	28/23
<i>Ribes sp.</i>									
98	80	0	100	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	-/-
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Sclerocactus sp.</i>									
98	0	0	0	-	-	0	0	0	-/-
03	0	0	0	-	-	0	0	0	3/7
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-

SUMMIT SPRING - TREND STUDY NO. 30-57



**Location Information**

USGS 7.5 min Map Info Jarvis Peak; Township 42S, Range 18W, Section 33  
 GPS (0' Stake) NAD 83, UTM Zone 12, 244799 East 4108319 North

**Transect Information**

Browse Tag # (0' Stake) 494  
 Transect Bearing 355° magnetic (line 1-2: 355° magnetic, line 3-5: 340° magnetic)  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From Utah Hill Summit, drive 2.9 miles to the Lytle Ranch turnoff, just south of Castle Cliff. Proceed northeast for approximately 1.5 miles to a dirt road on the left (north) that leads to Summit Spring. From the highway, go 0.3 miles to a cattle watering trough and corral. Continue 0.3 miles further to a desert willow on the right (east) side of the road. The 0-foot stake is 45 paces at 20 degrees magnetic from the desert willow. The 0-foot stake has browse tag #494 attached. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.

**Site Information**

Land Ownership BLM  
 Allotment Beaver Dam Slope  
 Elevation 4,270ft (1,301m)  
 Aspect West  
 Slope 30%  
 Sample Dates 05/22/1998, 05/20/2003, 05/07/2008, 05/15/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 57

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Wildfire	Westside Complex	-	2005	68,418
Seeding (Aerial After)	-	-	Winter 2005-2006	-

The table is a recorded disturbance history of the study site.

**Vegetation and Habitat Information**

Big Game Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 57

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1998-2003	Annual Grass/Desert Bitterbrush/Desert Almond	Phase I
2008	Annual Grass-Forb	Phase I
2013	Annual Grass/Desert Almond	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Deer pellet groups have been sampled in high abundance each sampled year, but were not sampled in 2013 (Table - Pellet Group Data). In 2013, a fungus was found on isolated patches red brome (*Bromus rubens*). Grasshoppers were also common on the site in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 12 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Lithic Ustollic Haplargids  
 NRCS Ecological Site Not Available  
 NRCS Ecological Site # Not Available

**SOIL ANALYSIS DATA--**

Management unit 30, Study no: 57

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	66.0	21.4	12.6	6.9	0.5	0.7	10.4	83.2	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site.

When established in 1998, the site was a mixed stand of desert shrubs with desert almond (*Prunus fasciculata*) and blackbrush (*Coleogyne ramosissima*) as the dominant species on the site (Table - Browse Trends). The wildfire, that burned the area in 2005, effectively removed many of the browse species from the site. Desert almond has reestablished on the site and has become the dominant species within the community (Table -

Browse Trends, Table - Browse Characteristics). Since the onset of the study, the invasive annual grass species cheatgrass (*Bromus tectorum*) has remained a dominant component of the understory.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --

Management unit 30, study no: 57

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1994	14.1	-3.9	0.0	3.5	-3.0	2.0	0.0	<b>12.7</b>	Poor
1998	15.5	14.9	3.1	0.0	-16.5	0.5	0.0	<b>17.4</b>	Poor
2003	18.2	11.1	0.3	0.5	-10.4	1.0	0.0	<b>20.6</b>	Poor
2008	2.7	0.0	0.0	0.2	-1.4	1.0	0.0	<b>2.5</b>	Very Poor

#### HERBACEOUS TRENDS--

Management unit 30, Study no: 57

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Aristida purpurea	-	-	2	4	-	-	.00	.18
G	Bouteloua curtipendula	a-	a-	a-	b11	-	-	-	.23
G	Bromus rubens (a)	a-	c90	b33	d160	-	.73	.26	1.27
G	Bromus tectorum (a)	c432	b375	a220	b354	21.98	12.97	1.44	8.35
G	Dactylis glomerata	-	-	-	10	-	-	-	.21
G	Elymus cinereus	a-	a-	a-	b18	-	-	-	.36
G	Munroa squarrosa (a)	a-	a-	a-	b25	-	-	-	.08
G	Oryzopsis hymenoides	-	-	-	-	.00	-	-	-
G	Poa secunda	a-	b17	a5	a-	-	.24	.01	-
G	Sporobolus cryptandrus	a-	a-	b12	b18	-	-	.07	.23
G	Stipa lettermani	-	-	4	-	-	-	.03	-
G	Vulpia octoflora (a)	a4	b28	b32	a6	.00	.18	.14	.02
Total for Annual Grasses		436	493	285	545	21.98	13.89	1.84	9.73
Total for Perennial Grasses		0	17	23	61	0.00	0.24	0.12	1.22
Total for Grasses		436	510	308	606	21.98	14.13	1.96	10.96
F	Aster sp.	6	-	-	-	.04	-	-	-
F	Astragalus nuttallianus (a)	a-	a-	a-	b37	-	-	-	1.03
F	Astragalus sp.	a-	a-	b10	a-	-	-	.02	-
F	Castilleja linariaefolia	-	-	-	3	-	-	-	.03
F	Compositae	-	2	-	-	-	.00	-	-
F	Cryptantha sp.	3	-	4	-	.00	-	.15	-
F	Cryptantha sp.(a)	-	-	3	-	-	-	.00	-
F	Descurainia pinnata (a)	a-	b14	a1	a-	-	.06	.00	-
F	Draba sp. (a)	8	7	6	-	.04	.04	.01	-
F	Eriogonum cernuum (a)	a-	a-	a-	b50	-	-	-	.48
F	Eriogonum racemosum	-	-	-	8	-	-	-	.03
F	Eriogonum sp.	-	4	2	-	-	.15	.00	-
F	Eriogonum umbellatum	a-	a-	a-	b23	-	-	-	.25

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	Eriophyllum wallacei (a)	-	5	-	-	-	.03	-	-
F	Erodium cicutarium (a)	<sub>a</sub> 164	<sub>b</sub> 234	<sub>c</sub> 430	<sub>a</sub> 138	5.59	5.94	27.18	1.96
F	Euphorbia albomarginata	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> 5	<sub>b</sub> 41	-	-	.15	.60
F	Galium sp.	-	3	-	-	-	.03	-	-
F	Gilia sp. (a)	<sub>a</sub> -	<sub>b</sub> 50	<sub>b</sub> 31	<sub>a</sub> -	-	.30	.09	-
F	Lappula occidentalis (a)	<sub>a</sub> -	<sub>b</sub> 25	<sub>a</sub> 3	<sub>a</sub> -	-	.16	.00	-
F	Lygodesmia sp.	-	-	3	3	-	-	.15	.38
F	Microsteris gracilis (a)	2	-	-	-	.00	-	-	-
F	Navarretia intertexta (a)	<sub>a</sub> -	<sub>b</sub> 41	<sub>b</sub> 45	<sub>a</sub> -	-	.52	.18	-
F	Oenothera sp.	-	1	-	-	-	.03	-	-
F	Plantago patagonica (a)	<sub>a</sub> 10	<sub>bc</sub> 47	<sub>ab</sub> 32	<sub>c</sub> 62	.05	.16	.13	.63
F	Prunus fasciculata	-	-	-	-	-	-	-	.15
F	Salvia columbariae	5	-	-	-	.19	-	-	-
F	Sedum lanceolatum	<sub>a</sub> -	<sub>b</sub> 17	<sub>a</sub> -	<sub>a</sub> -	-	.26	-	-
F	Senecio integerrimus	-	-	-	6	-	-	-	.01
F	Unknown forb-annual (a)	<sub>a</sub> -	<sub>b</sub> 33	<sub>a</sub> -	<sub>a</sub> -	-	.22	-	-
Total for Annual Forbs		184	456	551	287	5.68	7.45	27.61	4.11
Total for Perennial Forbs		14	27	24	84	0.23	0.48	0.48	1.46
Total for Forbs		198	483	575	371	5.92	7.94	28.10	5.57

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

#### BROWSE TRENDS--

Management unit 30, Study no: 57

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	Coleogyne ramosissima	-	2.02	-	-	1.65	-	-
B	Echinocereus engelmannii	.03	-	.03	.03	-	-	-
B	Ephedra nevadensis	.18	1.97	-	-	1.56	-	-
B	Ephedra viridis	.47	-	-	-	-	-	-
B	Eriogonum microthecum	.03	-	-	.00	-	-	-
B	Gutierrezia microrcephala	3.47	.31	.15	1.44	.20	.30	2.43
B	Haplopappus linearifolius	4.05	.12	-	-	1.08	-	-
B	Opuntia erinacea	-	-	-	.38	-	-	.06
B	Opuntia sp.	.00	.15	.01	-	-	-	-
B	Opuntia whipplei	-	-	-	.03	-	-	-
B	Prunus fasciculata	4.85	5.06	2.14	4.54	4.88	2.26	6.10
B	Purshia glandulosa	5.73	4.96	.03	.03	4.58	.20	.46
B	Thamnosma montana	.50	1.10	-	-	2.85	-	.28
B	Yucca baccata baccata	2.24	2.42	1.04	2.66	2.83	.70	2.80
Total for Browse		21.59	18.13	3.41	9.13	19.63	3.46	12.13



**BASIC COVER--**

Management unit 30, Study no: 57

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	45.40	36.82	31.62	27.31
Rock	19.41	18.57	18.63	18.62
Pavement	34.65	32.18	25.23	34.07
Litter	27.13	24.01	21.72	19.21
Cryptogams	0	.06	0	0
Bare Ground	6.44	6.24	11.21	11.53

**PELLET GROUP DATA--**

Management unit 30, Study no: 57

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	5	3	4	8	-	-	-	-
Elk	-	-	2	-	-	-	-	-
Deer	28	27	46	2	61 (151)	76 (187)	44 (109)	-
Cattle	1	6	1	-	4 (10)	7 (18)	1 (2)	1 (2)

**BROWSE CHARACTERISTICS--**

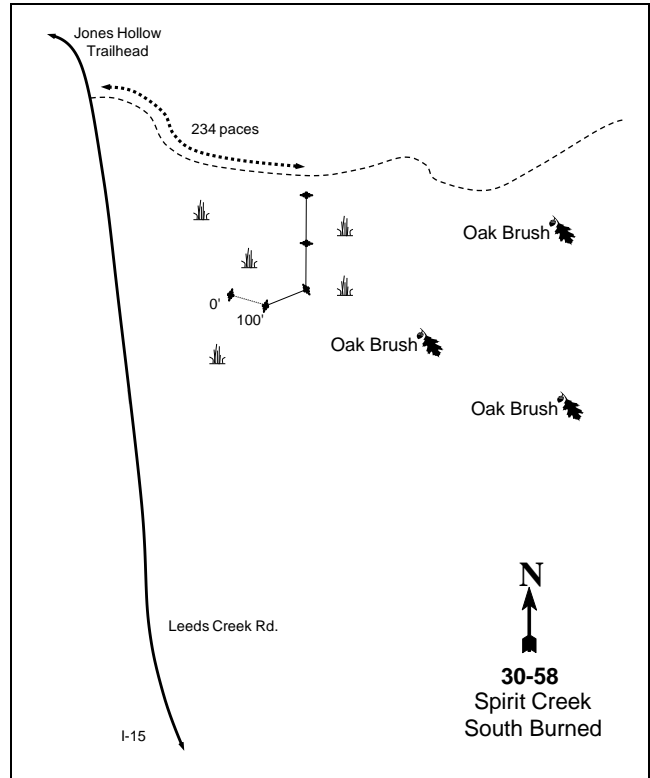
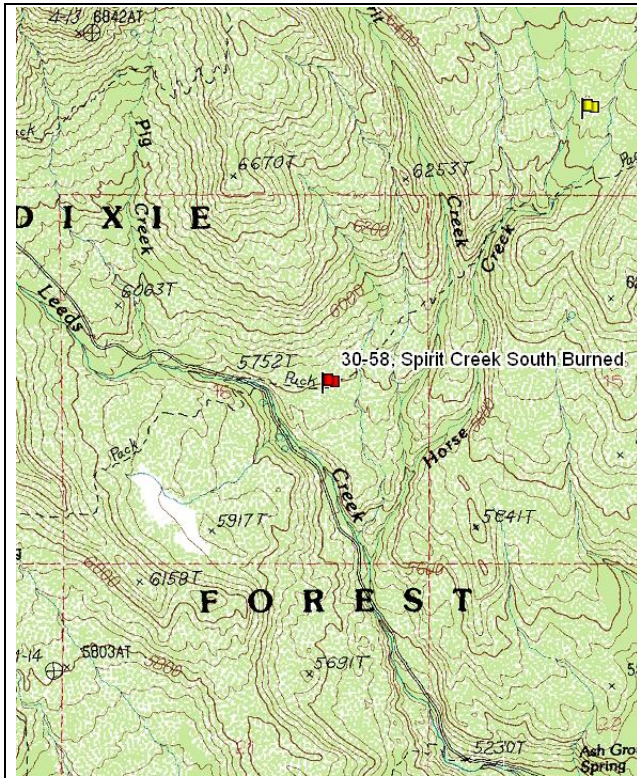
Management unit 30, Study no: 57

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor	
<i>Coleogyne ramosissima</i>									
98	240	0	100	-	80	8	0	0	27/46
03	180	0	100	-	-	89	11	0	32/49
08	0	0	0	-	-	0	0	0	-/-
13	0	0	0	-	-	0	0	0	-/-
<i>Echinocereus engelmannii</i>									
98	20	0	100	-	-	0	0	0	11/9
03	20	0	100	-	-	0	0	0	15/16
08	20	0	100	-	-	0	0	100	6/7
13	0	0	0	-	-	0	0	0	9/14
<i>Ephedra nevadensis</i>									
98	200	40	40	20	-	70	0	20	22/34
03	500	4	88	8	-	24	4	8	19/29
08	0	0	0	0	-	0	0	0	14/15
13	0	0	0	0	-	0	0	0	19/30
<i>Ephedra viridis</i>									
98	480	25	71	4	-	13	0	0	20/23
03	0	0	0	0	-	0	0	0	-/-
08	0	0	0	0	-	0	0	0	-/-
13	0	0	0	0	-	0	0	0	-/-

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Eriogonum microthecum</i>										
98	0	0	0	-	-	0	0	0	18/27	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	100	0	-	-	0	0	0	20/35	
<i>Grayia spinosa</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	18/22	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia microrcephala</i>										
98	1740	8	77	15	100	0	0	11	16/19	
03	340	6	24	71	120	0	0	53	15/15	
08	160	50	50	0	-	0	0	0	12/12	
13	520	23	77	0	40	0	0	0	13/16	
<i>Haplopappus linearifolius</i>										
98	780	13	59	28	20	0	0	5	22/31	
03	200	0	50	50	40	0	0	40	21/27	
08	0	0	0	0	-	0	0	0	9/11	
13	0	0	0	0	-	0	0	0	-/-	
<i>Opuntia echinocarpa</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	23/15	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia erinacea</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	11/21	
<i>Opuntia sp.</i>										
98	20	100	0	-	-	0	0	0	11/12	
03	20	0	100	-	-	0	0	0	12/11	
08	20	0	100	-	20	0	0	0	6/12	
13	0	0	0	-	-	0	0	0	-/-	
<i>Opuntia whipplei</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	20	0	100	-	-	0	0	0	13/6	

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>Prunus fasciculata</i>									
98	<b>180</b>	0	100	0	40	11	0	0	45/67
03	<b>180</b>	0	67	33	-	11	22	11	48/70
08	<b>240</b>	25	75	0	-	0	33	8	26/40
13	<b>520</b>	54	46	0	60	0	0	0	30/48
<i>Purshia glandulosa</i>									
98	<b>220</b>	9	91	0	-	36	0	0	47/64
03	<b>240</b>	0	75	25	-	0	92	8	55/77
08	<b>20</b>	100	0	0	-	0	0	100	13/24
13	<b>20</b>	0	100	-	-	0	0	0	24/41
<i>Rhus trilobata</i>									
98	<b>0</b>	0	0	-	-	0	0	0	-/-
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	40/102
<i>Thamnosma montana</i>									
98	<b>480</b>	8	88	4	20	13	0	4	16/34
03	<b>400</b>	0	85	15	-	0	0	15	17/33
08	<b>20</b>	0	100	0	-	0	0	0	11/21
13	<b>20</b>	0	100	0	-	0	0	0	17/33
<i>Yucca baccata baccata</i>									
98	<b>740</b>	0	86	14	-	0	0	8	31/39
03	<b>800</b>	0	100	0	-	0	0	0	30/39
08	<b>420</b>	0	95	5	-	0	29	33	23/30
13	<b>740</b>	3	97	0	-	0	0	0	26/31

SPIRIT CREEK SOUTH - TREND STUDY NO. 30-58



**Location Information**

USGS 7.5 min Map Info Signal Peak; Township 40S, Range 14W, Section 16  
 GPS (0' Stake) NAD 83, UTM Zone 12, 284966 East 4131911 North

**Transect Information**

Browse Tag # (0' Stake) Not Available  
 Transect Bearing 111° magnetic (line 2: 94°magnetic, line 3-4: 15°magnetic)  
 Length 400ft  
 Belt Placement Line 1 (11ft & 95ft), Line 2 (59ft), Line 3 (71ft), Line 4 (34ft)  
 Belt Marker Placement No Rebar

**Directions to Site**

Traveling south on I-15 from Cedar City, take the first Leeds exit #23 (If traveling north, there is no off ramp at exit #23 take exit #22 and the frontage road to exit #23). Travel northwest on the Leeds Creek Road for 3.25 miles, and stay to the right at the fork and proceed about 4.0 miles towards the Oak Grove campground. Stop just past a bridge at the Jones Hollow (Blake-Harmony) trail head. Hike 234 paces up the trail to a 4-foot tall green fence post 75 feet southwest (212°M) of the trail. This is the 0-foot baseline stake. All stakes are 4 foot tall green fence posts.

**Site Information**

Land Ownership Private  
 Allotment No Allotment  
 Elevation 5,780ft (1,762m)  
 Aspect Southeast  
 Slope 5%  
 Sample Dates 09/16/1986, 09/20/1987, 06/02/1992, 06/04/1998, 06/03/2003, 05/28/2008, 05/13/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 58

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	-	-	Jun. 1986	-
Seeding	-	-	Jul. 1986	-

The table is a recorded disturbance history of the study site.

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 58

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
1986-1998	Perennial Grass	Phase I
2003-2013	Perennial Grass/Gambel Oak/Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The flat were the site is located once maintained a population of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) prior to the wildfire in 1986. In 1992, deer pellet groups were sampled in high abundance that suggested the area was considered to be an important mule deer fawning habitat (Jense, et al., 1992). Deer pellet groups have varied widely in abundance since 1998 (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 18 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Mountain Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB430UT

**SOIL ANALYSIS DATA--**

Management unit 30-58, Study no: 58

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	64.0	21.4	14.6	6.1	0.7	1.8	15.3	176.0	1998

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

**States and Transitions**

No state and transition model is available for the above ecological site, but it is likely similar to the [Mountain Loam \(Mountain Big Sagebrush\), R047XA430UT](#) ecological site that does have a defined state and transition model (USDA-NRCS, 2011).

Since establishment in 1987, the site has maintained a dominant community of introduced perennial grass species that has consisted mainly of intermediate wheatgrass (*Agropyron intermedium*) and crested wheatgrass (*A. cristatum*). The invasive annual grass cheatgrass (*Bromus tectorum*) has been sampled on the site since

1998, but was likely present prior to this time. Since 1998, Gambel oak and mountain big sagebrush have increased in dominance on the site (Table - Browse Trends). The study site appears to be stable, and will likely remain stable without further disturbance.

### Trend Summary

#### DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 30, study no: 58

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
1998	5.7	12.2	14.5	30.0	-1.7	10.0	0.0	<b>70.8</b>	Good
2003	3.3	0.0	0.0	20.1	-1.3	8.3	0.0	<b>30.3</b>	Very Poor
2008	5.9	10.7	7.2	30.0	-0.2	6.3	0.0	<b>59.9</b>	Fair
2013	10.9	12.4	15.0	30.0	-0.2	10.0	0.0	<b>78.1</b>	Good-Excellent

#### HERBACEOUS TRENDS--

Management unit 30, Study no: 58

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
G	Agropyron cristatum	c228	b139	a58	a58	9.51	6.76	2.17	2.49
G	Agropyron intermedium	c357	a241	ab273	b291	22.76	9.99	13.18	12.34
G	Bromus inermis	b184	a129	ab177	c252	4.42	3.32	6.51	14.10
G	Bromus tectorum (a)	c227	ab49	b62	a18	1.82	.53	.20	.20
G	Festuca ovina	5	-	-	-	.18	-	-	-
G	Poa fendleriana	2	-	1	7	.15	-	.00	.06
G	Poa pratensis	-	-	3	-	.00	-	.15	-
G	Sitanion hystrix	1	1	-	-	.03	.00	-	-
G	Vulpia octoflora (a)	a39	b71	a12	a11	.40	1.25	.03	.02
Total for Annual Grasses		266	120	74	29	2.22	1.78	0.23	0.22
Total for Perennial Grasses		777	510	512	608	37.07	20.07	22.02	29.00
Total for Grasses		1043	630	586	637	39.30	21.86	22.25	29.22
F	Agoseris glauca	10	-	-	-	.04	-	-	-
F	Alyssum alyssoides (a)	a-	a-	b17	b14	-	-	.42	.02
F	Arabis sp.	-	-	-	4	-	-	-	.00
F	Calochortus nuttallii	-	3	-	-	-	.01	-	-
F	Camelina microcarpa (a)	-	1	-	-	-	.00	-	-
F	Chenopodium sp. (a)	-	2	-	-	-	.00	-	-
F	Cymopterus sp.	5	6	3	8	.02	.01	.01	.02
F	Draba sp. (a)	b22	c43	a1	a-	.09	.19	.00	-
F	Dracocephalum parviflorum	-	1	-	-	-	.03	-	-
F	Erodium cicutarium (a)	-	2	-	-	-	.07	-	-
F	Euphorbia sp.	9	28	17	13	.06	.56	.09	.05
F	Gilia sp. (a)	a-	c49	b10	a-	-	.55	.02	-
F	Lotus utahensis	a6	a3	a12	b28	.33	.01	.57	.26
F	Medicago sativa	a43	b89	ab55	b81	7.13	3.40	2.29	6.41
F	Melilotus officinalis	-	6	-	-	-	.01	-	-

Type	Species	Nested Frequency				Average Cover %			
		'98	'03	'08	'13	'98	'03	'08	'13
F	<i>Microsteris gracilis</i> (a)	<sub>c</sub> 198	<sub>d</sub> 293	<sub>b</sub> 132	<sub>a</sub> 50	1.00	10.71	.39	.14
F	<i>Sphaeralcea grossulariifolia</i>	<sub>a</sub> -	<sub>b</sub> 19	<sub>b</sub> 8	<sub>ab</sub> 3	-	.09	.21	.04
F	<i>Tragopogon dubius</i> (a)	-	4	-	-	-	.00	-	-
F	<i>Zigadenus paniculatus</i>	-	-	-	-	-	-	-	.00
Total for Annual Forbs		220	394	160	64	1.09	11.56	0.84	0.16
Total for Perennial Forbs		73	155	95	137	7.59	4.13	3.17	6.80
Total for Forbs		293	549	255	201	8.69	15.69	4.02	6.96

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

### BROWSE TRENDS--

Management unit 30, Study no: 58

Type	Species	Quadrat Cover %				Line Intercept Cover%		
		'98	'03	'08	'13	'03	'08	'13
B	<i>Arctostaphylos patula</i>	.03	.15	.63	1.01	.36	.75	1.16
B	<i>Artemisia tridentata vaseyana</i>	.45	1.04	1.10	3.32	1.93	3.91	4.83
B	<i>Gutierrezia sarothrae</i>	.15	-	-	-	-	-	-
B	<i>Opuntia</i> sp.	.30	-	-	-	-	-	-
B	<i>Quercus gambelii</i>	5.15	1.98	4.49	6.70	4.43	7.23	11.60
B	<i>Quercus turbinella</i>	.03	.18	.15	.38	-	-	.10
Total for Browse		6.11	3.35	6.37	11.41	6.72	11.89	17.69

### BASIC COVER--

Management unit 30, Study no: 58

Cover Type	Average Cover %			
	'98	'03	'08	'13
Vegetation	55.70	43.92	31.24	48.87
Rock	.02	0	0	0
Pavement	.51	.24	.39	.02
Litter	68.34	58.87	64.89	74.86
Cryptogams	.46	.17	.44	.18
Bare Ground	18.20	13.81	18.42	7.78

### PELLET GROUP DATA--

Management unit 30, Study no: 58

Type	Quadrat Frequency				Days use per acre (ha)			
	'98	'03	'08	'13	'98	'03	'08	'13
Rabbit	1	8	65	25	-	-	-	-
Elk	-	-	-	-	-	-	1 (2)	-
Deer	55	30	25	6	76 (188)	17 (43)	162 (400)	11 (28)

BROWSE CHARACTERISTICS--

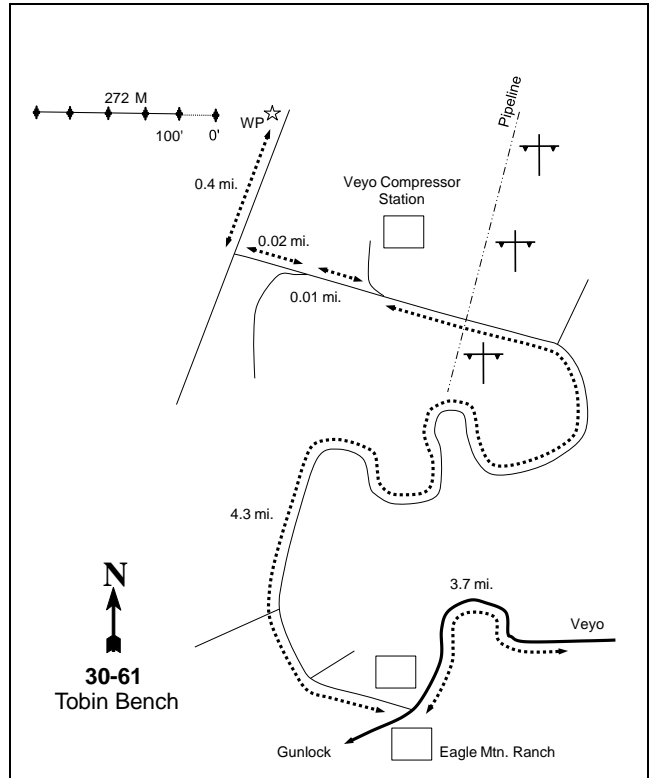
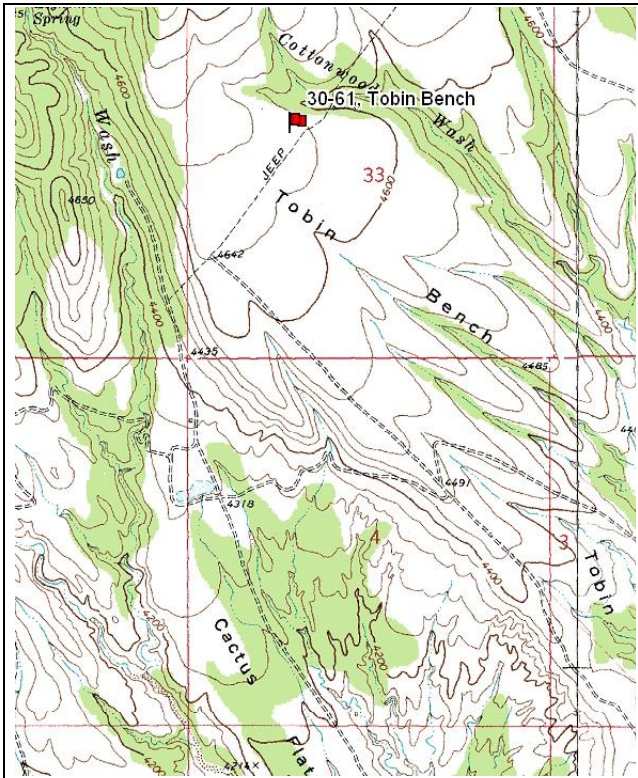
Management unit 30, Study no: 58

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Amelanchier utahensis</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	35/48	
13	0	0	0	-	-	0	0	0	19/19	
<i>Arctostaphylos patula</i>										
98	40	0	100	-	-	50	0	0	14/19	
03	20	0	100	-	-	0	0	0	30/55	
08	20	0	100	-	-	0	0	0	39/52	
13	40	50	50	-	-	0	0	0	37/65	
<i>Artemisia tridentata vaseyana</i>										
98	340	18	59	24	-	18	0	18	17/24	
03	280	0	100	0	-	0	0	0	31/38	
08	340	0	88	12	380	6	6	0	37/51	
13	700	57	29	14	80	11	0	11	27/50	
<i>Ceanothus greggii</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	52/69	
08	0	0	0	-	-	0	0	0	35/58	
13	0	0	0	-	-	0	0	0	41/81	
<i>Chrysothamnus parryi</i>										
98	0	0	0	-	-	0	0	0	-/-	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	6/15	
13	0	0	0	-	-	0	0	0	-/-	
<i>Eriodictyon angustifolium</i>										
98	0	0	0	-	-	0	0	0	13/13	
03	0	0	0	-	-	0	0	0	-/-	
08	0	0	0	-	-	0	0	0	-/-	
13	0	0	0	-	-	0	0	0	-/-	
<i>Gutierrezia sarothrae</i>										
98	120	0	100	-	-	0	0	0	6/12	
03	20	0	100	-	-	0	0	0	6/6	
08	0	0	0	-	-	0	0	0	6/9	
13	0	0	0	-	-	0	0	0	8/12	
<i>Opuntia sp.</i>										
98	40	0	100	-	-	100	0	100	8/22	
03	0	0	0	-	-	0	0	0	11/11	
08	0	0	0	-	-	0	0	0	12/20	
13	0	0	0	-	-	0	0	0	-/-	



		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Purshia tridentata</i>										
98	<b>0</b>	0	0	-	-	0	0	0	-/-	
03	<b>0</b>	0	0	-	-	0	0	0	25/40	
08	<b>0</b>	0	0	-	-	0	0	0	26/80	
13	<b>0</b>	0	0	-	-	0	0	0	34/97	
<i>Quercus gambelii</i>										
98	<b>2000</b>	30	62	8	60	5	0	0	45/48	
03	<b>2740</b>	41	39	20	60	3	0	1	44/24	
08	<b>2620</b>	18	67	15	40	6	5	8	74/41	
13	<b>1920</b>	29	65	6	60	23	0	18	41/23	
<i>Quercus turbinella</i>										
98	<b>80</b>	25	25	50	-	0	0	50	50/59	
03	<b>20</b>	0	0	100	20	0	0	100	51/46	
08	<b>40</b>	0	0	100	-	0	50	50	74/82	
13	<b>60</b>	33	33	33	-	0	33	33	60/70	

TOBIN BENCH - TREND STUDY NO. 30-61



**Location Information**

USGS 7.5 min Map Info Gunlock; Township 39S, Range 17W, Section 33  
 GPS (0' Stake) NAD 83, UTM Zone 12, 255113 East 4137729 North

**Transect Information**

Browse Tag # (0' Stake) 244  
 Transect Bearing 272° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

Drive west from Veyo on Center St. for 5.7 miles to a road on the right (north) side of the road. The Eagle Mountain Ranch will be on the left side of the road at this turn. Drive on this oiled road for 4.3 miles to Veyo Compressor Station and a fork in the road. Take the left fork for 0.01 miles to another fork. Stay right and drive 0.02 miles to an intersection and a wire gate. Turn right and drive 0.4 miles on an old powerline road to the witness post on the left side of the road. The 0-foot stake is 7 paces at 306 degrees magnetic from the witness post. The baseline runs approximately west. The study is marked by green steel "T" fence posts approximately 12 to 14 inches in height with browse tag number 244.

**Site Information**

Land Ownership BLM  
 Allotment Minera Wash  
 Elevation 4,650ft (1,417m)  
 Aspect East  
 Slope 3%  
 Sample Dates 05/27/2003, 05/14/2008, 05/21/2013

**DISTURBANCE HISTORY--**

Management unit 30, Study no: 61

Treatment/Disturbance	Name	WRI DB #	Date	Size (acres)
Fire	Bull Complex		2006	41,500
Seeding	Tobin Bench Fire Rehabilitation	<a href="#">611</a>	2006	1,000

The table is a recorded disturbance history of the study site.

**SEED MIX--**

Management unit 30, Study no: 61

Project Name: Tobin Bench Fire Rehabilitation			
WRI Database #: <a href="#">611</a>			
Application: Dribbler		Acres: 1,000	
Seed type		lbs in mix	lbs/acre
B	Fourwing Saltbush--Lincoln	500	0.50
B	Stansbury Cliffrose	214	0.21
B	Stansbury Cliffrose--Millard	200	0.20
Total Pounds:		914	0.91
PLS Pounds:			472.72

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

**VEGETATION HISTORY--**

Management unit 30, Study no: 61

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2003	Stansbury Cliffrose	Phase I
2008	Annual Forb	Phase I
2013	Annual Forb/Stansbury Cliffrose/Broom Snakeweed	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

The Tobin Bench Fire Rehabilitation was a seeding that took place in response to the Bull Wildfire Complex, which removed much of the vegetation on the site. In 2006, Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) and fourwing saltbush (*Atriplex confertifolia*) were seeded to increase forage value, augmenting the loss of preferred browse species. However, there is some discrepancy as to whether or not an additional seed mix of herbaceous species was applied in 2009. Deer pellet groups were sampled in high abundance in 2003, but following the wildfire deer pellet group have decreased considerably and have been sampled in low abundance (Table - Pellet Group Data). An old deer antler shed was found on site in 2013.

**Site Potential**

1981-2010 Average Annual Precipitation 13 inches  
 NRCS Taxonomical soil Classification Clayey, montmorillonitic, mesic, shallow Petrocalcic Paleustolls  
 NRCS Ecological Site Not Available  
 NRCS Ecological Site # Not Available

SOIL ANALYSIS DATA--

Management unit 30, Study no: 61

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Clay Loam	58.6	14.7	26.7	7.1	0.6	1.3	10.3	486.4	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

States and Transitions

No state and transition model is available for the above ecological site.

When established in 2003, Stansbury cliffrose dominated the site. Additionally, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) was experiencing a die-off that was likely due to drought. It was observed that in 2008 the Bull Wildfire Complex had effectively removed much of the browse component from the area with a decrease in cliffrose cover (Table - Browse Trends). Since 2008, the weedy annual forb species storksbill (*Erodium cicutarium*) comprised much of the herbaceous understory and is indicative of a degraded ecological state, but does provide some forage value to wildlife. As of 2013, cliffrose was reestablished on the site and was the dominant species within the community.

Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --

Management unit 30, study no: 61

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2003	18.6	-6.8	1.1	0.1	0.0	6.5	0.0	19.5	Very Poor
2008	1.7	0.4	0.0	0.1	0.0	1.6	0.0	3.8	Very Poor
2013	10.6	15.0	0.0	0.5	0.0	0.0	0.0	26.1	Very Poor

HERBACEOUS TRENDS--

Management unit 30, Study no: 61

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Agropyron cristatum	a-	a <sup>2</sup>	b <sup>16</sup>	-	.00	.21
G	Agropyron intermedium	2	-	1	.03	-	.01
G	Bromus tectorum (a)	a-	ab <sup>6</sup>	b <sup>15</sup>	-	.02	.03
G	Sitanion hystrix	7	7	5	.01	.04	.03
G	Vulpia octoflora (a)	-	4	-	-	.01	-
Total for Annual Grasses		0	10	15	0	0.03	0.03
Total for Perennial Grasses		9	9	22	0.04	0.04	0.26
Total for Grasses		9	19	37	0.04	0.08	0.29
F	Alyssum desertorum (a)	-	1	-	-	.03	-
F	Aster sp.	1	-	-	.00	-	-
F	Calochortus flexuosus	b <sup>37</sup>	b <sup>13</sup>	a-	.37	.08	-
F	Chenopodium fremontii (a)	-	6	-	-	.01	-
F	Descurainia pinnata (a)	a-	b <sup>85</sup>	a <sup>1</sup>	-	1.25	.00
F	Eriogonum cernuum (a)	-	-	4	-	-	.38

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
F	<i>Erodium cicutarium</i> (a)	a <sup>-</sup>	b <sup>316</sup>	b <sup>352</sup>	-	37.63	7.58
F	<i>Euphorbia</i> sp.	b <sup>46</sup>	c <sup>121</sup>	a <sup>1</sup>	2.89	.62	.00
F	<i>Lappula occidentalis</i> (a)	a <sup>-</sup>	b <sup>34</sup>	a <sup>1</sup>	-	.57	.00
F	<i>Navarretia intertexta</i> (a)	a <sup>2</sup>	b <sup>104</sup>	a <sup>-</sup>	.03	.52	-
F	<i>Salsola iberica</i> (a)	a <sup>-</sup>	b <sup>67</sup>	a <sup>-</sup>	-	.13	-
F	<i>Sisymbrium altissimum</i> (a)	a <sup>-</sup>	b <sup>104</sup>	a <sup>-</sup>	-	7.53	-
F	<i>Sphaeralcea grossulariifolia</i>	-	4	2	-	.11	.00
Total for Annual Forbs		2	717	358	0.03	47.68	7.97
Total for Perennial Forbs		84	138	3	3.27	0.81	0.01
Total for Forbs		86	855	361	3.30	48.49	7.99

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

#### BROWSE TRENDS--

Management unit 30, Study no: 61

Type	Species	Quadrat Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	<i>Artemisia tridentata vaseyana</i>	6.12	-	-	.93	-	-
B	<i>Cowania mexicana stansburiana</i>	7.29	1.13	7.05	7.88	1.33	7.10
B	<i>Gutierrezia sarothrae</i>	-	.15	3.07	-	-	5.33
B	<i>Kochia prostrata</i>	-	.03	-	-	-	-
B	<i>Quercus turbinella</i>	.53	-	.63	1.36	-	1.18
Total for Browse		13.94	1.31	10.75	10.17	1.33	13.61

#### BASIC COVER--

Management unit 30, Study no: 61

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	17.18	49.00	18.64
Rock	7.96	11.91	14.00
Pavement	9.61	7.57	2.17
Litter	50.40	13.06	26.35
Cryptogams	.09	.01	1.48
Bare Ground	23.35	31.44	45.37

#### PELLET GROUP DATA--

Management unit 30, Study no: 61

Type	Quadrat Frequency		
	'03	'08	'13
Rabbit	7	36	22
Elk	-	-	-
Deer	50	40	20

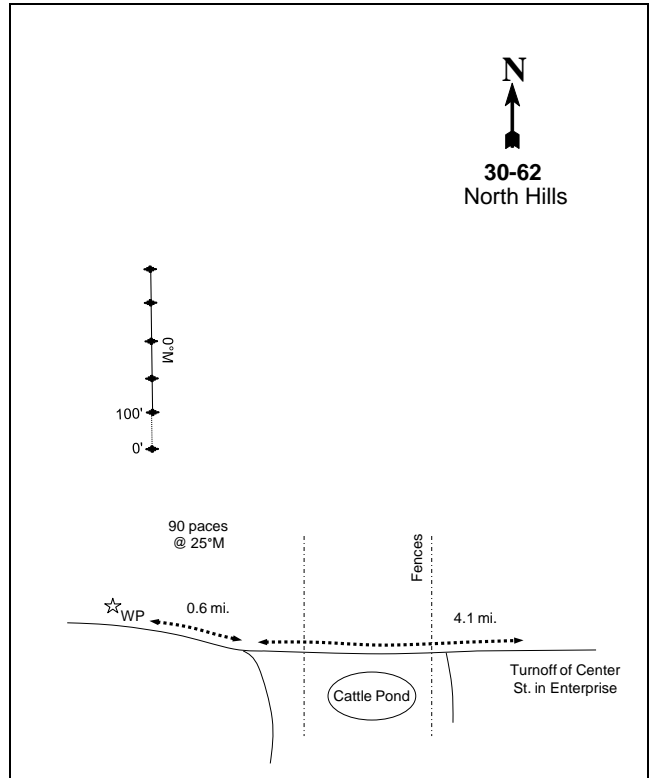
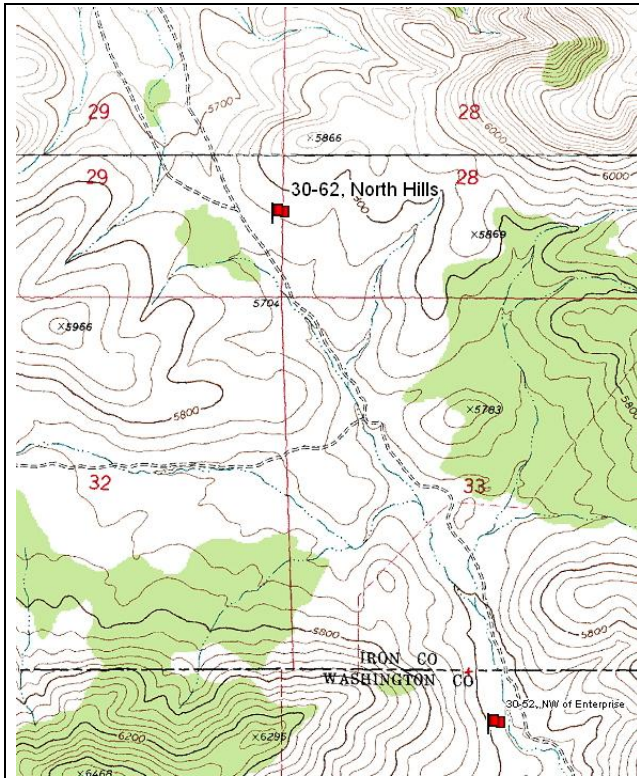
Days use per acre (ha)		
'03	'08	'13
-	-	-
-	1 (3)	-
225 (555)	42 (103)	23 (56)

BROWSE CHARACTERISTICS--

Management unit 30, Study no: 61

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 vaseyana</i>									
03	<b>620</b>	0	3	97	-	32	16	74	31/41
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Coryphantha vivipara</i>									
03	<b>0</b>	0	0	-	-	0	0	0	6/5
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Cowania mexicana stansburiana</i>									
03	<b>500</b>	4	44	52	20	24	48	8	57/67
08	<b>300</b>	13	87	0	20	0	7	80	16/21
13	<b>340</b>	0	100	0	-	29	0	6	25/42
<i>Ephedra viridis</i>									
03	<b>0</b>	0	0	-	-	0	0	0	30/34
08	<b>0</b>	0	0	-	-	0	0	0	10/7
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Gutierrezia sarothrae</i>									
03	<b>0</b>	0	0	0	-	0	0	0	-/-
08	<b>200</b>	0	100	0	-	0	0	0	10/9
13	<b>7360</b>	8	91	1	-	0	0	.27	7/9
<i>Kochia prostrata</i>									
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>40</b>	50	50	-	-	0	0	0	9/6
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Opuntia sp.</i>									
03	<b>0</b>	0	0	-	-	0	0	0	13/26
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Quercus turbinella</i>									
03	<b>240</b>	0	100	-	-	0	0	0	52/44
08	<b>220</b>	0	100	-	-	0	0	100	19/16
13	<b>20</b>	0	100	-	-	0	0	0	49/80
<i>Sclerocactus sp.</i>									
03	<b>0</b>	0	0	-	-	0	0	0	11/11
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-

NORTH HILLS - TREND STUDY NO. 30-62



**Location Information**

USGS 7.5 min Map Info Hebron; Township 36S, Range 17W, Section 29  
 GPS (0' Stake) NAD 83, UTM Zone 12, 255292 East 4167605 North

**Transect Information**

Browse Tag # (0' Stake) 434  
 Transect Bearing 0° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

Starting from the town of Enterprise, turn north on 2nd West and pass over a bridge. From the bridge, drive 0.6 miles to just past 375 West and turn right on Old Modena Rd right before a fire hydrant. On Old Modena Rd., travel 4.1 miles passing study 30-52 and a couple of fences to a fork on the left. Continue straight on the road for another 0.6 miles to the witness post on the right side of the road. The 0-foot stake is 90 paces at 25 degrees magnetic. The 0-foot stake is marked by browse tag # 434. The study is marked by green steel "T" fence posts approximately 12 to 14 inches in height.

**Site Information**

Land Ownership BLM  
 Allotment County Line  
 Elevation 5,770ft (1,759m)  
 Aspect Southwest  
 Slope 11%  
 Sample Dates 05/29/2003, 05/22/2008, 05/23/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

VEGETATION HISTORY--

Management unit 30, Study no: 62

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2003-2013	Mountain Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Many mature cliffrose on the site are highlined and are mostly unavailable to big game wildlife. The abundance of deer pellet groups has varied widely over the duration of the study (Table - Pellet Group Data).

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Loamy-skeletal, mixed, mesic Lithic Xeric Haplargids  
 NRCS Ecological Site Semidesert Shallow Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY243UT

SOIL ANALYSIS DATA--

Management unit 30, Study no: 62

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Clay Loam	34.6	36.7	28.7	7.1	0.4	1.3	5.1	422.4	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site.

Since establishment in 2003, the site has maintained a stable stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) that has dominated the site, and a sparse population of Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*). The herbaceous understory is moderately diverse, but sparse community of perennial grasses and forbs. However, the invasive annual grass cheatgrass (*Bromus tectorum*) has dominated the understory over the duration of the study (Table - Browse Trends; Table - Herbaceous Trends). If cheatgrass increased, it could fill in the interspaces creating a continuous fuel, increasing the potential for fire.



## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
Management unit 30, study no: 62

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2003	18.4	2.1	2.9	4.0	-3.5	0.6	0.0	<b>24.4</b>	Very Poor
2008	24.3	2.6	0.0	12.0	-9.4	0.3	0.0	<b>29.8</b>	Very Poor
2013	23.3	5.6	0.5	4.6	-3.2	0.2	0.0	<b>30.9</b>	Very Poor

HERBACEOUS TRENDS--  
Management unit 30, Study no: 62

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	Bromus japonicus (a)	1	-	-	.00	-	-
G	Bromus tectorum (a)	<sub>a</sub> 174	<sub>c</sub> 389	<sub>b</sub> 346	4.39	12.34	4.28
G	Hilaria jamesii	<sub>a</sub> 81	<sub>b</sub> 121	<sub>a</sub> 83	1.36	4.38	1.37
G	Oryzopsis hymenoides	<sub>b</sub> 11	<sub>ab</sub> 1	<sub>a</sub> -	.19	.00	-
G	Poa fendleriana	<sub>a</sub> 5	<sub>b</sub> 23	<sub>ab</sub> 15	.04	.41	.45
G	Poa secunda	14	7	16	.11	.10	.23
G	Sitanion hystrix	<sub>b</sub> 49	<sub>b</sub> 47	<sub>a</sub> 20	.29	1.09	.25
G	Vulpia octoflora (a)	<sub>c</sub> 86	<sub>b</sub> 61	<sub>a</sub> -	.32	.13	-
Total for Annual Grasses		261	450	346	4.72	12.47	4.28
Total for Perennial Grasses		160	199	134	2.01	5.99	2.31
Total for Grasses		421	649	480	6.73	18.46	6.59
F	Astragalus sp.	-	3	-	-	.01	.03
F	Brodiaea pulchella	<sub>a</sub> -	<sub>b</sub> 26	<sub>a</sub> -	-	.06	-
F	Calochortus nuttallii	12	6	-	.02	.01	-
F	Collinsia parviflora (a)	<sub>a</sub> -	<sub>c</sub> 43	<sub>b</sub> 15	-	.11	.03
F	Compositae	<sub>ab</sub> 5	<sub>b</sub> 12	<sub>a</sub> -	.21	.03	-
F	Descurainia pinnata (a)	-	2	-	-	.00	-
F	Draba sp. (a)	<sub>a</sub> 5	<sub>b</sub> 27	<sub>a</sub> -	.01	.06	-
F	Erodium cicutarium (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 8	-	-	.05
F	Gilia sp. (a)	<sub>b</sub> 25	<sub>b</sub> 14	<sub>a</sub> -	.13	.03	-
F	Lupinus argenteus	3	-	-	.01	-	-
F	Lupinus sp. (a)	<sub>a</sub> -	<sub>b</sub> 19	<sub>a</sub> 4	-	.05	.03
F	Mentzelia sp.	<sub>a</sub> -	<sub>b</sub> 16	<sub>a</sub> -	-	.03	-
F	Microseris lindleyi	-	1	-	-	.00	-
F	Microsteris gracilis (a)	<sub>a</sub> 2	<sub>b</sub> 27	<sub>c</sub> 63	.01	.06	.15
F	Navarretia intertexta (a)	<sub>ab</sub> 32	<sub>b</sub> 40	<sub>a</sub> 18	.19	.10	.03
F	Phlox longifolia	2	-	3	.00	-	.03
F	Ranunculus testiculatus (a)	-	-	2	-	-	.00
F	Sphaeralcea grossulariifolia	4	5	4	.04	.01	.04
Total for Annual Forbs		64	172	110	0.35	0.44	0.31
Total for Perennial Forbs		26	69	7	0.29	0.16	0.10

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
Total for Forbs		90	241	117	0.64	0.60	0.41

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

#### BROWSE TRENDS--

Management unit 30, Study no: 62

Type	Species	Quadrat Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	Artemisia tridentata vaseyana	13.61	17.48	16.94	16.11	17.88	17.63
B	Cowania mexicana stansburiana	.30	1.66	1.39	.58	.90	1.21
B	Gutierrezia sarothrae	1.56	1.27	.62	1.56	.73	1.03
B	Purshia tridentata	.63	-	-	.33	-	-
Total for Browse		16.11	20.42	18.95	18.58	19.51	19.87

#### POINT-QUARTER TREE DATA--

Management unit 30, Study no: 62

Species	Trees per Acre			Average diameter (in)		
	'03	'08	'13	'03	'08	'13
Juniperus osteosperma	<18	19	20	-	6.4	4

#### BASIC COVER--

Management unit 30, Study no: 62

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	28.16	38.67	26.28
Rock	19.44	21.10	14.56
Pavement	12.29	11.91	6.34
Litter	36.87	39.17	62.61
Cryptogams	.07	.43	.04
Bare Ground	11.86	7.60	6.18

#### PELLET GROUP DATA--

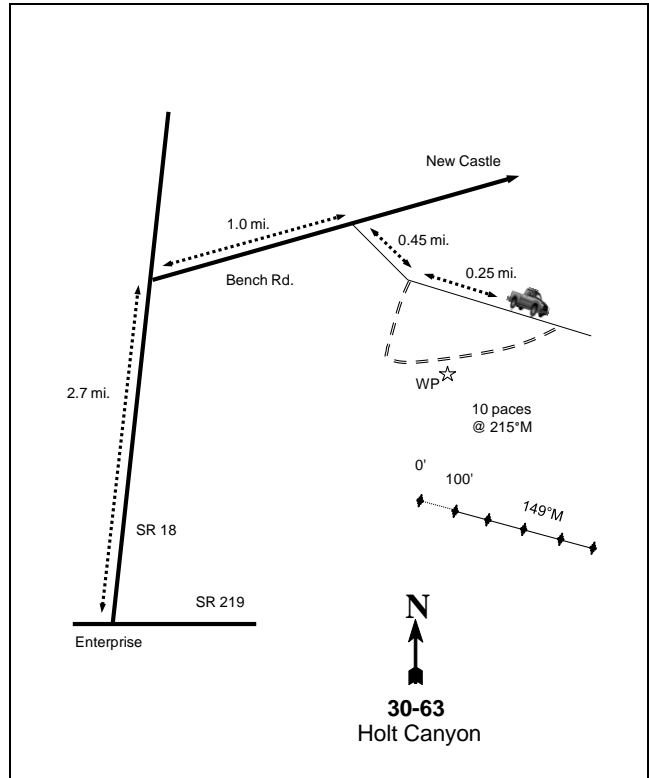
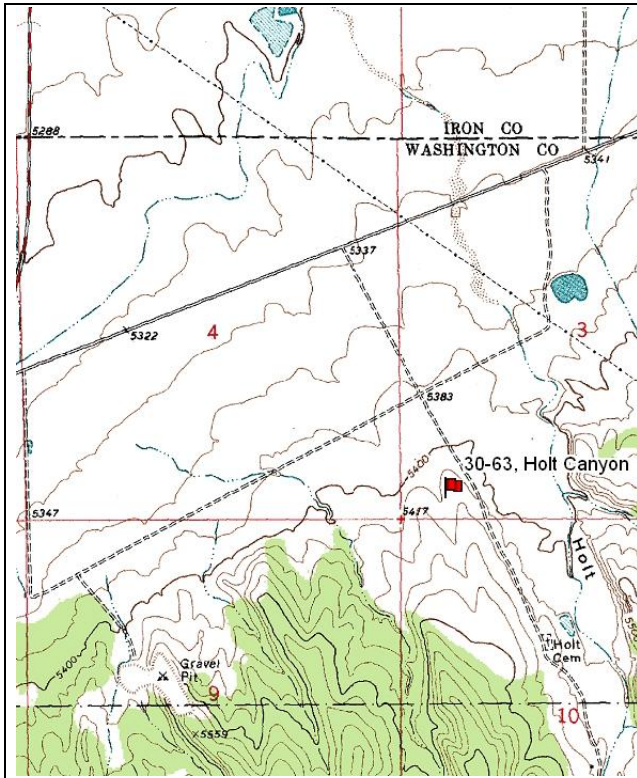
Management unit 30, Study no: 62

Type	Quadrat Frequency			Days use per acre (ha)		
	'03	'08	'13	'03	'08	'13
Rabbit	31	70	13	-	-	-
Horse	-	2	-	-	1 (1)	-
Elk	-	1	-	-	-	-
Deer	19	36	5	25 (63)	41 (101)	9 (23)
Cattle	-	2	2	-	-	-

BROWSE CHARACTERISTICS--  
Management unit 30, Study no: 62

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 vaseyana</i>									
03	<b>3380</b>	1	53	46	20	22	8	20	23/31
08	<b>2740</b>	0	60	40	80	21	4	16	24/38
13	<b>2480</b>	1	67	32	-	52	6	18	22/32
<i>Chrysothamnus parryi</i>									
03	<b>0</b>	0	0	-	-	0	0	0	6/15
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Coryphantha vivipara</i>									
03	<b>20</b>	0	100	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	-/-
<i>Cowania mexicana stansburiana</i>									
03	<b>80</b>	25	75	0	20	25	75	0	57/50
08	<b>140</b>	0	43	57	20	0	71	29	70/67
13	<b>80</b>	0	75	25	-	50	25	0	37/36
<i>Ephedra viridis</i>									
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	27/45
13	<b>0</b>	0	0	-	-	0	0	0	25/40
<i>Gutierrezia sarothrae</i>									
03	<b>2480</b>	2	94	5	40	0	0	.80	8/10
08	<b>4060</b>	2	93	5	1980	.49	0	2	5/6
13	<b>1460</b>	5	92	3	20	0	0	5	7/9
<i>Opuntia sp.</i>									
03	<b>0</b>	0	0	-	-	0	0	0	-/-
08	<b>0</b>	0	0	-	-	0	0	0	-/-
13	<b>0</b>	0	0	-	-	0	0	0	7/11
<i>Purshia tridentata</i>									
03	<b>20</b>	0	0	100	-	0	100	100	10/21
08	<b>0</b>	0	0	0	-	0	0	0	-/-
13	<b>0</b>	0	0	0	-	0	0	0	-/-
<i>Yucca sp.</i>									
03	<b>0</b>	0	0	-	-	0	0	0	28/35
08	<b>0</b>	0	0	-	-	0	0	0	28/30
13	<b>0</b>	0	0	-	-	0	0	0	23/27

HOLT CANYON - TREND STUDY NO. 30-63



**Location Information**

USGS 7.5 min Map Info Enterprise; Township 37S, Range 16W, Section 03  
 GPS (0' Stake) NAD 83, UTM Zone 12, 266848 East 4163765 North

**Transect Information**

Browse Tag # (0' Stake) 142  
 Transect Bearing 149° magnetic  
 Length 500ft  
 Belt Placement Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
 Belt Marker Placement Standard

**Directions to Site**

From Enterprise, drive east on Highway 18 for 2.7 miles to Bench Rd. Turn RIGHT and drive approximately 1.0 mile to Holt Canyon Road, there is a sign. Drive on Holt Canyon Rd. for 0.45 miles to an intersection. Continue straight for 0.25 miles and park. Walk up the hill to the west and look for a full high witness post next to a faint road. From the witness post, the 0-foot stake is 10 paces at 215 degrees magnetic. The 0-foot stake is marked by browse tag #142. The study is marked by green steel "T" fence posts approximately 12 to 14 inches in height.

**Site Information**

Land Ownership Private  
 Allotment Not Applicable  
 Elevation 5,430ft (1,655m)  
 Aspect Southwest  
 Slope 11-14%  
 Sample Dates 06/02/2003, 05/08/2008, 05/23/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Substantial Winter

VEGETATION HISTORY--

Management unit 22, Study no: 1

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2003-2013	Wyoming Big Sagebrush	Phase I

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

Little to no livestock presence has been recorded on the site, and deer pellet groups have been sampled in low abundance since 2003 (Table - Pellet Group Data). In 2013, insect galls were observed on many of the sagebrush plants.

**Site Potential**

1981-2010 Average Annual Precipitation 14 inches  
 NRCS Taxonomical soil Classification Not Available  
 NRCS Ecological Site Semidesert Loam (Wyoming Big Sagebrush)  
 NRCS Ecological Site # R028AY220UT

SOIL ANALYSIS DATA--

Management unit 30, Study no: 63

Texture	Sand (%)	Silt (%)	Clay (%)	pH	ds/m	OM (%)	PPM P	PPM K	Year Sampled
Sandy Loam	64.6	18.7	16.7	7.2	0.5	1.2	4.9	451.2	2003

Soil specific normal values are described in the ecological site description (USDA-NRCS, 2011) and by Tiedeman and Lopez (2004).

*States and Transitions*

No state and transition model is available for the above ecological site, but it is likely similar to the [Semidesert Loam \(Wyoming Big Sagebrush\), R035XY209UT](#) ecological site which does have a defined state and transition model (USDA-NRCS, 2011).

Since 2003, the site has maintained a stand of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) that has dominated the site, while the understory has been comprised almost entirely of the invasive annual grass cheatgrass (*Bromus tectorum*). Since 2003, cheatgrass has been increasing in frequency and has filled in the interspaces. The perennial grass and forb community has been limited on the site and has been found in close association with browse species (Table - Browse Trends; Table - Herbaceous Trends). Repeat photography reveals that Utah juniper (*Juniperus osteosperma*) has a considerable presence near the site and the potential to encroach onto the site.

## Trend Summary

DEER DESIRABLE COMPONENTS INDEX - LOW POTENTIAL SCALE --  
Management unit 30, study no: 63

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2003	29.2	-0.9	1.5	6.9	-0.8	0.6	0.0	<b>36.4</b>	Fair
2008	20.2	9.9	2.0	5.8	-4.4	0.3	0.0	<b>33.8</b>	Fair
2013	20.2	9.9	2.0	5.8	-4.4	0.3	0.0	<b>33.8</b>	Fair

HERBACEOUS TRENDS--  
Management unit 30, Study no: 63

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
G	<i>Aristida purpurea</i>	22	18	16	.52	.13	.58
G	<i>Bromus tectorum</i> (a)	<sub>a</sub> 128	<sub>b</sub> 382	<sub>b</sub> 416	<sub>b</sub> 1.05	6.47	5.83
G	<i>Hilaria jamesii</i>	<sub>b</sub> 86	<sub>a</sub> 44	<sub>a</sub> 45	2.55	.35	.78
G	<i>Oryzopsis hymenoides</i>	9	19	14	.04	.46	.25
G	<i>Poa secunda</i>	-	3	-	-	.03	-
G	<i>Sitanion hystrix</i>	<sub>a</sub> 30	<sub>ab</sub> 68	<sub>b</sub> 73	.33	.53	1.22
G	<i>Stipa comata</i>	-	-	4	-	-	.06
G	<i>Vulpia octoflora</i> (a)	<sub>a</sub> 4	<sub>b</sub> 27	<sub>a</sub> 1	.00	.20	.03
Total for Annual Grasses		132	409	417	1.06	6.67	5.86
Total for Perennial Grasses		147	152	152	3.45	1.52	2.89
Total for Grasses		279	561	569	4.51	8.19	8.75
F	<i>Alyssum alyssoides</i> (a)	<sub>a</sub> -	<sub>a</sub> 2	<sub>b</sub> 18	-	.01	.06
F	<i>Astragalus</i> sp.	-	6	-	-	.01	-
F	<i>Calochortus nuttallii</i>	<sub>a</sub> 8	<sub>b</sub> 22	<sub>a</sub> -	.02	.09	-
F	<i>Castilleja linariaefolia</i>	-	4	-	-	.01	-
F	<i>Collinsia parviflora</i> (a)	-	-	3	-	-	.00
F	<i>Cryptantha</i> sp.(a)	<sub>a</sub> -	<sub>b</sub> 15	<sub>a</sub> -	-	.03	-
F	<i>Cymopterus</i> sp.	10	2	5	.04	.01	.01
F	<i>Epilobium brachycarpum</i> (a)	-	3	-	-	.00	-
F	<i>Eriastrum sparsiflorum</i> (a)	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 12	-	-	.03
F	<i>Eriogonum ovalifolium</i>	-	4	-	-	.01	-
F	<i>Eriogonum</i> sp.	-	4	-	-	.00	-
F	<i>Euphorbia</i> sp.	5	4	-	.03	.01	-
F	<i>Gilia</i> sp. (a)	<sub>b</sub> 66	<sub>a</sub> 9	<sub>a</sub> 6	.68	.02	.01
F	<i>Leucelene ericoides</i>	5	5	4	.15	.38	.15
F	<i>Navarretia intertexta</i> (a)	<sub>b</sub> 88	<sub>b</sub> 89	<sub>a</sub> 1	.84	.17	.00
F	<i>Penstemon</i> sp.	1	-	-	.03	-	-
F	<i>Phlox longifolia</i>	1	4	-	.00	.01	-
F	<i>Sedum lanceolatum</i>	-	3	-	-	.00	-
F	<i>Sisymbrium altissimum</i> (a)	-	5	-	-	.01	-
Total for Annual Forbs		154	123	40	1.52	0.26	0.11

Type	Species	Nested Frequency			Average Cover %		
		'03	'08	'13	'03	'08	'13
	Total for Perennial Forbs	30	58	9	0.28	0.55	0.16
	Total for Forbs	184	181	49	1.81	0.81	0.28

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

#### BROWSE TRENDS--

Management unit 30, Study no: 63

Type	Species	Quadrat Cover %			Line Intercept Cover %		
		'03	'08	'13	'03	'08	'13
B	Amelanchier utahensis	.38	-	-	-	-	-
B	Artemisia tridentata wyomingensis	22.93	17.67	16.18	18.48	22.65	22.76
B	Juniperus osteosperma	-	-	.03	-	-	2.13
B	Opuntia echinocarpa	.38	-	-	.61	-	-
B	Polygala subspinoso subspinoso	.06	.01	.00	-	-	-
	Total for Browse	23.75	17.68	16.21	19.09	22.65	24.89

#### BASIC COVER--

Management unit 30, Study no: 63

Cover Type	Average Cover %		
	'03	'08	'13
Vegetation	31.81	25.13	29.34
Rock	4.84	4.49	2.67
Pavement	24.14	21.16	10.93
Litter	41.40	54.59	60.18
Cryptogams	.18	1.11	.47
Bare Ground	11.53	10.15	12.20

#### PELLET GROUP DATA--

Management unit 30, Study no: 63

Type	Quadrat Frequency		
	'03	'08	'13
Rabbit	26	87	17
Deer	8	11	1
Cattle	-	-	-

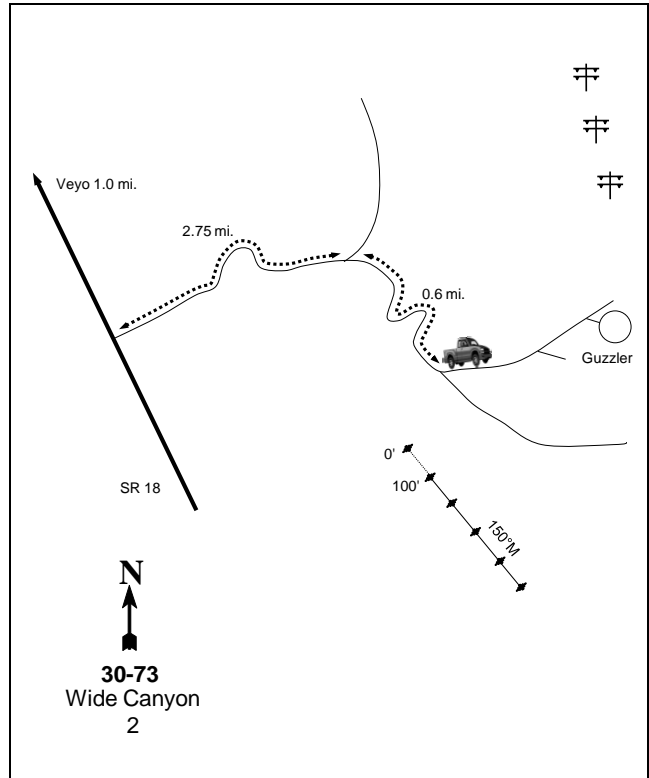
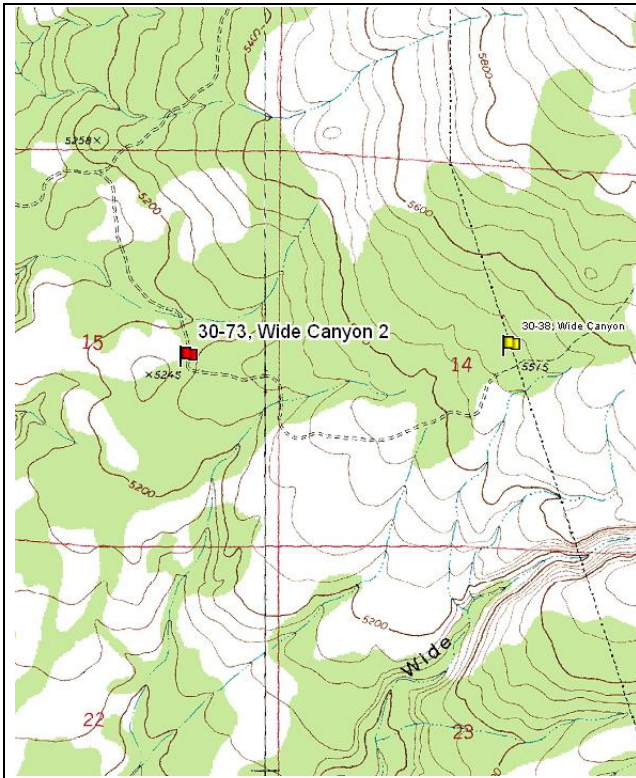
Days use per acre (ha)		
'03	'08	'13
-	-	-
11 (26)	13 (31)	3 (7)
-	2 (4)	-

BROWSE CHARACTERISTICS--  
Management unit 30, Study no: 63

		Age class distribution					Utilization			
Year	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)	
<i>Artemisia tridentata wyomingensis</i>										
03	<b>3080</b>	3	43	54	-	33	3	16	28/37	
08	<b>2880</b>	0	40	60	20	17	8	30	28/39	
13	<b>2760</b>	4	80	17	40	7	0	18	28/39	
<i>Opuntia echinocarpa</i>										
03	<b>20</b>	0	100	-	-	0	0	0	-/-	
08	<b>0</b>	0	0	-	-	0	0	0	-/-	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	
<i>Polygala subspinoso subspinoso</i>										
03	<b>100</b>	0	100	-	-	0	0	0	3/5	
08	<b>0</b>	0	0	-	-	0	0	0	5/4	
13	<b>40</b>	0	100	-	20	0	0	0	3/4	
<i>Purshia tridentata</i>										
03	<b>0</b>	0	0	-	-	0	0	0	48/65	
08	<b>0</b>	0	0	-	-	0	0	0	36/45	
13	<b>0</b>	0	0	-	-	0	0	0	-/-	



WIDE CANYON 2 - TREND STUDY NO. 30-73



**Location Information**

USGS 7.5 min Map Info  
GPS (0' Stake)

Veyo; Township 40S, Range 16W, Section 15  
NAD 83, UTM Zone 12, 266920 East 4132227 North

**Transect Information**

Browse Tag # (0' Stake)  
Transect Bearing  
Length  
Belt Placement  
Belt Marker Placement

158  
150° magnetic  
500ft  
Line 1 (11ft), Line 2 (34ft), Line 3 (59ft), Line 4 (71ft), Line 5 (95ft)  
Standard

**Directions to Site**

From the town of Veyo at the intersection of Hwy 18 and Center Street, proceed south 3.8 miles, at which point a road takes off to the east. Proceed east on this road for approximately 2.75 miles to a fork in the road. Take the right fork for an additional 0.6 miles and park at the intersection. At this point there is a road going north. The 0-foot stake is identified by browse tag number 158. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. Line 3 is only 90 feet long.

**Site Information**

Land Ownership BLM  
 Allotment Veyo  
 Elevation 5,249ft (1,600m)  
 Aspect North  
 Slope 2%  
 Sample Dates 05/21/2013

**Habitat and Vegetation Information**

Wildlife Habitat Deer, Crucial Winter

VEGETATION HISTORY--

Management unit 30, Study no: 73

Year	Vegetation Type <sup>1</sup>	Woodland Succession <sup>2</sup>
2013	Mountain Big Sagebrush/Pinyon-Juniper	Phase I transitioning to Phase II

<sup>1</sup>Vegetation Type (Appendix A - Vegetation Type), <sup>2</sup>Woodland Succession (Tausch, Miller, Roundy, & Chambers, 2009).

**Site Notes**

This site replaces the suspended site Wide Canyon (30-38), which was burned and lost much of its sagebrush during the Dammeron fires in 2005 and 2007. Deer pellet groups were sampled in moderate abundance in 2013 (Table - Pellet Group Data). When sampled in 2013 perennial grasses were found sheltered within the browse component, while the invasive annual grass cheatgrass (*Bromus tectorum*) was found out in the interspaces. Soil analysis data was not sampled.

**Site Potential**

1981-2010 Average Annual Precipitation 15 inches  
 NRCS Taxonomical soil Classification Clayey, montmorillonitic, mesic, shallow Petrocalcic Paleustolls  
 NRCS Ecological Site Upland Shallow Loam (Mountain Big Sagebrush)  
 NRCS Ecological Site # R047XB322UT

*States and Transitions*

No state and transition model is available for the above ecological site.

When established in 2013, the site was a stand of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with a prominent stand of Utah juniper (*Juniperus osteosperma*) scattered throughout the site. The herbaceous component was dominated by the invasive annual grass cheatgrass. With both cheatgrass and Utah juniper on the site, there is a high potential for fire to remove much of the beneficial browse species on the site. Additionally, due to wildfire having removed much of the surrounding preferred browse species the area has become more valuable to wildlife as it maintains much of the areas mature sagebrush stands.

**Trend Summary**

DEER DESIRABLE COMPONENTS INDEX - MID POTENTIAL SCALE --  
 Management unit 30, study no: 73

Year	Preferred Browse Cover	Preferred Browse Decadence	Preferred Browse Young	Perennial Grass Cover	Annual Grass Cover	Perennial Forb Cover	Noxious Weeds	Total Score	Ranking
2013	7.6	9.6	5.5	1.4	-7.5	0.8	0.0	17.4	Very Poor

HERBACEOUS TRENDS--

Management unit 30, Study no: 73

Type	Species	Nested	Average
		Frequency	Cover %
		'13	'13
G	Agropyron cristatum	4	.00
G	Bromus rubens (a)	6	.06
G	Bromus tectorum (a)	361	9.64
G	Hilaria jamesii	7	.33
G	Oryzopsis hymenoides	2	.03
G	Poa secunda	4	.06
G	Sitanion hystrix	35	.27
G	Vulpia octoflora (a)	81	.31
Total for Annual Grasses		448	10.01
Total for Perennial Grasses		52	0.70
Total for Grasses		500	10.72
F	Draba sp. (a)	9	.04
F	Erodium cicutarium (a)	110	.88
F	Lithospermum incisum	4	.03
F	Microsteris gracilis (a)	209	.53
F	Ranunculus testiculatus (a)	18	.03
F	Sisymbrium altissimum (a)	1	.00
F	Sphaeralcea grossulariifolia	54	.36
Total for Annual Forbs		347	1.50
Total for Perennial Forbs		58	0.40
Total for Forbs		405	1.91

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

BROWSE TRENDS--

Management unit 30, Study no: 73

Type	Species	Quadrat	Line
		Cover %	Intercept
		'13	'13
B	Artemisia tridentata vaseyana	6.10	6.63
B	Chrysothamnus viscidiflorus viscidiflorus	.53	.78
B	Ephedra viridis	.00	.98
B	Gutierrezia sarothrae	1.97	1.55
B	Juniperus osteosperma	3.19	3.21
Total for Browse		11.81	13.15

POINT-QUARTER TREE DATA--  
Management unit 30, Study no: 73

Species	Trees per Acre	Average diameter (in)
	'13	'13
Juniperus osteosperma	35	8.6

BASIC COVER--  
Management unit 30, Study no: 73

Cover Type	Average Cover %
	'13
Vegetation	26.21
Rock	13.25
Pavement	8.67
Litter	40.17
Cryptogams	.24
Bare Ground	21.10

PELLET GROUP DATA--  
Management unit 30, Study no: 73

Type	Quadrat Frequency	Days use per acre (ha)
	'13	'13
Rabbit	25	-
Deer	26	25 (61)
Cattle	1	3 (7)

BROWSE CHARACTERISTICS--  
Management unit 30, Study no: 73

Year	Plants per Acre (excluding seedlings)	Age class distribution			Seedling (plants/acre)	Utilization			Average Height Crown (in)	
		% Young	% Mature	% Decadent		% moderate	% heavy	% poor vigor		
Artemisia nova										
13	20	0	100	-	-	0	0	0	8/18	
Artemisia tridentata vaseyana										
13	1660	11	71	18	40	59	28	8	17/25	
Chrysothamnus viscidiflorus viscidiflorus										
13	160	0	63	38	-	0	0	38	17/29	
Cowania mexicana stansburiana										
13	0	0	0	-	20	0	0	0	35/35	
Ephedra viridis										
13	120	50	33	17	-	0	0	17	39/57	
Gutierrezia sarothrae										
13	3320	15	77	8	80	0	.60	7	5/8	

		Age class distribution						Utilization	
Y e a r	Plants per Acre (excluding seedlings)	% Young	% Mature	% Decadent	Seedling (plants/acre)	% moderate	% heavy	% poor vigor	Average Height Crown (in)
Juniperus osteosperma									
13	<b>40</b>	50	50	-	20	0	0	0	-/-
Opuntia whipplei									
13	<b>0</b>	0	0	-	-	0	0	0	19/36

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## APPENDIX A - VEGETATION TYPE

### VEGETATION COMMUNITY TYPE CLASSIFICATION--

Vegetation Type Code	Vegetation Community Type Name*	Description
ANN GRASS	Annual Grass	Annual grasses provide the dominant vegetation cover.
PER GRASS	Perennial Grass	Perennial grasses provide the dominant vegetation cover.
ANN-PER GRASS	Annual-Perennial Grass	Mixture of Annual and Perennial grass species provide the dominant vegetation cover.
ANN GRASS-FORB	Annual Grass-Forb	Mixture of Annual grass and forb species provide the dominant vegetation cover.
PER GRASS-FORB	Perennial Grass-Forb	Mixture of Perennial grass and forb species provide the dominant vegetation cover.
ANN FORB	Annual Forb	Annual forbs provide the dominant vegetation cover
PER FORB	Perennial Forb	Perennial forbs provide the dominant vegetation cover
ANN-PER FORB	Annual-Perennial Forb	Mixture of Annual and Perennial forb species provide the dominant vegetation cover.
WEED	Annual-Perennial Weed	Annual and/or Perennial weedy species provide the dominant vegetation cover.
WET MEADOW	Wet Meadow	Riparian vegetation species provide the dominant vegetation cover
DRY MEADOW	Dry Meadow	High elevation subalpine meadow
RIPAR	Riparian	Riparian vegetation species provide the dominant vegetation cover.
ALP GRASS	Alpine Grass	Grass or grass-like species provide the dominant vegetation cover
ALP FORB	Alpine Forb	Forb species provide the dominant vegetation cover
ALP SHRUB	Alpine Shrub	Alpine shrub species provide the dominant vegetation cover
ALP MIX	Alpine-Mixed	Mixture of grass, forb, or shrub species provide the dominant vegetation cover
ARTRT	Basin Big Sagebrush	Major component of the site (typically >5% cover).
ARTRV	Mountain Big Sagebrush	Major component of the site (typically > 5% cover).
ARTRW	Wyoming Big Sagebrush	Major component of the site (typically >5% cover).
ARAR	Low Sagebrush	Major component of the site (typically >5% cover).
ARCA	Silver Sagebrush	Major component of the site (typically >5% cover).
ARNO	Black Sagebrush	Major component of the site (typically >5% cover).
ARSP	Bud Sagebrush	Major component of the site (typically >5% cover).
ARFR	Fringed Sagebrush	Major component of the site (typically >5% cover).
CHNA	Rubber Rabbitbrush	Major component of the site (typically >5% cover).
CHPA	Parry Rabbitbrush	Major component of the site (typically >5% cover).
CHVI	Low Rabbitbrush	Major component of the site (typically >5% cover).
GUSA	Broom Snakeweed	Major component of the site (typically >5% cover).
SAVE	Black Greasewood	Major component of the site (typically >5% cover).
CELA	Winterfat	Major component of the site (typically >5% cover).
ATCO	Shadscale	Major component of the site (typically >5% cover).
ATCA	Fourwing Saltbush	Major component of the site (typically >5% cover).
GRSP	Spiny Hopsage	Major component of the site (typically >5% cover).
MSDS	Mixed Salt Desert Shrub	Mixture of one or more Salt Desert species (ATCO, ATCA, GRSP, etc.) with no one species expressing dominance.

Vegetation Type Code	Vegetation Community Type Name*	Description
LARRE	Creosote Bush	Major component of the site (typically >5% cover).
CORA	Blackbrush	Major component of the site (typically >5% cover).
PRFA	Desert Almond	Major component of the site (typically >5% cover).
EPHED	Ephedra	Major component of the site (typically >5% cover).
QUGA	Gambel Oak	Major component of the site (typically >5% cover).
QUTU	Live Oak	Major component of the site (typically >5% cover).
SYOR	Snowberry	Major component of the site (typically >5% cover).
AMAL	Serviceberry	Major component of the site (typically >5% cover).
PUTR	Bitterbrush	Major component of the site (typically >5% cover).
PUGL	Desert Bitterbrush	Major component of the site (typically >5% cover).
ARCT2	Manzanita	Major component of the site (typically >5% cover).
CEMOM	True Mountain Mahogany	Major component of the site (typically >5% cover).
CELEL	Curleaf Mountain Mahogany	Major component of the site (typically >5% cover).
COMES	Stansbury Cliffrose	Major component of the site (typically >5% cover).
KOPR	Forage Kochia	Major component of the site (typically >5% cover).
TAMARIX	Tamarix	Major component of the site (typically >5% cover).
MMB	Mixed Mountain Brush	Mixture of one or more Mountain brush species (ARTRV, AMAL, CEMOM, etc.) with no one species expressing dominance.
MB	Mixed Shrub	Mixture of various shrub species with none expressing dominance.
CHAPARRAL	Chaparral	Mixture of fire tolerant shrub species.
JUNIPER	Juniper	Major component of the site (Phase III <sup>1</sup> ). No pinyon present.
PINYON	Pinyon	Major component of the site (Phase III <sup>1</sup> ). No juniper present.
PJ	Pinyon-Juniper	Major components of the site (Phase III <sup>1</sup> ). Pinyon and Juniper present.
POTR	Quaking Aspen	POTR provides the dominant overstory (typically >5% cover).
POTR-CE	Quaking Aspen-Conifer Encroached	Mixture of QUGA and Conifers (conifers typically provide >5% cover).
PIPO	Ponderosa Pine	PIPO provides the dominant overstory (typically >5% cover).
PSMEM	Douglas Fir	Major component of the site (typically >5% cover).
ABCO	White Fir	Major component of the site (typically >5% cover).
PIFL	Limber Pine	Major component of the site (typically >5% cover).
PICO	Lodgepole Pine	Major component of the site (typically >5% cover).
PILO	Bristlecone Pine	Major component of the site (typically >5% cover).
PIEN	Engelmann Spruce	Major component of the site (typically >5% cover).
ABLA	Subalpine Fir	Major component of the site (typically >5% cover).
SUBALP	Subalpine Forest	Mixture of PIEN and ABLA provide the dominant vegetation cover
MIX CON	Mixed Conifer Forest	Mixture of conifer tree species provide the dominant vegetation cover
AG-PAST	Agricultural-Pasture	Active or abandoned agricultural pasture
AG-CL	Agricultural-Cropland	Active or abandoned agricultural cropland

\*Vegetation types can be co-dominant on the study site and when more than one vegetation community types are co-dominant and are major components of the site a (/) is used to separate vegetation community types.

<sup>1</sup>Phase of woodland succession